OUTPUT FROM CONMAN, THE CONSTRAINT MANAGER

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Script started on Fri Oct 30 02:09:35 198
moon(1)-> prolog

Quintus Prolog Release 2.0 (Sun-3, Unix 3.3)
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| ?- [load].
Building the ConMan constraint management system...

 [driver consulted 0.517 sec 2,668 bytes]
 [select consulted 0.184 sec 820 bytes]
 [tighten consulted 1.783 sec 7,752 bytes]
 [algebra consulted 1.283 sec 5,608 bytes]
 [util consulted 1.100 sec 4,832 bytes]
 [genutil consulted 3.116 sec 13,848 bytes]
 [data consulted 0.667 sec 3,984 bytes]

[load consulted 9.217 sec 40,656 bytes]

yes
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```
| ?- conman.
------------------------------------------------------------
VALUES:
     c0          = [0,1]
     c1          = [0,1]
     c2          = [0,1]
     c3          = [0,1]
     c4          = [0,1]
     c5          = [0,1]
     d           = [0,1,2,3,4,5,6,7,8,9]
     e           = [0,1,2,3,4,5,6,7,8,9]
     m           = [0,1,2,3,4,5,6,7,8,9]
     n           = [0,1,2,3,4,5,6,7,8,9]
     o           = [0,1,2,3,4,5,6,7,8,9]
     r           = [0,1,2,3,4,5,6,7,8,9]
     s           = [0,1,2,3,4,5,6,7,8,9]
     y           = [0,1,2,3,4,5,6,7,8,9]

CONSTRAINTS:
     c0=0
     c4=[m,10*c5]
     c5=0
     [c0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,s,m]=[o,10*c4]
     [9000*m,900*o,90*n,y]=[1000*s,91*e,d,10*r]
     m\==0
     s\==0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     c2 :         c2=0->[n,r]<10
     c2 :         c2=1->[n,r]>9
     c3 :         c3=0->[e,o]<10
     c3 :         c3=1->[e,o]>9
     c4 :         c4=0->[s,m]<10
     c4 :         c4=1->[s,m]>9
------------------------------------------------------------
```

```
Selected constraint: c0=0
Tightening possibilities for: c0
Solving c0=0 for c0
c0=[0.0*1]
Constraint gives possibilities: [0]
Old possibilities were:         [0,1]
New possibilities are:          [0]
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0,1]
     c3         = [0,1]
     c4         = [0,1]
     c5         = [0,1]
     d          = [0,1,2,3,4,5,6,7,8,9]
     e          = [0,1,2,3,4,5,6,7,8,9]
     m          = [0,1,2,3,4,5,6,7,8,9]
     n          = [0,1,2,3,4,5,6,7,8,9]
     o          = [0,1,2,3,4,5,6,7,8,9]
     r          = [0,1,2,3,4,5,6,7,8,9]
     s          = [0,1,2,3,4,5,6,7,8,9]
     y          = [0,1,2,3,4,5,6,7,8,9]

CONSTRAINTS:
     c4=[m,10*c5]
     c5=0
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,s,m]=[o,10*c4]
     [9000*m,900*o,90*n,y]=[1000*s,91*e,d,10*r]
     m\==0
     s\==0

DEMONS:
     c4 :        c4=1->[s,m]>9
     c4 :        c4=0->[s,m]<10
     c3 :        c3=1->[e,o]>9
     c3 :        c3=0->[e,o]<10
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: c5=0
Tightening possibilities for: c5
Solving c5=0 for c5
c5=[0.0*1]
Constraint gives possibilities: [0]
Old possibilities were:         [0,1]
New possibilities are:          [0]
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0,1]
     c3         = [0,1]
     c4         = [0,1]
     c5         = [0]
     d          = [0,1,2,3,4,5,6,7,8,9]
     e          = [0,1,2,3,4,5,6,7,8,9]
     m          = [0,1,2,3,4,5,6,7,8,9]
     n          = [0,1,2,3,4,5,6,7,8,9]
     o          = [0,1,2,3,4,5,6,7,8,9]
     r          = [0,1,2,3,4,5,6,7,8,9]
     s          = [0,1,2,3,4,5,6,7,8,9]
     y          = [0,1,2,3,4,5,6,7,8,9]

CONSTRAINTS:
     c4=[m,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,s,m]=[o,10*c4]
     [9000*m,900*o,90*n,y]=[1000*s,91*e,d,10*r]
     m\==0
     s\==0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     c2 :        c2=0->[n,r]<10
     c2 :        c2=1->[n,r]>9
     c3 :        c3=0->[e,o]<10
     c3 :        c3=1->[e,o]>9
     c4 :        c4=0->[s,m]<10
     c4 :        c4=1->[s,m]>9
------------------------------------------------------------
```

```
Selected constraint: m\==0
Tightening possibilities for: m
Solving m\==0 for m
m\==[0.0*1]
Constraint gives possibilities: [0]
Old possibilities were:         [0,1,2,3,4,5,6,7,8,9]
New possibilities are:          [1,2,3,4,5,6,7,8,9]
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0,1]
     c3         = [0,1]
     c4         = [0,1]
     c5         = [0]
     d          = [0,1,2,3,4,5,6,7,8,9]
     e          = [0,1,2,3,4,5,6,7,8,9]
     m          = [1,2,3,4,5,6,7,8,9]
     n          = [0,1,2,3,4,5,6,7,8,9]
     o          = [0,1,2,3,4,5,6,7,8,9]
     r          = [0,1,2,3,4,5,6,7,8,9]
     s          = [0,1,2,3,4,5,6,7,8,9]
     y          = [0,1,2,3,4,5,6,7,8,9]

CONSTRAINTS:
     c4=[m,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,s,m]=[o,10*c4]
     [9000*m,900*o,90*n,y]=[1000*s,91*e,d,10*r]
     s\==0

DEMONS:
     c4 :        c4=1->[s,m]>9
     c4 :        c4=0->[s,m]<10
     c3 :        c3=1->[e,o]>9
     c3 :        c3=0->[e,o]<10
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: s\==0
Tightening possibilities for: s
Solving s\==0 for s
s\==[0.0*1]
Constraint gives possibilities: [0]
Old possibilities were:         [0,1,2,3,4,5,6,7,8,9]
New possibilities are:          [1,2,3,4,5,6,7,8,9]
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0,1]
     c3         = [0,1]
     c4         = [0,1]
     c5         = [0]
     d          = [0,1,2,3,4,5,6,7,8,9]
     e          = [0,1,2,3,4,5,6,7,8,9]
     m          = [1,2,3,4,5,6,7,8,9]
     n          = [0,1,2,3,4,5,6,7,8,9]
     o          = [0,1,2,3,4,5,6,7,8,9]
     r          = [0,1,2,3,4,5,6,7,8,9]
     s          = [1,2,3,4,5,6,7,8,9]
     y          = [0,1,2,3,4,5,6,7,8,9]

CONSTRAINTS:
     c4=[m,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,s,m]=[o,10*c4]
     [9000*m,900*o,90*n,y]=[1000*s,91*e,d,10*r]

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     c2 :        c2=0->[n,r]<10
     c2 :        c2=1->[n,r]>9
     c3 :        c3=0->[e,o]<10
     c3 :        c3=1->[e,o]>9
     c4 :        c4=0->[s,m]<10
     c4 :        c4=1->[s,m]>9
------------------------------------------------------------
```

```
Selected constraint: c4=[m,10*0]
Tightening possibilities for: c4
Solving c4=[m,10*0] for c4
c4=[1.0*m,0.0*1]
Constraint gives possibilities: [1,2,3,4,5,6,7,8,9]
Old possibilities were:         [0,1]
New possibilities are:          [1]
Values have changed. Checking demons
Moving demon to constraint list: 1=0->[s,m]<10
Moving demon to constraint list: 1=1->[s,m]>9
Tightening possibilities for: m
Solving c4=[m,10*0] for m
m=[0.0*1,1.0*c4]
Constraint gives possibilities: [1]
Old possibilities were:         [1,2,3,4,5,6,7,8,9]
New possibilities are:          [1]
m is now unique. Removing its value 1 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     y          = [0,2,3,4,5,6,7,8,9]
     s          = [2,3,4,5,6,7,8,9]
     r          = [0,2,3,4,5,6,7,8,9]
     o          = [0,2,3,4,5,6,7,8,9]
     n          = [0,2,3,4,5,6,7,8,9]
     m          = [1]
     e          = [0,2,3,4,5,6,7,8,9]
     d          = [0,2,3,4,5,6,7,8,9]
     c5         = [0]
     c4         = [1]
     c3         = [0,1]
     c2         = [0,1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     1=1->[s,1]>9
     1=0->[s,1]<10
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,s,1]=[o,10*1]
     [9000*1,900*o,90*n,y]=[1000*s,91*e,d,10*r]

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     c2 :        c2=0->[n,r]<10
```

```
     c2 :         c2=1->[n,r]>9
     c3 :         c3=0->[e,o]<10
     c3 :         c3=1->[e,o]>9
-------------------------------------------------------------
```

```
Selected constraint: 1=1->[s,1]>9
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: s
Solving [s,1]>9 for s
s>[8.0*1]
Constraint gives possibilities: [8]
Old possibilities were:         [2,3,4,5,6,7,8,9]
New possibilities are:          [9]
s is now unique. Removing its value 9 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0,1]
     c3         = [0,1]
     c4         = [1]
     c5         = [0]
     d          = [0,2,3,4,5,6,7,8]
     e          = [0,2,3,4,5,6,7,8]
     m          = [1]
     n          = [0,2,3,4,5,6,7,8]
     o          = [0,2,3,4,5,6,7,8]
     r          = [0,2,3,4,5,6,7,8]
     s          = [9]
     y          = [0,2,3,4,5,6,7,8]

CONSTRAINTS:
     1=0->[9,1]<10
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,9,1]=[o,10*1]
     [9000*1,900*o,90*n,y]=[1000*9,91*e,d,10*r]

DEMONS:
     c3 :        c3=1->[e,o]>9
     c3 :        c3=0->[e,o]<10
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: 1=0->[9,1]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0,1]
     c3         = [0,1]
     c4         = [1]
     c5         = [0]
     d          = [0,2,3,4,5,6,7,8]
     e          = [0,2,3,4,5,6,7,8]
     m          = [1]
     n          = [0,2,3,4,5,6,7,8]
     o          = [0,2,3,4,5,6,7,8]
     r          = [0,2,3,4,5,6,7,8]
     s          = [9]
     y          = [0,2,3,4,5,6,7,8]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,o]=[n,10*c3]
     [c3,9,1]=[o,10*1]
     [9000*1,900*o,90*n,y]=[1000*9,91*e,d,10*r]

DEMONS:
     c3 :        c3=1->[e,o]>9
     c3 :        c3=0->[e,o]<10
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [c3,9,1]=[o,10*1]
Tightening possibilities for: c3
Solving [c3,9,1]=[o,10*1] for c3
c3=[1.0*o,0.0*1]
Constraint gives possibilities: [0,2,3,4,5,6,7,8]
Old possibilities were:         [0,1]
New possibilities are:          [0]
Values have changed. Checking demons
Moving demon to constraint list: 0=1->[e,o]>9
Moving demon to constraint list: 0=0->[e,o]<10
Tightening possibilities for: o
Solving [c3,9,1]=[o,10*1] for o
o=[0.0*1,1.0*c3]
Constraint gives possibilities: [0]
Old possibilities were:         [0,2,3,4,5,6,7,8]
New possibilities are:          [0]
o is now unique. Removing its value 0 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0,1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     0=0->[e,0]<10
     0=1->[e,0]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,0]=[n,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]

DEMONS:
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
```

```
Selected constraint: 0=0->[e,0]<10
Evaluating equation: 0=0
Evaluates true
Tightening possibilities for: e
Solving [e,0]<10 for e
e<[10.0*1]
Constraint gives possibilities: [10]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0,1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     0=1->[e,0]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,0]=[n,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]

DEMONS:
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: 0=1->[e,0]>9
Evaluating equation: 0=1
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0,1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [c2,e,0]=[n,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]

DEMONS:
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [c2,e,0]=[n,10*0]
Tightening possibilities for: c2
Solving [c2,e,0]=[n,10*0] for c2
c2=[1.0*n,0.0*1,-1.0*e]
Constraint gives possibilities: [-6,-5,-4,-3,-2,-1,0,1,2,3,4,5,6]
Old possibilities were:         [0,1]
New possibilities are:          [0,1]
Tightening possibilities for: e
Solving [c2,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1,-1.0*c2]
Constraint gives possibilities: [1,2,3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
Tightening possibilities for: n
Solving [c2,e,0]=[n,10*0] for n
n=[0.0*1,1.0*c2,1.0*e]
Constraint gives possibilities: [2,3,4,5,6,7,8,9]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
Constraint: [c2,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,e,0]=[n,10*0] for 0
Made new conditional constraint: c2=0->[-1*n,0*1,1*e]=0
Solving [1,e,0]=[n,10*0] for 0
Made new conditional constraint: c2=1->[-1*n,1*1,1*e]=0
Made new demons:
[[c2,[c2,e,0]=[n,10*0]],[e,[c2,e,0]=[n,10*0]],[n,[c2,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0,1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     c2=0->[-1*n,0*1,1*e]=0
```

```
     c2=1->[-1*n,1*1,1*e]=0

DEMONS:
     c2 :         c2=1->[n,r]>9
     c2 :         c2=0->[n,r]<10
     c1 :         c1=1->[d,e]>9
     c1 :         c1=0->[d,e]<10
     c2 :         [c2,e,0]=[n,10*0]
     e :          [c2,e,0]=[n,10*0]
     n :          [c2,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: c2=0->[-1*n,0*1,1*e]=0
Tightening possibilities for: c2
Solving c2=0 for c2
c2=[0.0*1]
Constraint gives possibilities: [0]
Old possibilities were:         [0,1]
New possibilities are:          [0]
Values have changed. Checking demons
Moving demon to constraint list: 0=1->[n,r]>9
Moving demon to constraint list: 0=0->[n,r]<10
Moving demon to constraint list: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [-1*n,0*1,1*e]=0 for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [2,3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
Tightening possibilities for: n
Solving [-1*n,0*1,1*e]=0 for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [2,3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     0=0->[n,r]<10
     0=1->[n,r]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     0=1->[-1*n,1*1,1*e]=0
```

```
DEMONS:
     n :          [0,e,0]=[n,10*0]
     e :          [0,e,0]=[n,10*0]
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [2,3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [2,3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7,8]
Constraint: [0,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,2,0]=[n,10*0] for 0
Made new conditional constraint: e=2->[-1*n,2*1]=0
Solving [0,3,0]=[n,10*0] for 0
Made new conditional constraint: e=3->[-1*n,3*1]=0
Solving [0,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,4*1]=0
Solving [0,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,5*1]=0
Solving [0,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,6*1]=0
Solving [0,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,7*1]=0
Solving [0,8,0]=[n,10*0] for 0
Made new conditional constraint: e=8->[-1*n,8*1]=0
Made new demons: [[e,[0,e,0]=[n,10*0]],[n,[0,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     0=0->[n,r]<10
```

```
     0=1->[n,r]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     0=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,2*1]=0
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: 0=0->[n,r]<10
Evaluating equation: 0=0
Evaluates true
Tightening possibilities for: n
Solving [n,r]<10 for n
n<[10.0*1,-1.0*r]
Constraint gives possibilities: [2,3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     0=1->[n,r]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     0=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,2*1]=0
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
     n :         [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: 0=1->[n,r]>9
Evaluating equation: 0=1
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     0=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,2*1]=0
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
     n :         [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: 0=1->[-1*n,1*1,1*e]=0
Evaluating equation: 0=1
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=2->[-1*n,2*1]=0
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
     n :         [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e=2->[-1*n,2*1]=0
Tightening possibilities for: e
Solving e=2 for e
e=[2.0*1]
Constraint gives possibilities: [2]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2]
e is now unique. Removing its value 2 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,2,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,2*1]=0 for n
n=[2.0*1]
Constraint gives possibilities: [2]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==2
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==2
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
```

```
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: e\==2
Tightening possibilities for: e
Solving e\==2 for e
e\==[2.0*1]
Constraint gives possibilities: [2]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     n :         [0,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [2,3,4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Constraint: [0,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,3,0]=[n,10*0] for 0
Made new conditional constraint: e=3->[-1*n,3*1]=0
Solving [0,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,4*1]=0
Solving [0,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,5*1]=0
Solving [0,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,6*1]=0
Solving [0,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,7*1]=0
Solving [0,8,0]=[n,10*0] for 0
Made new conditional constraint: e=8->[-1*n,8*1]=0
Made new demons: [[e,[0,e,0]=[n,10*0]],[n,[0,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
```

```
     e=3->[-1*n,3*1]=0
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e=3->[-1*n,3*1]=0
Tightening possibilities for: e
Solving e=3 for e
e=[3.0*1]
Constraint gives possibilities: [3]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3]
e is now unique. Removing its value 3 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,3,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,3*1]=0 for n
n=[3.0*1]
Constraint gives possibilities: [3]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==3
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==3
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
```

```
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: e\==3
Tightening possibilities for: e
Solving e\==3 for e
e\==[3.0*1]
Constraint gives possibilities: [3]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     n :         [0,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [4,5,6,7,8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [4,5,6,7,8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Constraint: [0,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,4*1]=0
Solving [0,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,5*1]=0
Solving [0,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,6*1]=0
Solving [0,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,7*1]=0
Solving [0,8,0]=[n,10*0] for 0
Made new conditional constraint: e=8->[-1*n,8*1]=0
Made new demons: [[e,[0,e,0]=[n,10*0]],[n,[0,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,4*1]=0
     e=5->[-1*n,5*1]=0
```

```
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e=4->[-1*n,4*1]=0
Tightening possibilities for: e
Solving e=4 for e
e=[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [4]
e is now unique. Removing its value 4 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,4,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,4*1]=0 for n
n=[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [5,6,7,8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==4
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==4
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
```

```
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: e\==4
Tightening possibilities for: e
Solving e\==4 for e
e\==[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     n :         [0,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [4,5,6,7,8]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [5,6,7,8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [5,6,7,8]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [5,6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [5,6,7,8]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [5,6,7,8]
Constraint: [0,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,5*1]=0
Solving [0,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,6*1]=0
Solving [0,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,7*1]=0
Solving [0,8,0]=[n,10*0] for 0
Made new conditional constraint: e=8->[-1*n,8*1]=0
Made new demons: [[e,[0,e,0]=[n,10*0]],[n,[0,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,5*1]=0
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0
```

```
DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e=5->[-1*n,5*1]=0
Tightening possibilities for: e
Solving e=5 for e
e=[5.0*1]
Constraint gives possibilities: [5]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [5]
e is now unique. Removing its value 5 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,5,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,5*1]=0 for n
n=[5.0*1]
Constraint gives possibilities: [5]
Old possibilities were:         [6,7,8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==5
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==5
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
```

```
     n :          [0,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: e\==5
Tightening possibilities for: e
Solving e\==5 for e
e\==[5.0*1]
Constraint gives possibilities: [5]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     n :         [0,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [5,6,7,8]
Old possibilities were:         [6,7,8]
New possibilities are:          [6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [6,7,8]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [6,7,8]
     m          = [1]
     e          = [6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [6,7,8]
Old possibilities were:         [6,7,8]
New possibilities are:          [6,7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [6,7,8]
Old possibilities were:         [6,7,8]
New possibilities are:          [6,7,8]
Constraint: [0,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,6*1]=0
Solving [0,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,7*1]=0
Solving [0,8,0]=[n,10*0] for 0
Made new conditional constraint: e=8->[-1*n,8*1]=0
Made new demons: [[e,[0,e,0]=[n,10*0]],[n,[0,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [6,7,8]
     m          = [1]
     e          = [6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=6->[-1*n,6*1]=0
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
```

```
     c1 :         c1=1->[d,e]>9
     e :          [0,e,0]=[n,10*0]
     n :          [0,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: e=6->[-1*n,6*1]=0
Tightening possibilities for: e
Solving e=6 for e
e=[6.0*1]
Constraint gives possibilities: [6]
Old possibilities were:         [6,7,8]
New possibilities are:          [6]
e is now unique. Removing its value 6 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,6,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,6*1]=0 for n
n=[6.0*1]
Constraint gives possibilities: [6]
Old possibilities were:         [7,8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==6
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [6,7,8]
     m          = [1]
     e          = [6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==6
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
     n :         [0,e,0]=[n,10*0]
```

```
Selected constraint: e\==6
Tightening possibilities for: e
Solving e\==6 for e
e\==[6.0*1]
Constraint gives possibilities: [6]
Old possibilities were:         [6,7,8]
New possibilities are:          [7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [6,7,8]
     m          = [1]
     e          = [7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     n :         [0,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [6,7,8]
Old possibilities were:         [7,8]
New possibilities are:          [7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [7,8]
Old possibilities were:         [6,7,8]
New possibilities are:          [7,8]
Values have changed. Checking demons
Moving demon to constraint list: [0,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [7,8]
     m          = [1]
     e          = [7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [0,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [0,e,0]=[n,10*0] for e
e=[1.0*n,0.0*1]
Constraint gives possibilities: [7,8]
Old possibilities were:         [7,8]
New possibilities are:          [7,8]
Tightening possibilities for: n
Solving [0,e,0]=[n,10*0] for n
n=[0.0*1,1.0*e]
Constraint gives possibilities: [7,8]
Old possibilities were:         [7,8]
New possibilities are:          [7,8]
Constraint: [0,e,0]=[n,10*0] caused no change. Making conditionals
Solving [0,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,7*1]=0
Solving [0,8,0]=[n,10*0] for 0
Made new conditional constraint: e=8->[-1*n,8*1]=0
Made new demons: [[e,[0,e,0]=[n,10*0]],[n,[0,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [7,8]
     m          = [1]
     e          = [7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=7->[-1*n,7*1]=0
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
     n :         [0,e,0]=[n,10*0]
```

```
Selected constraint: e=7->[-1*n,7*1]=0
Tightening possibilities for: e
Solving e=7 for e
e=[7.0*1]
Constraint gives possibilities: [7]
Old possibilities were:         [7,8]
New possibilities are:          [7]
e is now unique. Removing its value 7 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,7,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,7*1]=0 for n
n=[7.0*1]
Constraint gives possibilities: [7]
Old possibilities were:         [8]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==7
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [7,8]
     m          = [1]
     e          = [7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==7
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=8->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [0,e,0]=[n,10*0]
     n :         [0,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e\==7
Tightening possibilities for: e
Solving e\==7 for e
e\==[7.0*1]
Constraint gives possibilities: [7]
Old possibilities were:         [7,8]
New possibilities are:          [8]
e is now unique. Removing its value 8 from others
Values have changed. Checking demons
Moving demon to constraint list: [0,8,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [0]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,3,4,5,6,7]
     e          = [8]
     m          = [1]
     n          = [7]
     o          = [0]
     r          = [2,3,4,5,6,7]
     s          = [9]
     y          = [2,3,4,5,6,7]

CONSTRAINTS:
     [0,8,0]=[n,10*0]
     [0,d,8]=[y,10*c1]
     [c1,n,r]=[8,10*0]
     [9000*1,900*0,90*n,y]=[1000*9,91*8,d,10*r]
     8=8->[-1*n,8*1]=0

DEMONS:
     n :         [0,8,0]=[n,10*0]
     c1 :        c1=1->[d,8]>9
     c1 :        c1=0->[d,8]<10
------------------------------------------------------------
```

```
Selected constraint: [0,8,0]=[n,10*0]
Tightening possibilities for: n
Solving [0,8,0]=[n,10*0] for n
n=[8.0*1]
Constraint gives possibilities: [8]
Old possibilities were:         [7]
New possibilities are:          []
OVERCONSTRAINT: n has no values. Backtracking.
Conditional constraint failed, asserting negation: c2\==0
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [0,1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     c2\==0
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*c2]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     c2=1->[-1*n,1*1,1*e]=0

DEMONS:
     c2 :        c2=1->[n,r]>9
     c2 :        c2=0->[n,r]<10
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
     c2 :        [c2,e,0]=[n,10*0]
     e :         [c2,e,0]=[n,10*0]
     n :         [c2,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: c2\==0
Tightening possibilities for: c2
Solving c2\==0 for c2
c2\==[0.0*1]
Constraint gives possibilities: [0]
Old possibilities were:         [0,1]
New possibilities are:          [1]
Values have changed. Checking demons
Moving demon to constraint list: 1=1->[n,r]>9
Moving demon to constraint list: 1=0->[n,r]<10
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [2,3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7,8]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     1=0->[n,r]<10
     1=1->[n,r]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*n,1*1,1*e]=0

DEMONS:
     n :         [1,e,0]=[n,10*0]
     e :         [1,e,0]=[n,10*0]
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [1,2,3,4,5,6,7]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [2,3,4,5,6,7]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [2,3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [1,e,0]=[n,10*0]
     1=0->[n,r]<10
     1=1->[n,r]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*n,1*1,1*e]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [2,3,4,5,6,7]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [2,3,4,5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Constraint: [1,e,0]=[n,10*0] caused no change. Making conditionals
Solving [1,2,0]=[n,10*0] for 0
Made new conditional constraint: e=2->[-1*n,3*1]=0
Solving [1,3,0]=[n,10*0] for 0
Made new conditional constraint: e=3->[-1*n,4*1]=0
Solving [1,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,5*1]=0
Solving [1,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,6*1]=0
Solving [1,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,7*1]=0
Solving [1,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,8*1]=0
Made new demons: [[e,[1,e,0]=[n,10*0]],[n,[1,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     1=0->[n,r]<10
     1=1->[n,r]>9
```

```
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,3*1]=0
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [1,e,0]=[n,10*0]
     n :          [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [2,3,4,5,6,7]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [2,3,4,5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
Constraint: [1,e,0]=[n,10*0] caused no change. Making conditionals
Solving [1,2,0]=[n,10*0] for 0
Made new conditional constraint: e=2->[-1*n,3*1]=0
Solving [1,3,0]=[n,10*0] for 0
Made new conditional constraint: e=3->[-1*n,4*1]=0
Solving [1,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,5*1]=0
Solving [1,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,6*1]=0
Solving [1,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,7*1]=0
Solving [1,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,8*1]=0
Made new demons: [[e,[1,e,0]=[n,10*0]],[n,[1,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     1=0->[n,r]<10
     1=1->[n,r]>9
     [0,d,e]=[y,10*c1]
```

```
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,3*1]=0
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [1,e,0]=[n,10*0]
     n :          [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: 1=0->[n,r]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     1=1->[n,r]>9
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,3*1]=0
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [1,e,0]=[n,10*0]
     n :         [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: 1=1->[n,r]>9
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: n
Solving [n,r]>9 for n
n>[9.0*1,-1.0*r]
Constraint gives possibilities: [1,2,3,4,5,6,7]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [8]
n is now unique. Removing its value 8 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[8,10*0]
Tightening possibilities for: r
Solving [n,r]>9 for r
r>[9.0*1,-1.0*n]
Constraint gives possibilities: [1]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [2,3,4,5,6,7]
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [0,1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,3,4,5,6,7]
     e          = [2,3,4,5,6,7]
     m          = [1]
     n          = [8]
     o          = [0]
     r          = [2,3,4,5,6,7]
     s          = [9]
     y          = [2,3,4,5,6,7]

CONSTRAINTS:
     [1,e,0]=[8,10*0]
     [0,d,e]=[y,10*c1]
     [c1,8,r]=[e,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*8,1*1,1*e]=0
     e=2->[-1*8,3*1]=0
     e=3->[-1*8,4*1]=0
     e=4->[-1*8,5*1]=0
     e=5->[-1*8,6*1]=0
     e=6->[-1*8,7*1]=0
     e=7->[-1*8,8*1]=0
```

```
DEMONS:
     e :          [1,e,0]=[8,10*0]
     c1 :         c1=1->[d,e]>9
     c1 :         c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[8,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[8,10*0] for e
e=[7.0*1]
Constraint gives possibilities: [7]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [7]
e is now unique. Removing its value 7 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,7,0]=[8,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,7,0]=[8,10*0]
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     1=1->[-1*8,1*1,1*7]=0
     7=2->[-1*8,3*1]=0
     7=3->[-1*8,4*1]=0
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: [1,7,0]=[8,10*0]
Evaluating equation: [1,7,0]=[8,10*0]
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     1=1->[-1*8,1*1,1*7]=0
     7=2->[-1*8,3*1]=0
     7=3->[-1*8,4*1]=0
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 1=1->[-1*8,1*1,1*7]=0
Evaluating equation: 1=1
Evaluates true
Evaluating equation: [-1*8,1*1,1*7]=0
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=2->[-1*8,3*1]=0
     7=3->[-1*8,4*1]=0
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=2->[-1*8,3*1]=0
Evaluating equation: 7=2
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=3->[-1*8,4*1]=0
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=3->[-1*8,4*1]=0
Evaluating equation: 7=3
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------


Selected constraint: 7=4->[-1*8,5*1]=0
Evaluating equation: 7=4
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
```

```
     c5          = [0]
     c4          = [1]
     c3          = [0]
     c2          = [1]
     c1          = [0,1]
     c0          = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :         c1=0->[d,7]<10
     c1 :         c1=1->[d,7]>9
-------------------------------------------------------------
```

```
Selected constraint: 7=5->[-1*8,6*1]=0
Evaluating equation: 7=5
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=6->[-1*8,7*1]=0
Evaluating equation: 7=6
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------


Selected constraint: 7=7->[-1*8,8*1]=0
Evaluating equation: 7=7
Evaluates true
Evaluating equation: [-1*8,8*1]=0
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
```

```
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
-------------------------------------------------------------
```

```
Selected constraint: [c1,8,r]=[7,10*1]
Tightening possibilities for: c1
Solving [c1,8,r]=[7,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [3,4,5,6,7]
Old possibilities were:         [0,1]
New possibilities are:          []
OVERCONSTRAINT: c1 has no values. Backtracking.
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,8,r]=[7,10*1]
Tightening possibilities for: c1
Solving [c1,8,r]=[7,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [3,4,5,6,7]
Old possibilities were:         [0,1]
New possibilities are:          []
OVERCONSTRAINT: c1 has no values. Backtracking.
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=2->[-1*8,3*1]=0
     7=3->[-1*8,4*1]=0
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=2->[-1*8,3*1]=0
Evaluating equation: 7=2
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=3->[-1*8,4*1]=0
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=3->[-1*8,4*1]=0
Evaluating equation: 7=3
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=4->[-1*8,5*1]=0
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=4->[-1*8,5*1]=0
Evaluating equation: 7=4
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=5->[-1*8,6*1]=0
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=5->[-1*8,6*1]=0
Evaluating equation: 7=5
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=6->[-1*8,7*1]=0
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=6->[-1*8,7*1]=0
Evaluating equation: 7=6
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]
     7=7->[-1*8,8*1]=0

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: 7=7->[-1*8,8*1]=0
Evaluating equation: 7=7
Evaluates true
Evaluating equation: [-1*8,8*1]=0
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,8,r]=[7,10*1]
Tightening possibilities for: c1
Solving [c1,8,r]=[7,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [3,4,5,6,7]
Old possibilities were:         [0,1]
New possibilities are:          []
OVERCONSTRAINT: c1 has no values. Backtracking.
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6]
     s          = [9]
     r          = [2,3,4,5,6]
     o          = [0]
     n          = [8]
     m          = [1]
     e          = [7]
     d          = [2,3,4,5,6]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,7]=[y,10*c1]
     [c1,8,r]=[7,10*1]
     [9000*1,900*0,90*8,y]=[1000*9,91*7,d,10*r]

DEMONS:
     c1 :        c1=0->[d,7]<10
     c1 :        c1=1->[d,7]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,8,r]=[7,10*1]
Tightening possibilities for: c1
Solving [c1,8,r]=[7,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [3,4,5,6,7]
Old possibilities were:         [0,1]
New possibilities are:          []
OVERCONSTRAINT: c1 has no values. Backtracking.
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     1=1->[-1*n,1*1,1*e]=0
     e=2->[-1*n,3*1]=0
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [1,e,0]=[n,10*0]
     n :         [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: 1=1->[-1*n,1*1,1*e]=0
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: e
Solving [-1*n,1*1,1*e]=0 for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [2,3,4,5,6,7]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [2,3,4,5,6,7]
Tightening possibilities for: n
Solving [-1*n,1*1,1*e]=0 for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [3,4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3,4,5,6,7,8]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=2->[-1*n,3*1]=0
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [1,e,0]=[n,10*0]
     n :         [1,e,0]=[n,10*0]
```

```
Selected constraint: e=2->[-1*n,3*1]=0
Tightening possibilities for: e
Solving e=2 for e
e=[2.0*1]
Constraint gives possibilities: [2]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [2]
e is now unique. Removing its value 2 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,2,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,3*1]=0 for n
n=[3.0*1]
Constraint gives possibilities: [3]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [3]
n is now unique. Removing its value 3 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,2,0]=[3,10*0]
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,2,0]=[3,10*0]
     [1,2,0]=[3,10*0]
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]
     2=3->[-1*3,4*1]=0
     2=4->[-1*3,5*1]=0
     2=5->[-1*3,6*1]=0
     2=6->[-1*3,7*1]=0
     2=7->[-1*3,8*1]=0
```

```
DEMONS:
     c1 :         c1=0->[d,2]<10
     c1 :         c1=1->[d,2]>9
-------------------------------------------------------------
```

```
Selected constraint: [1,2,0]=[3,10*0]
Evaluating equation: [1,2,0]=[3,10*0]
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]
     2=3->[-1*3,4*1]=0
     2=4->[-1*3,5*1]=0
     2=5->[-1*3,6*1]=0
     2=6->[-1*3,7*1]=0
     2=7->[-1*3,8*1]=0

DEMONS:
     c1 :        c1=0->[d,2]<10
     c1 :        c1=1->[d,2]>9
------------------------------------------------------------
```

```
Selected constraint: 2=3->[-1*3,4*1]=0
Evaluating equation: 2=3
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]
     2=4->[-1*3,5*1]=0
     2=5->[-1*3,6*1]=0
     2=6->[-1*3,7*1]=0
     2=7->[-1*3,8*1]=0

DEMONS:
     c1 :        c1=0->[d,2]<10
     c1 :        c1=1->[d,2]>9
------------------------------------------------------------
```

```
Selected constraint: 2=4->[-1*3,5*1]=0
Evaluating equation: 2=4
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]
     2=5->[-1*3,6*1]=0
     2=6->[-1*3,7*1]=0
     2=7->[-1*3,8*1]=0

DEMONS:
     c1 :        c1=0->[d,2]<10
     c1 :        c1=1->[d,2]>9
------------------------------------------------------------
```

```
Selected constraint: 2=5->[-1*3,6*1]=0
Evaluating equation: 2=5
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]
     2=6->[-1*3,7*1]=0
     2=7->[-1*3,8*1]=0

DEMONS:
     c1 :        c1=0->[d,2]<10
     c1 :        c1=1->[d,2]>9
------------------------------------------------------------
```

```
Selected constraint: 2=6->[-1*3,7*1]=0
Evaluating equation: 2=6
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]
     2=7->[-1*3,8*1]=0

DEMONS:
     c1 :        c1=0->[d,2]<10
     c1 :        c1=1->[d,2]>9
------------------------------------------------------------
```

```
Selected constraint: 2=7->[-1*3,8*1]=0
Evaluating equation: 2=7
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [4,5,6,7,8]
     s          = [9]
     r          = [4,5,6,7,8]
     o          = [0]
     n          = [3]
     m          = [1]
     e          = [2]
     d          = [4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,2]=[y,10*c1]
     [c1,3,r]=[2,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*r]

DEMONS:
     c1 :        c1=0->[d,2]<10
     c1 :        c1=1->[d,2]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,3,r]=[2,10*1]
Tightening possibilities for: c1
Solving [c1,3,r]=[2,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [1,2,3,4,5]
Old possibilities were:         [0,1]
New possibilities are:          [1]
Values have changed. Checking demons
Moving demon to constraint list: 1=0->[d,2]<10
Moving demon to constraint list: 1=1->[d,2]>9
Tightening possibilities for: r
Solving [c1,3,r]=[2,10*1] for r
r=[9.0*1,-1.0*c1]
Constraint gives possibilities: [8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [8]
r is now unique. Removing its value 8 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [4,5,6,7]
     e          = [2]
     m          = [1]
     n          = [3]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [4,5,6,7]

CONSTRAINTS:
     1=1->[d,2]>9
     1=0->[d,2]<10
     [0,d,2]=[y,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=1->[d,2]>9
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: d
Solving [d,2]>9 for d
d>[7.0*1]
Constraint gives possibilities: [7]
Old possibilities were:         [4,5,6,7]
New possibilities are:          []
OVERCONSTRAINT: d has no values. Backtracking.
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [4,5,6,7]
     e          = [2]
     m          = [1]
     n          = [3]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [4,5,6,7]

CONSTRAINTS:
     1=0->[d,2]<10
     [0,d,2]=[y,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=0->[d,2]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [4,5,6,7]
     e          = [2]
     m          = [1]
     n          = [3]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [4,5,6,7]

CONSTRAINTS:
     [0,d,2]=[y,10*1]
     [9000*1,900*0,90*3,y]=[1000*9,91*2,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: [0,d,2]=[y,10*1]
Tightening possibilities for: d
Solving [0,d,2]=[y,10*1] for d
d=[8.0*1,1.0*y]
Constraint gives possibilities: [12,13,14,15]
Old possibilities were:         [4,5,6,7]
New possibilities are:          []
OVERCONSTRAINT: d has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==2
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [2,3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==2
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [1,e,0]=[n,10*0]
     n :         [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e\==2
Tightening possibilities for: e
Solving e\==2 for e
e\==[2.0*1]
Constraint gives possibilities: [2]
Old possibilities were:         [2,3,4,5,6,7]
New possibilities are:          [3,4,5,6,7]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [3,4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     n :         [1,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [2,3,4,5,6,7]
Old possibilities were:         [3,4,5,6,7]
New possibilities are:          [3,4,5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [4,5,6,7,8]
Old possibilities were:         [3,4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [3,4,5,6,7]
Old possibilities were:         [3,4,5,6,7]
New possibilities are:          [3,4,5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [4,5,6,7,8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [4,5,6,7,8]
Constraint: [1,e,0]=[n,10*0] caused no change. Making conditionals
Solving [1,3,0]=[n,10*0] for 0
Made new conditional constraint: e=3->[-1*n,4*1]=0
Solving [1,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,5*1]=0
Solving [1,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,6*1]=0
Solving [1,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,7*1]=0
Solving [1,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,8*1]=0
Made new demons: [[e,[1,e,0]=[n,10*0]],[n,[1,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=3->[-1*n,4*1]=0
     e=4->[-1*n,5*1]=0
```

```
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [1,e,0]=[n,10*0]
     n :          [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e=3->[-1*n,4*1]=0
Tightening possibilities for: e
Solving e=3 for e
e=[3.0*1]
Constraint gives possibilities: [3]
Old possibilities were:         [3,4,5,6,7]
New possibilities are:          [3]
e is now unique. Removing its value 3 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,3,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,4*1]=0 for n
n=[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [4]
n is now unique. Removing its value 4 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,3,0]=[4,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,5,6,7,8]
     s          = [9]
     r          = [2,5,6,7,8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [2,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,3,0]=[4,10*0]
     [1,3,0]=[4,10*0]
     [0,d,3]=[y,10*c1]
     [c1,4,r]=[3,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*r]
     3=4->[-1*4,5*1]=0
     3=5->[-1*4,6*1]=0
     3=6->[-1*4,7*1]=0
     3=7->[-1*4,8*1]=0

DEMONS:
```

```
     c1 :         c1=0->[d,3]<10
     c1 :         c1=1->[d,3]>9
-------------------------------------------------------------
```

```
Selected constraint: [1,3,0]=[4,10*0]
Evaluating equation: [1,3,0]=[4,10*0]
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,5,6,7,8]
     s          = [9]
     r          = [2,5,6,7,8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [2,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,3]=[y,10*c1]
     [c1,4,r]=[3,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*r]
     3=4->[-1*4,5*1]=0
     3=5->[-1*4,6*1]=0
     3=6->[-1*4,7*1]=0
     3=7->[-1*4,8*1]=0

DEMONS:
     c1 :        c1=0->[d,3]<10
     c1 :        c1=1->[d,3]>9
------------------------------------------------------------
```

```
Selected constraint: 3=4->[-1*4,5*1]=0
Evaluating equation: 3=4
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,5,6,7,8]
     s          = [9]
     r          = [2,5,6,7,8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [2,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,3]=[y,10*c1]
     [c1,4,r]=[3,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*r]
     3=5->[-1*4,6*1]=0
     3=6->[-1*4,7*1]=0
     3=7->[-1*4,8*1]=0

DEMONS:
     c1 :        c1=0->[d,3]<10
     c1 :        c1=1->[d,3]>9
------------------------------------------------------------
```

```
Selected constraint: 3=5->[-1*4,6*1]=0
Evaluating equation: 3=5
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,5,6,7,8]
     s          = [9]
     r          = [2,5,6,7,8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [2,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,3]=[y,10*c1]
     [c1,4,r]=[3,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*r]
     3=6->[-1*4,7*1]=0
     3=7->[-1*4,8*1]=0

DEMONS:
     c1 :        c1=0->[d,3]<10
     c1 :        c1=1->[d,3]>9
------------------------------------------------------------
```

```
Selected constraint: 3=6->[-1*4,7*1]=0
Evaluating equation: 3=6
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,5,6,7,8]
     s          = [9]
     r          = [2,5,6,7,8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [2,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,3]=[y,10*c1]
     [c1,4,r]=[3,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*r]
     3=7->[-1*4,8*1]=0

DEMONS:
     c1 :        c1=0->[d,3]<10
     c1 :        c1=1->[d,3]>9
------------------------------------------------------------
```

```
Selected constraint: 3=7->[-1*4,8*1]=0
Evaluating equation: 3=7
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,5,6,7,8]
     s          = [9]
     r          = [2,5,6,7,8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [2,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,3]=[y,10*c1]
     [c1,4,r]=[3,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*r]

DEMONS:
     c1 :        c1=0->[d,3]<10
     c1 :        c1=1->[d,3]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,4,r]=[3,10*1]
Tightening possibilities for: c1
Solving [c1,4,r]=[3,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [1,2,3,4,7]
Old possibilities were:         [0,1]
New possibilities are:          [1]
Values have changed. Checking demons
Moving demon to constraint list: 1=0->[d,3]<10
Moving demon to constraint list: 1=1->[d,3]>9
Tightening possibilities for: r
Solving [c1,4,r]=[3,10*1] for r
r=[9.0*1,-1.0*c1]
Constraint gives possibilities: [8]
Old possibilities were:         [2,5,6,7,8]
New possibilities are:          [8]
r is now unique. Removing its value 8 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,5,6,7]
     e          = [3]
     m          = [1]
     n          = [4]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,5,6,7]

CONSTRAINTS:
     1=1->[d,3]>9
     1=0->[d,3]<10
     [0,d,3]=[y,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=1->[d,3]>9
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: d
Solving [d,3]>9 for d
d>[6.0*1]
Constraint gives possibilities: [6]
Old possibilities were:         [2,5,6,7]
New possibilities are:          [7]
d is now unique. Removing its value 7 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     y          = [2,5,6]
     s          = [9]
     r          = [8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [7]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [1]
     c0         = [0]

CONSTRAINTS:
     1=0->[7,3]<10
     [0,7,3]=[y,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,7,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=0->[7,3]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,5,6]
     s          = [9]
     r          = [8]
     o          = [0]
     n          = [4]
     m          = [1]
     e          = [3]
     d          = [7]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [1]
     c0         = [0]

CONSTRAINTS:
     [0,7,3]=[y,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,7,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: [0,7,3]=[y,10*1]
Tightening possibilities for: y
Solving [0,7,3]=[y,10*1] for y
y=[0.0*1]
Constraint gives possibilities: []
Old possibilities were:         [2,5,6]
New possibilities are:          []
OVERCONSTRAINT: y has no values. Backtracking.
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,5,6,7]
     e          = [3]
     m          = [1]
     n          = [4]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,5,6,7]

CONSTRAINTS:
     1=0->[d,3]<10
     [0,d,3]=[y,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=0->[d,3]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,5,6,7]
     e          = [3]
     m          = [1]
     n          = [4]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,5,6,7]

CONSTRAINTS:
     [0,d,3]=[y,10*1]
     [9000*1,900*0,90*4,y]=[1000*9,91*3,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: [0,d,3]=[y,10*1]
Tightening possibilities for: d
Solving [0,d,3]=[y,10*1] for d
d=[7.0*1,1.0*y]
Constraint gives possibilities: [9,12,13,14]
Old possibilities were:         [2,5,6,7]
New possibilities are:          []
OVERCONSTRAINT: d has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==3
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [3,4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==3
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [1,e,0]=[n,10*0]
     n :         [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e\==3
Tightening possibilities for: e
Solving e\==3 for e
e\==[3.0*1]
Constraint gives possibilities: [3]
Old possibilities were:         [3,4,5,6,7]
New possibilities are:          [4,5,6,7]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [4,5,6,7,8]
     m          = [1]
     e          = [4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     n :         [1,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [3,4,5,6,7]
Old possibilities were:         [4,5,6,7]
New possibilities are:          [4,5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [5,6,7,8]
Old possibilities were:         [4,5,6,7,8]
New possibilities are:          [5,6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [4,5,6,7]
Old possibilities were:         [4,5,6,7]
New possibilities are:          [4,5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [5,6,7,8]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [5,6,7,8]
Constraint: [1,e,0]=[n,10*0] caused no change. Making conditionals
Solving [1,4,0]=[n,10*0] for 0
Made new conditional constraint: e=4->[-1*n,5*1]=0
Solving [1,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,6*1]=0
Solving [1,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,7*1]=0
Solving [1,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,8*1]=0
Made new demons: [[e,[1,e,0]=[n,10*0]],[n,[1,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=4->[-1*n,5*1]=0
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0
```

```
DEMONS:
     c1 :         c1=0->[d,e]<10
     c1 :         c1=1->[d,e]>9
     e :          [1,e,0]=[n,10*0]
     n :          [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e=4->[-1*n,5*1]=0
Tightening possibilities for: e
Solving e=4 for e
e=[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [4,5,6,7]
New possibilities are:          [4]
e is now unique. Removing its value 4 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,4,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,5*1]=0 for n
n=[5.0*1]
Constraint gives possibilities: [5]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [5]
n is now unique. Removing its value 5 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,4,0]=[5,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,6,7,8]
     s          = [9]
     r          = [2,3,6,7,8]
     o          = [0]
     n          = [5]
     m          = [1]
     e          = [4]
     d          = [2,3,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,4,0]=[5,10*0]
     [1,4,0]=[5,10*0]
     [0,d,4]=[y,10*c1]
     [c1,5,r]=[4,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*r]
     4=5->[-1*5,6*1]=0
     4=6->[-1*5,7*1]=0
     4=7->[-1*5,8*1]=0

DEMONS:
     c1 :        c1=0->[d,4]<10
```

```
     c1 :         c1=1->[d,4]>9
-------------------------------------------------------------
```

```
Selected constraint: [1,4,0]=[5,10*0]
Evaluating equation: [1,4,0]=[5,10*0]
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,3,6,7,8]
     s          = [9]
     r          = [2,3,6,7,8]
     o          = [0]
     n          = [5]
     m          = [1]
     e          = [4]
     d          = [2,3,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,4]=[y,10*c1]
     [c1,5,r]=[4,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*r]
     4=5->[-1*5,6*1]=0
     4=6->[-1*5,7*1]=0
     4=7->[-1*5,8*1]=0

DEMONS:
     c1 :        c1=0->[d,4]<10
     c1 :        c1=1->[d,4]>9
------------------------------------------------------------
```

```
Selected constraint: 4=5->[-1*5,6*1]=0
Evaluating equation: 4=5
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,6,7,8]
     s          = [9]
     r          = [2,3,6,7,8]
     o          = [0]
     n          = [5]
     m          = [1]
     e          = [4]
     d          = [2,3,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,4]=[y,10*c1]
     [c1,5,r]=[4,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*r]
     4=6->[-1*5,7*1]=0
     4=7->[-1*5,8*1]=0

DEMONS:
     c1 :        c1=0->[d,4]<10
     c1 :        c1=1->[d,4]>9
------------------------------------------------------------
```

```
Selected constraint: 4=6->[-1*5,7*1]=0
Evaluating equation: 4=6
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,6,7,8]
     s          = [9]
     r          = [2,3,6,7,8]
     o          = [0]
     n          = [5]
     m          = [1]
     e          = [4]
     d          = [2,3,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,4]=[y,10*c1]
     [c1,5,r]=[4,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*r]
     4=7->[-1*5,8*1]=0

DEMONS:
     c1 :        c1=0->[d,4]<10
     c1 :        c1=1->[d,4]>9
------------------------------------------------------------
```

```
Selected constraint: 4=7->[-1*5,8*1]=0
Evaluating equation: 4=7
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,6,7,8]
     s          = [9]
     r          = [2,3,6,7,8]
     o          = [0]
     n          = [5]
     m          = [1]
     e          = [4]
     d          = [2,3,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,4]=[y,10*c1]
     [c1,5,r]=[4,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*r]

DEMONS:
     c1 :        c1=0->[d,4]<10
     c1 :        c1=1->[d,4]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,5,r]=[4,10*1]
Tightening possibilities for: c1
Solving [c1,5,r]=[4,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [1,2,3,6,7]
Old possibilities were:         [0,1]
New possibilities are:          [1]
Values have changed. Checking demons
Moving demon to constraint list: 1=0->[d,4]<10
Moving demon to constraint list: 1=1->[d,4]>9
Tightening possibilities for: r
Solving [c1,5,r]=[4,10*1] for r
r=[9.0*1,-1.0*c1]
Constraint gives possibilities: [8]
Old possibilities were:         [2,3,6,7,8]
New possibilities are:          [8]
r is now unique. Removing its value 8 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,3,6,7]
     e          = [4]
     m          = [1]
     n          = [5]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,3,6,7]

CONSTRAINTS:
     1=1->[d,4]>9
     1=0->[d,4]<10
     [0,d,4]=[y,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=1->[d,4]>9
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: d
Solving [d,4]>9 for d
d>[5.0*1]
Constraint gives possibilities: [5]
Old possibilities were:         [2,3,6,7]
New possibilities are:          [6,7]
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [6,7]
     e          = [4]
     m          = [1]
     n          = [5]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,3,6,7]

CONSTRAINTS:
     1=0->[d,4]<10
     [0,d,4]=[y,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=0->[d,4]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [6,7]
     e          = [4]
     m          = [1]
     n          = [5]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,3,6,7]

CONSTRAINTS:
     [0,d,4]=[y,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: [0,d,4]=[y,10*1]
Tightening possibilities for: d
Solving [0,d,4]=[y,10*1] for d
d=[6.0*1,1.0*y]
Constraint gives possibilities: [8,9,12,13]
Old possibilities were:         [6,7]
New possibilities are:          []
OVERCONSTRAINT: d has no values. Backtracking.
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,3,6,7]
     e          = [4]
     m          = [1]
     n          = [5]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,3,6,7]

CONSTRAINTS:
     1=0->[d,4]<10
     [0,d,4]=[y,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=0->[d,4]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,3,6,7]
     e          = [4]
     m          = [1]
     n          = [5]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,3,6,7]

CONSTRAINTS:
     [0,d,4]=[y,10*1]
     [9000*1,900*0,90*5,y]=[1000*9,91*4,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: [0,d,4]=[y,10*1]
Tightening possibilities for: d
Solving [0,d,4]=[y,10*1] for d
d=[6.0*1,1.0*y]
Constraint gives possibilities: [8,9,12,13]
Old possibilities were:         [2,3,6,7]
New possibilities are:          []
OVERCONSTRAINT: d has no values. Backtracking.
Conditional constraint failed, asserting negation: e\==4
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [4,5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     e\==4
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
     e :         [1,e,0]=[n,10*0]
     n :         [1,e,0]=[n,10*0]
------------------------------------------------------------
```

```
Selected constraint: e\==4
Tightening possibilities for: e
Solving e\==4 for e
e\==[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [4,5,6,7]
New possibilities are:          [5,6,7]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [5,6,7,8]
     m          = [1]
     e          = [5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     n :         [1,e,0]=[n,10*0]
     c1 :        c1=1->[d,e]>9
     c1 :        c1=0->[d,e]<10
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [4,5,6,7]
Old possibilities were:         [5,6,7]
New possibilities are:          [5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [6,7,8]
Old possibilities were:         [5,6,7,8]
New possibilities are:          [6,7,8]
Values have changed. Checking demons
Moving demon to constraint list: [1,e,0]=[n,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [6,7,8]
     m          = [1]
     e          = [5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,e,0]=[n,10*0]
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
     c1 :        c1=1->[d,e]>9
------------------------------------------------------------
```

```
Selected constraint: [1,e,0]=[n,10*0]
Tightening possibilities for: e
Solving [1,e,0]=[n,10*0] for e
e=[1.0*n,-1.0*1]
Constraint gives possibilities: [5,6,7]
Old possibilities were:         [5,6,7]
New possibilities are:          [5,6,7]
Tightening possibilities for: n
Solving [1,e,0]=[n,10*0] for n
n=[1.0*1,1.0*e]
Constraint gives possibilities: [6,7,8]
Old possibilities were:         [6,7,8]
New possibilities are:          [6,7,8]
Constraint: [1,e,0]=[n,10*0] caused no change. Making conditionals
Solving [1,5,0]=[n,10*0] for 0
Made new conditional constraint: e=5->[-1*n,6*1]=0
Solving [1,6,0]=[n,10*0] for 0
Made new conditional constraint: e=6->[-1*n,7*1]=0
Solving [1,7,0]=[n,10*0] for 0
Made new conditional constraint: e=7->[-1*n,8*1]=0
Made new demons: [[e,[1,e,0]=[n,10*0]],[n,[1,e,0]=[n,10*0]]]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,5,6,7,8]
     s          = [9]
     r          = [2,3,4,5,6,7,8]
     o          = [0]
     n          = [6,7,8]
     m          = [1]
     e          = [5,6,7]
     d          = [2,3,4,5,6,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,e]=[y,10*c1]
     [c1,n,r]=[e,10*1]
     [9000*1,900*0,90*n,y]=[1000*9,91*e,d,10*r]
     e=5->[-1*n,6*1]=0
     e=6->[-1*n,7*1]=0
     e=7->[-1*n,8*1]=0

DEMONS:
     c1 :        c1=0->[d,e]<10
```

```
     c1 :         c1=1->[d,e]>9
     e :          [1,e,0]=[n,10*0]
     n :          [1,e,0]=[n,10*0]
-------------------------------------------------------------
```

```
Selected constraint: e=5->[-1*n,6*1]=0
Tightening possibilities for: e
Solving e=5 for e
e=[5.0*1]
Constraint gives possibilities: [5]
Old possibilities were:         [5,6,7]
New possibilities are:          [5]
e is now unique. Removing its value 5 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,5,0]=[n,10*0]
Tightening possibilities for: n
Solving [-1*n,6*1]=0 for n
n=[6.0*1]
Constraint gives possibilities: [6]
Old possibilities were:         [6,7,8]
New possibilities are:          [6]
n is now unique. Removing its value 6 from others
Values have changed. Checking demons
Moving demon to constraint list: [1,5,0]=[6,10*0]
------------------------------------------------------------
VALUES:
     y          = [2,3,4,7,8]
     s          = [9]
     r          = [2,3,4,7,8]
     o          = [0]
     n          = [6]
     m          = [1]
     e          = [5]
     d          = [2,3,4,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [1,5,0]=[6,10*0]
     [1,5,0]=[6,10*0]
     [0,d,5]=[y,10*c1]
     [c1,6,r]=[5,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,d,10*r]
     5=6->[-1*6,7*1]=0
     5=7->[-1*6,8*1]=0

DEMONS:
     c1 :        c1=0->[d,5]<10
     c1 :        c1=1->[d,5]>9
```

```
Selected constraint: [1,5,0]=[6,10*0]
Evaluating equation: [1,5,0]=[6,10*0]
Evaluates true
------------------------------------------------------------
VALUES:
     y          = [2,3,4,7,8]
     s          = [9]
     r          = [2,3,4,7,8]
     o          = [0]
     n          = [6]
     m          = [1]
     e          = [5]
     d          = [2,3,4,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,5]=[y,10*c1]
     [c1,6,r]=[5,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,d,10*r]
     5=6->[-1*6,7*1]=0
     5=7->[-1*6,8*1]=0

DEMONS:
     c1 :        c1=0->[d,5]<10
     c1 :        c1=1->[d,5]>9
------------------------------------------------------------
```

```
Selected constraint: 5=6->[-1*6,7*1]=0
Evaluating equation: 5=6
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,7,8]
     s          = [9]
     r          = [2,3,4,7,8]
     o          = [0]
     n          = [6]
     m          = [1]
     e          = [5]
     d          = [2,3,4,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,5]=[y,10*c1]
     [c1,6,r]=[5,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,d,10*r]
     5=7->[-1*6,8*1]=0

DEMONS:
     c1 :        c1=0->[d,5]<10
     c1 :        c1=1->[d,5]>9
------------------------------------------------------------
```

```
Selected constraint: 5=7->[-1*6,8*1]=0
Evaluating equation: 5=7
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4,7,8]
     s          = [9]
     r          = [2,3,4,7,8]
     o          = [0]
     n          = [6]
     m          = [1]
     e          = [5]
     d          = [2,3,4,7,8]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [0,1]
     c0         = [0]

CONSTRAINTS:
     [0,d,5]=[y,10*c1]
     [c1,6,r]=[5,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,d,10*r]

DEMONS:
     c1 :        c1=0->[d,5]<10
     c1 :        c1=1->[d,5]>9
------------------------------------------------------------
```

```
Selected constraint: [c1,6,r]=[5,10*1]
Tightening possibilities for: c1
Solving [c1,6,r]=[5,10*1] for c1
c1=[9.0*1,-1.0*r]
Constraint gives possibilities: [1,2,5,6,7]
Old possibilities were:         [0,1]
New possibilities are:          [1]
Values have changed. Checking demons
Moving demon to constraint list: 1=0->[d,5]<10
Moving demon to constraint list: 1=1->[d,5]>9
Tightening possibilities for: r
Solving [c1,6,r]=[5,10*1] for r
r=[9.0*1,-1.0*c1]
Constraint gives possibilities: [8]
Old possibilities were:         [2,3,4,7,8]
New possibilities are:          [8]
r is now unique. Removing its value 8 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [2,3,4,7]
     e          = [5]
     m          = [1]
     n          = [6]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2,3,4,7]

CONSTRAINTS:
     1=1->[d,5]>9
     1=0->[d,5]<10
     [0,d,5]=[y,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,d,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=1->[d,5]>9
Evaluating equation: 1=1
Evaluates true
Tightening possibilities for: d
Solving [d,5]>9 for d
d>[4.0*1]
Constraint gives possibilities: [4]
Old possibilities were:         [2,3,4,7]
New possibilities are:          [7]
d is now unique. Removing its value 7 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     y          = [2,3,4]
     s          = [9]
     r          = [8]
     o          = [0]
     n          = [6]
     m          = [1]
     e          = [5]
     d          = [7]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [1]
     c0         = [0]

CONSTRAINTS:
     1=0->[7,5]<10
     [0,7,5]=[y,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,7,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: 1=0->[7,5]<10
Evaluating equation: 1=0
Evaluates false
------------------------------------------------------------
VALUES:
     y          = [2,3,4]
     s          = [9]
     r          = [8]
     o          = [0]
     n          = [6]
     m          = [1]
     e          = [5]
     d          = [7]
     c5         = [0]
     c4         = [1]
     c3         = [0]
     c2         = [1]
     c1         = [1]
     c0         = [0]

CONSTRAINTS:
     [0,7,5]=[y,10*1]
     [9000*1,900*0,90*6,y]=[1000*9,91*5,7,10*8]

DEMONS:
------------------------------------------------------------
```

```
Selected constraint: [0,7,5]=[y,10*1]
Tightening possibilities for: y
Solving [0,7,5]=[y,10*1] for y
y=[2.0*1]
Constraint gives possibilities: [2]
Old possibilities were:         [2,3,4]
New possibilities are:          [2]
y is now unique. Removing its value 2 from others
Values have changed. Checking demons
------------------------------------------------------------
VALUES:
     c0         = [0]
     c1         = [1]
     c2         = [1]
     c3         = [0]
     c4         = [1]
     c5         = [0]
     d          = [7]
     e          = [5]
     m          = [1]
     n          = [6]
     o          = [0]
     r          = [8]
     s          = [9]
     y          = [2]

CONSTRAINTS:
     [9000*1,900*0,90*6,2]=[1000*9,91*5,7,10*8]

DEMONS:
------------------------------------------------------------
```

```
Evaluating equation: [9000*1,900*0,90*6,2]=[1000*9,91*5,7,10*8]
Evaluates true
Done.

yes
[trace]
| ?- ^D
[ End of Prolog execution ]
376.2u 7.5s 16:28 38% 80+2328k 13+10io 0pf+0w
moon(2)-> ^D
script done on Fri Oct 30 02:26:09 198
```