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Install z3 and imports

```
!pip install z3-solver
```

```
from z3 import *
```

Futoshiki Puzzle

Um exemplo de tabuleiro para teste, cuja solução está nos ficheiros deste notebook (futoshiki_solucao.JPG):

```
n = 4
tabuleiro =
"1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,3,0_1_>_0_2;1_0_>_1_1;1_1_>_2_1;1_2_<_2_2;3_1_>
_3_2"
```

```
# exemplo de tabuleiro para teste:
# 1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,3,0_1_>_0_2;1_0_>_1_1;1_1_>_2_1;1_2_<_2_2;3_1_>

n = int(input("Números por linha (n): "))
tabuleiro = input("Tabuleiro (exemplo para n=2: 1,0,0,0,0_0_<_0_1;0_1_>_1_1): "

s = Solver()

x = {}
for i in range (n) :
  x[i] = {}
  for j in range (n) :
    x[i][j] = Int('x'+str(i)+str(j))
    s.add(And(1 <= x[i][j], x[i][j] <= n))

# restrições de linha
for i in range (n):
  s.add(Distinct ([ x[i][j] for j in range (n) ]))
```

```
# restrições de coluna
for j in range (n):
  s.add(Distinct([ x[i][j] for i in range (n) ]))

for i in range(n):
  for j in range(n):
    if tabuleiro.split(',')[i * n + j] != '0':
      s.add(x[i][j] == int(tabuleiro.split(',')[i * n + j]))



conds = tabuleiro.split(',')[-1].split(';')
for k in range(len(conds)):
  i1 = int(tabuleiro.split(',')[-1].split(';')[k].split('_')[0])
  j1 = int(tabuleiro.split(',')[-1].split(';')[k].split('_')[1])
  i2 = int(tabuleiro.split(',')[-1].split(';')[k].split('_')[3])
  j2 = int(tabuleiro.split(',')[-1].split(';')[k].split('_')[4])
  if tabuleiro.split(',')[-1].split(';')[k].split('_')[2] == '<':
    s.add(x[i1][j1] < x[i2][j2])
  elif tabuleiro.split(',')[-1].split(';')[k].split('_')[2] == '>':
    s.add(x[i1][j1] > x[i2][j2])

#for c in s.assertions():
#  print(c)

print(s.check())

if s.check() == sat:
  m = s.model()
  for i in range(n):
    print([ m[x[i][j]].as_long() for j in range(n) ])
else:
  print("não tem solução")
```