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1  def conv(grid,r1,r2,r3,r4,c1,c2,c3,c4):
2      grid[r1][c1] = "0"
3      grid[r2][c2] = "0"
4      grid[r3][c3] = "0"
5      grid[r4][c4] = "0"
6      return grid
7  convert = {"0":"0000","1":"0001","2":"0010","3":"0011","4":"0100","5":"0101","6":"0110","7":"0111","8":"1000","9":"1001","A":"1010","B":"1011","C":
8  row = {"0":"B",1:"~B"}
9  col = {"2":"A",3:"C",4:"~C",5:"~A"}
10 topcol = {"0":"A",1:"A",2:"~A",3:"~A"}
11 botcol = {"0:"~C",1:"C",2:"C",3:"~C"}
12 f = open("3jr_testdata.txt","r")
13 for line in f.readlines():
14     userinput = line.rstrip("\n")
15     grid = [[],[]]
16     for x in range(len(userinput)):
17         for y in range(len(convert[userinput[x]])):
18             grid[x].append(convert[userinput[x]][y])
19     coordinates = []
20     for x in range(len(grid)):
21         for y in range(len(grid[x])):
22             if grid[x][y] == "1":
23                 coordinates.append(str(x)+str(y))
24     finaloutput = []
25     check = 0
26     rowcheck = []
27     while grid[0].count("1") != 0 or grid[1].count("1") != 0:
28 #Group 4
29     #2x2 X's
30     for x in range(4):
31         if grid[0][0] == '1' and grid[0][1] == '1' and grid[1][0] == '1' and grid[1][1] == '1':
32             finaloutput.append("A")
33             grid = conv(grid,0,0,1,1,0,1,0,1)
34         if grid[0][2] == '1' and grid[0][1] == '1' and grid[1][2] == '1' and grid[1][1] == '1':
35             finaloutput.append("C")
36             grid = conv(grid,0,0,1,1,2,1,2,1)
37         if grid[0][2] == '1' and grid[0][3] == '1' and grid[1][2] == '1' and grid[1][3] == '1':
38             finaloutput.append("~A")
39             grid = conv(grid,0,0,1,1,2,3,2,3)
40         if grid[0][3] == "1" and grid[1][3] == "1" and grid[1][0] == '1' and grid[0][0] == '1':
41             finaloutput.append("~C")
42             grid = conv(grid,0,0,1,1,0,3,0,3)
43     for x in range(2):
44         actualcheck = []
45         rowcheck = []
46         for i in range(len(coordinates)):
47             if coordinates[i][0] == str(x):
48                 rowcheck.append(coordinates[i])
49         for y in range(len(sorted(rowcheck))):
50             actualcheck.append(rowcheck[y][1])
51         if actualcheck == ["0","1","2","3"]:
52             grid = conv(grid,x,x,x,x,0,1,2,3)
53             finaloutput.append(row[x])
54 #Group 2
55     for x in range(2):
56         for y in range(len(grid[x])):
57             if y != 3:
58                 if grid[x][y] == "1" and grid[x][y+1] == "1":
59                     if topcol[y] == topcol[y+1]:
60                         finaloutput.append(topcol[y]+row[x])
61                     else:
62                         finaloutput.append(row[x]+botcol[y])
63                         grid[x][y],grid[x][y+1] = "0","0"
64     for x in range(2):
65         for y in range(len(grid[x])):
66             if x == 0:
67                 if grid[x][y] == "1" and grid[x+1][y] == "1":
68                     finaloutput.append(topcol[y]+botcol[y])
69                     grid[x][y],grid[x+1][y] = "0","0"
70     for x in range(2):
71         if grid[x][3] == "1" and grid[x][0] == "1":
72             grid[x][3],grid[x][0] = "0","0"
73             finaloutput.append(row[x]+"~C")
74 #Group 1
75     for x in range(2):
76         for y in range(len(grid[x])):
77             if grid[x][y] == "1":
78                 finaloutput.append(topcol[y]+row[x]+botcol[y])
79                 grid[x][y] = "0"
80     print(" + ".join(finaloutput))
81

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