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LAB 4

GOAL BASED AGENT

```
import random as r
```

```
class environment:
    def __init__(self, size):
        self.size = size
        self.field = [['#']*(size+2)] + [['#']+[' ']*size+['#']]*size +[['#']*(size+2)]
        l = ['#', 'o', ' ']
        for i in range(1,51):
            self.field[i] = ['#'] +  r.choices(l, weights=[1,1,10], k = self.size) + ['#']


    def display(self):
        for i in range(self.size+2):
            for j in range(self.size+2):
                print(self.field[i][j], end='')
            print()
```

```
env = environment(50)
```

```
env.display()
```

```
##################################################
#       #      o#o         o   #   #  #  o     o   #
# #         #oo o    ##          o           o#    ##
#o    # o##                        #o         #  oo #
#         #           #         oo#       o  o       #
#    o#   o   o# o    o   o          o o o# o        #
#   #   #   #         o         o    o    o # #      #
#    #     o    o  o    #       o    o         #     #
#      #    o#      #       ##  o        #   #   o  ##
# #     o #   # o#     o  o       oo              o  #
# #          #       #         #     oo    o  o # #
#o#             #  o          #oo  o     o o        #
#          o    o o          o              o #     ##
#        o# #  #             oo       # #   o  o    #
# o      o               #               o  #       ##
#  #         o         ##          #     #          #
#                   o  # #    o       o      #      #
##           o           oo      #            o o   #
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#  #  o#                                o      #   #
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#   o          o              o     #   # o       o  ##
# o    o   ##    o   # o         #       o      #   #
#        #   ##o              o   #    #   #    o  #
#  #       oo#                  oo # o            #
#                o    o                          # #
#o     #      #o     o         o      o   #  #    ###
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#  o             o      o      oo #      #        ##
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#   # # o  o#o  #   oo o  o                #        #
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#        o  o #       o  #       o     #      #    #
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#o  #           ##    #     o   o     #           #
#                        #                 #  o  #
#                    #o                    o   #  #
#  o      #  o      # # o  # # #  o         #  #   #
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#o  o      o o              #o #  o         #     #
#  o     o           o  # oo       #   #    o     #
##################################################
```
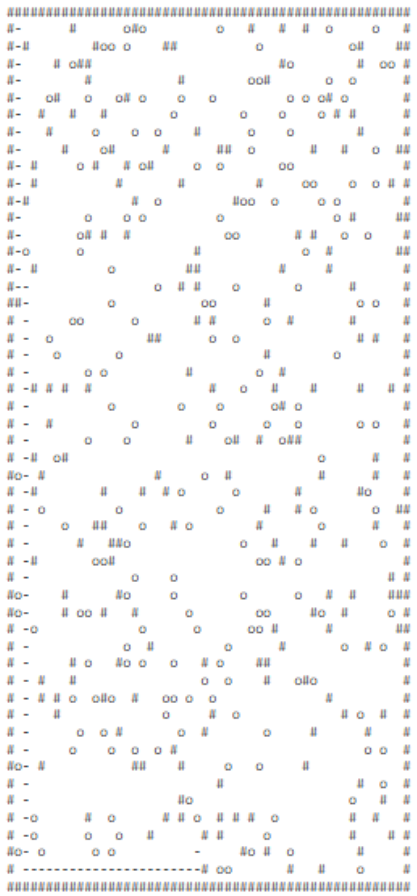

```python
class agent:
    def __init__(self,env):
        self.env = env
        self.coins = 0
        self.distance = 0
        self.steps = 0
        self.x = 1
        self.y = 1
        self.history = [(-1,-1)]

    def decide(self, x,y):
        if self.env.field[x+1][y] != '#':
            x = x+1
            if self.env.field[x+1][y] == 'o':
                self.coins += 1
                self.env.field[x+1][y] = ' '
        elif self.env.field[x][y+1] != '#':
            y = y+1
            if self.env.field[x][y+1] == 'o':
                self.coins += 1
                self.env.field[x][y+1] = ' '
        elif self.env.field[x-1][y] != '#':
            x = x-1
            if self.env.field[x-1][y] == 'o':
                self.coins += 1
                self.env.field[x-1][y] = ' '
        elif self.env.field[x][y-1] == ' ' or self.env.field[x][y-1] == 'o':
            y = y-1
            if self.env.field[x][y-1] == 'o':
                self.coins += 1
                self.env.field[x][y-1] = ' '
        else:
            return -1,-1
        return x,y

    def move(self, x,y):
        self.x = x
        self.y = y
        while(True):
            [a,b] = self.decide(self.x,self.y)
            if [a,b] == [-1,-1]:
                print("Collision")
                break
            self.env.field[self.x][self.y] = '-'
            self.x,self.y = a,b
            print(a,b)
            if((a,b) in self.history):
                break
            self.history.insert(0,(a,b))
```

```python
a = agent(env)
```

```python
a.move(1,1)
```

```
2 1
3 1
4 1
5 1
6 1
7 1
8 1
9 1
10 1
11 1
12 1
13 1
14 1
15 1
16 1
16 2
17 2
18 2
19 2
20 2
21 2
22 2
23 2
24 2
25 2
26 2
27 2
28 2
29 2
30 2
31 2
32 2
33 2
34 2
35 2
36 2
37 2
38 2
39 2
40 2
41 2
42 2
43 2
44 2
45 2
46 2
47 2
48 2
49 2
50 2
50 3
50 4
50 5
50 6
50 7
50 8
50 9
50 10
50 11
50 12
50 13
50 14
50 15
50 16
50 17
50 18
50 19
50 20
50 21
50 22
50 23
50 24
49 24
50 24
```

```
env.display()
```



```
a.coins
```

```
0
```

```
a.history
```

```
[(2, 1), (-1, -1)]
```

```
(38,7) in a.history
```

```
False
```