6/11/10

Vacuum Cleaner Problem

Algorithm:

Step 1: Take the two rooms as an array of numbers where 0 represents that the room is clean and 1 represents that the room is dirty.

Step 2: Start from the first room. Check if it is dirty. If it is dirty, clean the room and move to its neighbour.

Step 3: Check if the room is dirty. If the room is dirty, clean the room. Check if all the rooms are clean. If all rooms are clean, ~~move~~ go to step 4 otherwise move to its neighbour and repeat step 3.

Step 4: Go back to start.

Percept Sequence

Location	Status	Action
Room 1	0	Move right
Room 1	1	Clean room
Room 2	0	Move left
Room 2	1	Clean room

Pseudocode:

```
rooms ← [1, 1]
curr ← 0
while true, do
    if rooms[curr] == 1, then
        rooms[curr] ← 0
        curr ← (curr + 1) % 2
    rooms[curr]
        rooms[curr] ← random (0, 1)
        if rooms[curr] == 0, then
            break
    else
        curr ← (curr + 1) % 2
        if rooms[curr] == 0:
            break
```

Code:

```
import random
rooms = [random.choice([0, 1]), random.choice([0,1])]
curr = 0

def check(x):
    if x:
        return "Clean"
    return "Dirty"

while(1):
    print(rooms)
    print(f"Location: Room {curr + 1}, Status: {check(rooms[curr])}")
```

```
if rooms[curr] == 1:
    rooms[curr] = 0
    print(f"Room {curr+1} cleaned")
    curr = (curr + 1) % 2
    if rooms[curr] == 0:
        rooms[curr] = random.choice([0,1])
        if rooms[curr]:
            print(f"Room{curr+1} got dirty!")
        if rooms[curr] == 0:
            break
else:
    curr = (curr + 1) % 2
    if rooms[curr] == 0:
        break
print(rooms)
print("All rooms are clean!")
```

Output:

```
[0, 1]
Location: Room1, Status: Clean
[0, 1]
Location: Room2, Status: Dirty
Room2 cleaned
Room1 got dirty!
[1, 0]
Location: Room 1, Status: Dirty
Room1 cleaned
[0, 0]
All rooms are clean!
```

1/10/24