LAB - 2

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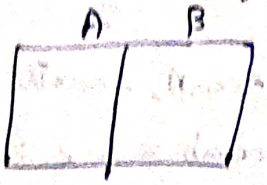
Write an algorithm and a program for a AI controlled vacuum cleaner

Step 1: Create two rooms using ~~2 variables~~ A, B, as an array or list

The room A is on the left. The room 'B' will be rightside of 'A':



arr[2]
arr[0] = A
arr[1] = B

→ Get the user input as '0' or '1'. '0' indicates that the room is dirty. '1' indicates, room is clean.

→ The agent is in room 'A', now we should a define a function to check if the room is clean or dirty.

⇒ User input ⇒ roomA, roomB → variables ⇒ 0 or 1

(i) def check_clean(var1, var2)

~~while (var==True):~~

~~if clean~~

if var1 == 0:
    #clean
    var = 1
else: move_room(var1, var2)
    break

if var2 == 0:
    #clean
    var = 1

(ii) This function is used to move from one room to another taking the input as the consideration. The agent should move if and only if the current room is already clean.

def move_room ~~(var)~~ (roomA, roomB):
    while (True):
        if roomA == 1:
            check_clean(roomA, roomB)
        elif roomB == 1:
            check_clean(roomA, roomB)

if (roomA == 1 and roomB == 1):
    break

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(iii) This function is used to stop the agent after both rooms are clean

def check_comp (roomA, roomB):
    if roomA + roomB == 2:
        # stop
        break

Program :-

print ("Enter 0 if dirty, 1 if clean)
roomA = int(input("Enter status for room A: "))
roomB = int(input("Enter status for room B: "))

def check_clean (room):
    if room == 0:
        room = 1
    return room

def print_status (roomA, roomB, current_room):
    print (f"Current status: Room A: {'Clean' if roomA == 1 else 'Dirty'}, Room B: {'Clean' if roomB == 1 else 'Dirty'}")
    print (f"Agent is currently in room {current_room}")

def move_rooms (roomA, roomB):
    current_room = 'A' if roomA == 0 else 'B' if roomB == 0 else
    while roomA == 0 or roomB == 0:
        if roomA == 0:
            print_status (roomA, roomB, 'A')
            roomA = check_clean (roomA)
            print ("Room A cleared")

```
if roomB == 0:
    print_status(roomA, roomB, 'B')
    roomB = check_clean(roomB)
    print("Room B cleaned")

if RoomA == 1 and roomB == 0:
    current_room = 'B'
    print("Agent moves to room B.")
elif RoomB == 1 and roomA == 0:
    current_room = 'A'
    print("Agent moves to room A.")

print_status(roomA, roomB, current_room)
print("Both rooms done cleaning")

move_rooms(roomA, roomB)
```

Output:

```
Enter 0 if dirty, 1 if clean
Enter status for room A: 0
Enter status for room B: 0
Current status: Room A: Dirty, Room B: Dirty
Agent is currently in Room A
Room A cleaned
Current status: Room A: Clean, Room B: Dirty
Agent is currently in Room B
Room B Cleaned
Current status: RoomA: clean, Room B: Clean
Agent is currently in Room A
Both rooms done cleaning
```

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Code for a generalised no of rooms

→ rooms = [ ]

```
def move_agent(rooms):
    for i in range(len(rooms)):
        print(f"\nAgent is in room {i+1}")
        if rooms[i] == 0:
            rooms = clean(rooms, i, f"Room {i+1}")
        else:
            print(f"Room {i+1} already cleared")
    if all(room == 1 for room in rooms):
        print("\nAll rooms cleared")
    else:
        print("\nAgent is moving back to check rooms again")
        move_agent(rooms)
```

Output:

```
0 - dirty and 1 - clean
Enter the no of rooms: 4
Enter status for room 1: 1
                room 2: 1
                room 3: 1
                room 4: 0

Agent is in room 1
Room 1 already cleared
Agent is in room 2
Room 2 already cleared
Agent is in room 3
Room 3 already cleared
Agent is in room 4
Room 4 cleared
All rooms are cleared
```

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