

Experiment No. 1

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Class : TE COMPS Batch C

Subject : AIML

Aim : To create an Intelligent Agent using AI.

Theory :

An intelligent agent is a program that can make decisions or perform a service based on its environment, user input and experiences. These programs can be used to autonomously gather information on a regular, programmed schedule or when prompted by the user in real time.

The PEAS system delivers the performance measure with respect to the environment, actuators and sensors of the respective agent. Most of the highest performing agents are Rational Agents.

Rational Agent: The rational agent considers all possibilities and chooses to perform the highly efficient action. For example it chooses the shortest path with low cost for high efficiency.

PEAS stands for *Performance measure, Environment, Actuator, Sensor*.

1. **Performance Measure:** Performance measure is the unit to define the success of an agent. Performance varies with agents based on their different precept.
2. **Environment:** Environment is the surrounding of an agent at every instant. It keeps changing with time if the agent is set in motion. There are 5 major types of environments:
 - Fully Observable & Partially Observable
 - Episodic & Sequential
 - Static & Dynamic
 - Discrete & Continuous
 - Deterministic & Stochastic
3. **Actuator:** Actuator is a part of the agent that delivers the output of an action to the environment.
4. **Sensor:** Sensors are the receptive parts of an agent which takes in the input for the agent.

Program :

```
from tkinter import *
from time import *
import random

# '0' means clean & '1' means dirty
def initmap(row,col):
    global dirty_pieces
```

```

global maps
global visited
for j in range(row):
    tmp = []
    tmpv = []
    for i in range(col):
        rand = random.randint(0,1)
        if rand == 1 :
            dirty_pieces = dirty_pieces + 1
            tmp.append(rand)                #initializing pieces with random
cleanliness
            tmpv.append(0)
        visited.append(tmpv)
    maps.append(tmp)

for i in range(row):
    tmp = []
    for j in range(col):
        if maps[i][j] == 0 :
            tmp.append(Label(image = tile_clean ))
        else:
            tmp.append(Label(image = tile_dirty ))
    lab1.append(tmp)

for i in range(row):
    for j in range(col):
        lab1[i][j].grid(row=i,column=j)

def cleanmaster(row,col,vacpos):
    cleaned_pieces=0
    for i in range(row):
        for j in range(col):
            vacpos[0]=i
            vacpos[1]=j
            lab1[vacpos[0]][vacpos[1]].config(image = Vacuum)
            mygui.update()
            sleep(1)
            lab1[vacpos[0]][vacpos[1]].config(image = tile_clean)
            mygui.update()
            sleep(0)
            if maps[vacpos[0]][vacpos[1]]==1:
                maps[vacpos[0]][vacpos[1]] = 0
                lab1[vacpos[0]][vacpos[1]].config(image = done_icon)
                mygui.update()
                sleep(1)
                cleaned_pieces = cleaned_pieces + 1
    print('-----')
    print('Environment Total Pieces :' , rows*cols)

```

```

print('dirty_pieces : ', dirty_pieces)
print('cleaned_pieces : ', cleaned_pieces)

print("Current location of vacuum cleaner: ",vacpos)
print('-----')
print('env. after cleaning:')
for i in range (rows):
    print (maps[i])

#main

#initializing

maps = []
tmp_maps = []
visited = []
visited_pieces = 0
dirty_pieces = 0
cleaned_pieces = 0

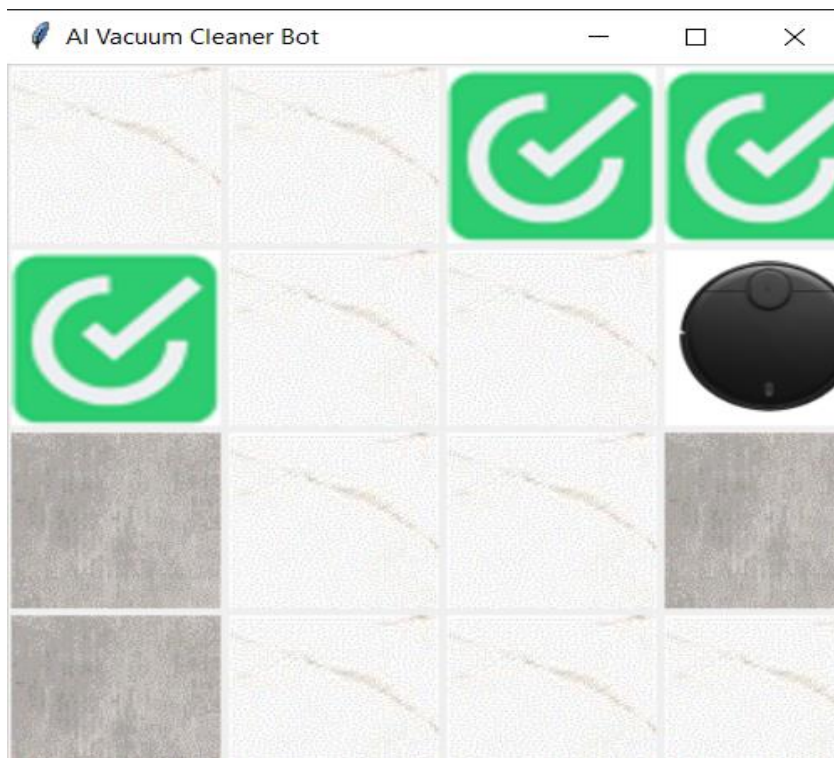
rows = 4          #Row number
cols = 4          #Column number
vac_pos = [0,0]   #Current Cursor
vac_str = str(vac_pos[0]) + str(vac_pos[1])
mygui = Tk()
mygui.title("AI Vacuum Cleaner Bot")
mygui.geometry("400x400")
lab1 = []
tile_clean = PhotoImage(file="Src\\tile2.gif")
tile_dirty = PhotoImage(file="Src\\tile1.gif")
done_icon = PhotoImage(file="Src\\done_icon.png")
Vacuum = PhotoImage(file="Src\\Vacuum.gif")
initmap(rows,cols)
mygui.update()
tmp_maps = maps[:]

print('-----')
print('Current Cursor Location :' , vac_pos)
print('-----')
print('env. before cleaning:')
#showing the whole env.
for i in range (rows):
    print (maps[i])
cleanmaster(rows,cols,vac_pos)
print("Done Cleaning!!")
mygui.mainloop()

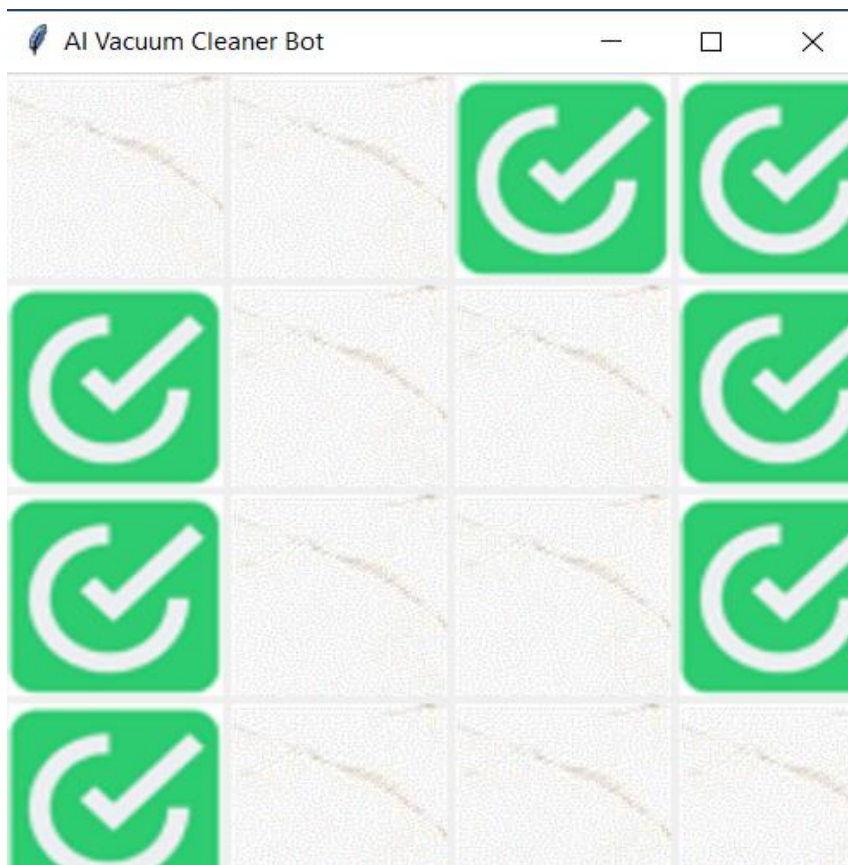
```

Output:

Generates random dirt on the map and vacuum cleaner go through each tile cleaning the dirt marking it as done_cleaning .



After Cleaning:



Conclusion : I learned about what Intelligent agents are . I was able to create AI – Vacuum Cleaner Bot as an Intelligent Agent. PEAS of AI – Vacuum Cleaner performs cleanness and travels distance to clean while my environment can be room, table ,etc . Actuators are the Wheels to move around and in Sensors it detects the dirt and suck it .