EXPERIMENT:6

Vacuum Cleaner problem

AIM: To write the python program for Vacuum Cleaner problem

**Algorithm:**

1. Define a function **display** to print the state of the room.
2. Initialize the **room** as a 4x4 grid with all elements set to 1, indicating that all parts of the room are dirty.
3. Print the initial state of the room indicating that all parts of the room are dirty.
4. Iterate over each cell in the room using nested loops:
   * Randomly set each cell to either 0 (clean) or 1 (dirty).
5. Print the state of the room after randomly assigning dirt to certain cells.
6. Initialize variables **x**, **y**, and **z** to track the position within the room and the number of cleaned cells.
7. Iterate over each cell in the room using nested loops:
   * If the cell contains dirt (value 1), print a message indicating the vacuum is in that location and clean the cell by setting its value to 0. Increment the **z** variable to count the number of cleaned cells.
8. Calculate the performance by determining the percentage of cells cleaned.
9. Print the final state of the room, indicating that it's clean now.
10. Print the performance percentage.

CODE:

import random

def display(room):

print(room)

room = [

[1, 1, 1, 1],

[1, 1, 1, 1],

[1, 1, 1, 1],

[1, 1, 1, 1],

]

print("All the rooom are dirty")

display(room)

x =0

y= 0

while x < 4:

while y < 4:

room[x][y] = random.choice([0,1])

y+=1

x+=1

y=0

print("Before cleaning the room I detect all of these random dirts")

display(room)

x =0

y= 0

z=0

while x < 4:

while y < 4:

if room[x][y] == 1:

print("Vaccum in this location now,",x, y)

room[x][y] = 0

print("cleaned", x, y)

z+=1

y+=1

x+=1

y=0

pro= (100-((z/16)\*100))

print("Room is clean now, Thanks for using : 3710933")

display(room)

print('performance=',pro,'%')

OUTPUT:

All the rooom are dirty

[[1, 1, 1, 1], [1, 1, 1, 1], [1, 1, 1, 1], [1, 1, 1, 1]]

Before cleaning the room I detect all of these random dirts

[[0, 1, 0, 0], [1, 1, 1, 1], [1, 0, 1, 1], [1, 0, 1, 0]]

Vaccum in this location now, 0 1

cleaned 0 1

Vaccum in this location now, 1 0

cleaned 1 0

Vaccum in this location now, 1 1

cleaned 1 1

Vaccum in this location now, 1 2

cleaned 1 2

Vaccum in this location now, 1 3

cleaned 1 3

Vaccum in this location now, 2 0

cleaned 2 0

Vaccum in this location now, 2 2

cleaned 2 2

Vaccum in this location now, 2 3

cleaned 2 3

Vaccum in this location now, 3 0

cleaned 3 0

Vaccum in this location now, 3 2

cleaned 3 2

Room is clean now, Thanks for using : 3710933

[[0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0]]

performance= 37.5 %