Artificial Intelligence

Lab: 6

Write a program for a simple reflex agent. The agent will act as a vacuum cleaner. In the first activity, wewill create an environment for the agent.

- The environment is divided into 4 portions A,B,C and D.
- Then define two states for each portion.
- 0 indicates the cleaned state and 1 indicates the dirty state.
- We will initialize each portion with a random state that would be either 0 or 1.

Code:

```
import random class

Environment:   def

__init__(self):

   self.locationCondition={

      'A': random.randint(0,1),

      'B':random.randint(0,1),

'C':random.randint(0,1),

      'D':random.randint(0,1)


   }

class SimpleReflexVacumAgent:

def __init__(self,environment):

self.environment=environment

   self.score=0

   self.vaccumLocation= random.randint(0,3)


   print("Initial environment condition", self.environment.locationCondition);
```

```
   if self.vaccumLocation==0:            print("Vacum is
randomnly placed at location A");
            self.clean_location('A')
            self.move_and_clean('B')
self.move_and_clean('C')
self.move_and_clean('D')

   elif self.vaccumLocation==1:          print("Vacum is
randomnly placed at location B");
          self.clean_location('B')
self.move_and_clean('A')
self.move_and_clean('C')
self.move_and_clean('D')

   elif self.vaccumLocation==2:          print("Vacum is
randomnly placed at location C");
          self.clean_location('C')
self.move_and_clean('A')
self.move_and_clean('B')
self.move_and_clean('D')
   else:
          print("Vacum is randomnly placed at location
D");
          self.clean_location('D')
self.move_and_clean('A')
self.move_and_clean('B')
self.move_and_clean('C')
```

```
    print("final environment condition", self.environment.locationCondition)
print("performance measure",  str(self.score))


  def clean_location(self,location):
    print(f"Location {location} is {'Dirty' if self.environment.locationCondition[location]==1
else 'Clean'}")
    if self.environment.locationCondition[location]==1:
self.environment.locationCondition[location]==0
        self.score +=1
        print(f"Location {location} has been cleaned")
    else:
      print(f"Location {location} has already clean")


  def move_and_clean(self,location):
   print(f"Moving to Location {location}.....")
self.clean_location(location)

theEnvironment = Environment() theVacum =
SimpleReflexVacumAgent(theEnvironment)
```

Output:

```
theEnvironment = Environment()
theVacum = SimpleReflexVacumAgent(theEnvironment)
```

```
Initial environment condition {'A': 1, 'B': 0, 'C': 0, 'D': 1}
Vacum is randomnly placed at location C
Location C is Clean
Location C has already clean
Moving to Location A.....
Location A is Dirty
Location A has been cleaned
Moving to Location B.....
Location B is Clean
Location B has already clean
Moving to Location D.....
Location D is Dirty
Location D has been cleaned
final environment condition {'A': 1, 'B': 0, 'C': 0, 'D': 1}
performance measure 2
```