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#!/usr/bin/env python
# coding: utf-8
#.py file
#AI Lab Assignment1

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import random
a=random.randint(0,1)#Randomly positioning Vaccum Cleaner
Room=["A","B"]#a=0 -> A and a=1 -> B
Roomstate={Room[0]:random.randint(0,1),Room[1]:random.randint(0,1)} #1 is dirty,0 is clean
swap={0:1,1:0}#swap dict to switch rooms pointer
Operation=["None.","Suck.","Move Right.","Move Left."]



def AgentFunction(Operationindex):
    """The agent function is a mathematical function
    that maps a sequence of perceptions into action."""

    print("\tOperation: "+Operation[Operationindex])



def AgentProgram(a,Room,Roomastate):
    """"an agent program is a real implementation of an
    agent function. In other words, it implements an
    agent function which maps percepts to actions."""

    if Roomstate[Room[a]]==1:
        print("Location: "+Room[a])
        print("Room "+Room[a]+" is dirty.")
        AgentFunction(Operationindex=1)
        if Roomstate[Room[swap[a]]]==1:
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        print("Room "+Room[swap[a]]+" is dirty.")
        if a==0:
            AgentFunction(Operationindex=2)
            a=swap[a]
            print("Location: "+Room[a])
            AgentFunction(Operationindex=1)
        else:
            AgentFunction(Operationindex=3)
            a=swap[a]
            print("Location: "+Room[a])
            AgentFunction(Operationindex=1)

    else:
        print("Room "+Room[swap[a]]+" is clean.")
        AgentFunction(Operationindex=0)
else:
    print("Location: "+Room[a])
    print("Room "+Room[a]+" is clean.")
    AgentFunction(Operationindex=0)
    if Roomstate[Room[swap[a]]]==1:
        print("Room "+Room[swap[a]]+" is dirty.")
        if a==0:
            AgentFunction(Operationindex=2)
            a=swap[a]
            print("Location: "+Room[a])
            AgentFunction(Operationindex=1)
        else:
            AgentFunction(Operationindex=3)
            a=swap[a]
            print("Location: "+Room[a])
            AgentFunction(Operationindex=1)
    else:
        print("Room "+Room[swap[a]]+" is clean.")
        AgentFunction(Operationindex=0)
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    return a #returning the location for next iteration.


#Main function

#Number of times vaccum cleaner works
n=int(input("Enter the number of Cleaning iterations: "))
for i in range(n):
    print("\nIteration "+str(i+1))
    a=AgentProgram(a,Room,Roomstate)
    #Re-initialising states of rooms after an iteration.
    Roomstate[Room[0]]=random.randint(0,1)
    Roomstate[Room[1]]=random.randint(0,1)

"""
Output: n=15.

Enter the number of Cleaning iterations: 15

Iteration 1
Location: A
Room A is dirty.
     Operation: Suck.
Room B is clean.
     Operation: None.

Iteration 2
Location: A
Room A is clean.
     Operation: None.
Room B is clean.
     Operation: None.
```

Iteration 3

Location: A

Room A is clean.

Operation: None.

Room B is dirty.

Operation: Move Right.

Location: B

Operation: Suck.

Iteration 4

Location: B

Room B is dirty.

Operation: Suck.

Room A is clean.

Operation: None.

Iteration 5

Location: B

Room B is dirty.

Operation: Suck.

Room A is clean.

Operation: None.

Iteration 6

Location: B

Room B is dirty.

Operation: Suck.

Room A is clean.

Operation: None.

Iteration 7

Location: B

Room B is dirty.

Operation: Suck.

Room A is clean.

Operation: None.

Iteration 8

Location: B

Room B is clean.

Operation: None.

Room A is dirty.

Operation: Move Left.

Location: A

Operation: Suck.

Iteration 9

Location: A

Room A is clean.

Operation: None.

Room B is dirty.

Operation: Move Right.

Location: B

Operation: Suck.

Iteration 10

Location: B

Room B is clean.

Operation: None.

Room A is clean.

Operation: None.

Iteration 11

Location: B

Room B is dirty.

Operation: Suck.

Room A is clean.

Operation: None.

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Iteration 12
Location: B
Room B is dirty.
     Operation: Suck.
Room A is dirty.
     Operation: Move Left.
Location: A
     Operation: Suck.

Iteration 13
Location: A
Room A is clean.
     Operation: None.
Room B is clean.
     Operation: None.

Iteration 14
Location: A
Room A is dirty.
     Operation: Suck.
Room B is clean.
     Operation: None.

Iteration 15
Location: A
Room A is clean.
     Operation: None.
Room B is dirty.
     Operation: Move Right.
Location: B
     Operation: Suck.

"""
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