Name: Dillon Kanai
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Function definitions:

1. **Explanation of defined functions**

Init(self, L, R, P):

This function is the class's "constructor". It is called by the main function and not called by the creation of the instance of this class. It takes 4 inputs: self, and 3 ints. The first two ints represent the state of the left and right tiles. 0 means the tile is clean and 1 means the tile is dirty. The third int represents where the agent is: 0 is left, 1 is right. These are all put in an array called state, which will keep data on the current state.

checkfloor(self):

This function is purely for the user to see the status of the entire floor. Using the state array, it prints a bunch of statements that tell what is clean and where the robot is.

scan(self):
This function checks to see if both tiles are clean. If they are both clean, the function returns true, which will terminate the while loop in the main function.

left(self), right(self):

These functions change the value of the third value in the state array, the location of the robot. If the robot is already on the left side when left() is called, nothing will happen. Same with right().

clean(self):
This function will change the first two values in the state array. If the state of a tile is already 0, nothing will happen. If the state of a tile is 1, it will be changed to a 0 and will print a statement.

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2. **Explanation of test cases**

The array the shows the list of moves shows the first move on the right and the last move on the left.

```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 1
Dirty(1) or clean(0) for right side: 1
Right(1) or Left(0) for inital robot position: 1
-------------------------------------------------------
You are on the right!
The floor is dirty!
Tile is now clean!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are now on the left side!
-------------------------------------------------------
You are on the left!
The floor is dirty!
Tile is now clean!
Floor is now Clean!
5
['Clean', 'Right', 'Right', 'Left', 'Clean']
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

In this case, both tiles are dirty and the robot is on the right. The robot first cleans the right spot, moves to the right twice (which did nothing), moves left, then cleans. Both tiles are clean.

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```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 1
Dirty(1) or clean(0) for right side: 1
Right(1) or Left(0) for inital robot position: 0
-----------------------------------------------------
You are on the left!
The floor is dirty!
You are now on the right side!
-----------------------------------------------------
You are on the right!
The floor is dirty!
You are already on the right tile!
-----------------------------------------------------
You are on the right!
The floor is dirty!
Tile is now clean!
-----------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
-----------------------------------------------------
You are on the right!
The floor is clean!
You are now on the left side!
-----------------------------------------------------
You are on the left!
The floor is dirty!
Tile is now clean!
Floor is now Clean!
6
['Right', 'Right', 'Clean', 'Right', 'Left', 'Clean']
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

The robot starts on the left and both tiles are dirty. The robot moves to the right twice, cleans the right tile, moves left, then cleans the left tile. Both tiles are clean.

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```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 1
Dirty(1) or clean(0) for right side: 0
Right(1) or Left(0) for inital robot position: 1
-------------------------------------------------------
You are on the right!
The floor is clean!
Tile is already clean!
-------------------------------------------------------
You are on the right!
The floor is clean!
Tile is already clean!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are now on the left side!
-------------------------------------------------------
You are on the left!
The floor is dirty!
You are now on the right side!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is clean!
You are now on the left side!
-------------------------------------------------------
You are on the left!
The floor is dirty!
You are already on the left tile!
-------------------------------------------------------
You are on the left!
The floor is dirty!
Tile is now clean!
Floor is now Clean!
9
['Clean', 'Clean', 'Right', 'Left', 'Right', 'Right', 'Left', 'Left', 'Clean']
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

Left tile is dirty and the right tile is clean. The robot starts on the right, cleans right tile twice (does nothing), moves right (does nothing), moves left, then right twice, then left twice, then cleans left tile. Both tiles are clean.

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```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 1
Dirty(1) or clean(0) for right side: 0
Right(1) or Left(0) for inital robot position: 0
----------------------------------------------------------
You are on the left!
The floor is dirty!
You are now on the right side!
----------------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
----------------------------------------------------------
You are on the right!
The floor is clean!
You are already on the right tile!
----------------------------------------------------------
You are on the right!
The floor is clean!
Tile is already clean!
----------------------------------------------------------
You are on the right!
The floor is clean!
Tile is already clean!
----------------------------------------------------------
You are on the right!
The floor is clean!
You are now on the left side!
----------------------------------------------------------
You are on the left!
The floor is dirty!
You are now on the right side!
----------------------------------------------------------
You are on the right!
The floor is clean!
You are now on the left side!
----------------------------------------------------------
You are on the left!
The floor is dirty!
You are already on the left tile!
----------------------------------------------------------
You are on the left!
The floor is dirty!
You are already on the left tile!
----------------------------------------------------------
You are on the left!
The floor is dirty!
Tile is now clean!
Floor is now Clean!
11
['Right', 'Right', 'Right', 'Clean', 'Clean', 'Left', 'Right', 'Left', 'Left', 'Left', 'Clean']
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

The robot starts on the left. The left tile is dirty and the right tile is clean. The robot moves right three times, cleans twice (does nothing), moves left, moves right, moves left three times, cleans left tile. Both tiles are clean.

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```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 0
Dirty(1) or clean(0) for right side: 1
Right(1) or Left(0) for inital robot position: 1
-------------------------------------------------------
You are on the right!
The floor is dirty!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is dirty!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is dirty!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is dirty!
You are already on the right tile!
-------------------------------------------------------
You are on the right!
The floor is dirty!
Tile is now clean!
Floor is now Clean!
5
['Right', 'Right', 'Right', 'Right', 'Clean']
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

The robot starts on the right. Left tile is clean and the right tile is dirty. The robot moves to the right tile and cleans it. Both tiles are clean.

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```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 0
Dirty(1) or clean(0) for right side: 1
Right(1) or Left(0) for inital robot position: 0
-----------------------------------------------------
You are on the left!
The floor is clean!
You are already on the left tile!
-----------------------------------------------------
You are on the left!
The floor is clean!
You are already on the left tile!
-----------------------------------------------------
You are on the left!
The floor is clean!
You are now on the right side!
-----------------------------------------------------
You are on the right!
The floor is dirty!
You are already on the right tile!
-----------------------------------------------------
You are on the right!
The floor is dirty!
You are now on the left side!
-----------------------------------------------------
You are on the left!
The floor is clean!
You are already on the left tile!
-----------------------------------------------------
You are on the left!
The floor is clean!
You are now on the right side!
-----------------------------------------------------
You are on the right!
The floor is dirty!
Tile is now clean!
Floor is now Clean!
8
['Left', 'Left', 'Right', 'Right', 'Left', 'Left', 'Right', 'Clean']
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

The left tile is clean and the right tile is dirty. The robot starts on the left. The robot moves left twice (does nothing), moves right, moves left, then moves right. Finally, it cleans the right tile. Both tiles are dirty.

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```
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 0
Dirty(1) or clean(0) for right side: 0
Right(1) or Left(0) for inital robot position: 1
Floor is now Clean!
0
[]
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2> py main.py
Dirty(1) or clean(0) for left side: 0
Dirty(1) or clean(0) for right side: 0
Right(1) or Left(0) for inital robot position: 0
Floor is now Clean!
0
[]
PS C:\Users\Dillon\Desktop\CodeStuff\Python\COEN166\Lab2>
```

In both cases, both tiles are clean. Which position the robot is in is irrelevant; both tiles are clean at the start.

Name: Dillon Kanai
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```python
#Name: Dillon Kanai
#Date: 9/29/20
#Lab 2
#main.py

from vacuum import *
import random
if __name__ == "__main__":
    room = Room()
    L = int(input("Dirty(1) or clean(0) for left side: "))
    R = int(input("Dirty(1) or clean(0) for right side: "))
    P = int(input("Right(1) or Left(0) for inital robot position: "))
    list = []
    score = 0
    choice = -1
    room.init(L, R, P)

    finished = False
    finished = room.scan()
    while(not finished):
        print("-------------------------------------------------------")
        room.checkfloor()
        #Select Action: Go left(0), Go right(1), Clean(2)
        choice = int(random.random()*3)
        score += 1
        if (choice == 0):
            room.left()
            list.append("Left")
        elif (choice == 1):
            room.right()
            list.append("Right")
        else:
            room.clean()
            list.append("Clean")
        finished = room.scan()

    print("Floor is now Clean!")
    print(score)
    print(list)
```

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```
#Name: Dillon Kanai
#Date: 9/29/20
#Lab 2
#vacuum.py


#1 means floor is dirty
#0 means floor is clean
#state[0] is the left tile state
#state[1] is the right tile state
#state[2] is the position robot is in: 0 = left, 1 = right
class Room:
    def init(self, L, R, P):
        self.state = [L, R, P]

    def checkfloor(self):
        if (self.state[2]):
            print("You are on the right!")
            if (self.state[1]):
                print("The floor is dirty!")
            else:
                print("The floor is clean!")
        else:
            print("You are on the left!")
            if (self.state[0]):
                print("The floor is dirty!")
            else:
                print("The floor is clean!")

    def scan(self):
        if (self.state[0] == 1):
            return False
        if (self.state[1] == 1):
            return False
        return True

    def left(self):
        if (self.state[2] == 0):
            print("You are already on the left tile!")
        else:
            print("You are now on the left side!")
            self.state[2] = 0
```

```
def right(self):
    if (self.state[2] == 1):
        print("You are already on the right tile!")
    else:
        print("You are now on the right side!")
        self.state[2] = 1

def clean(self):
    pos = self.state[2]
    if (self.state[pos] == 1):
        print("Tile is now clean!")
        self.state[pos] = 0
    else:
        print("Tile is already clean!")
```