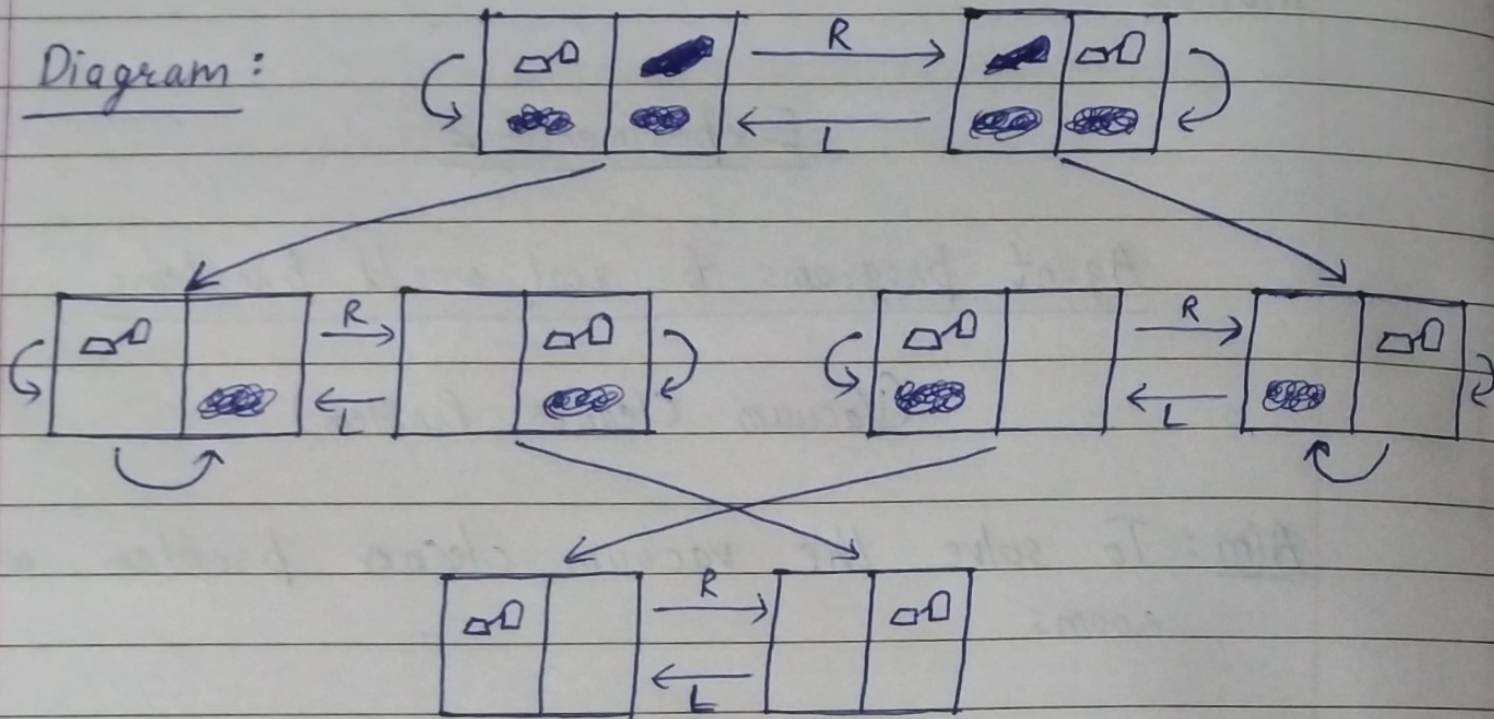## Experiment - 2

Agent programs for real world problems

(Vacuum Cleaner Problem)

Aim: To solve the vacuum cleaner problem with 2 rooms

Steps: 1) Set the goal state as both rooms clean, input the state of both rooms and location of vacuum cleaner. Set the cost as 0.

2) Check the location of vacuum cleaner (say A) and the status of that room (say dirty). If the room is 'dirty', increase cost by 1, set the status of as 'clean'. ~~and move to o~~ If the room is clean, don't change the cost.

~~3) Move to othe~~

3) Check if other room is clean/dirty. If the room is 'dirty', move to that room and increase cost by 1, clean that room and increase cost by 1, and change the status of that room to 'clean'.

4) Report the final cost.

Diagram:

Result: This program has been successfully executed in Python language.

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Code

```
goal_state = {'A': 'clean', 'B': 'dirty'}
cost = 0

location_input = input("Enter Location of Vacuum ")
status_input = input("Enter status of " + location_input + " ")
status_input_complement = input("Enter status of other room ")

if location_input == 'A':
    print("Vacuum is placed in Location A")
    if status_input == 'dirty':
        print("Location A is Dirty.")
        goal_state['A'] = 'clean'
        cost += 1
        print("Cost for CLEANING A = 1")
        print("Location A has been Cleaned.")

        if status_input_complement == 'dirty':
            print("Location B is Dirty.")
            print("Moving right to the Location B. ")
            cost += 1
            print("COST for moving RIGHT = 1")
            goal_state['B'] = 'clean'
            cost += 1
            print("COST for CLEANING = 1")
            print("Location B has been Cleaned. ")
        else:
            print("No action")
            print("Location B is already clean.")

    if status_input == 'clean':
        print("Location A is already clean ")
        if status_input_complement == 'dirty':
            print("Location B is Dirty.")
            print("Moving RIGHT to the Location B. ")
            cost += 1
            print("COST for moving RIGHT = 1")
            goal_state['B'] = 'clean'
            cost += 1
            print("Cost for CLEANING = 1")
            print("Location B has been Cleaned. ")
        else:
            print("No action")
            print(cost)
            print("Location B is already clean.")

else:
    print("Vacuum is placed in location B")
    if status_input == 'dirty':
        print("Location B is Dirty.")
        goal_state['B'] = 'clean'
        cost += 1
```

```python
        print("COST for CLEANING = 1")
        print("Location B has been Cleaned.")

        if status_input_complement == 'dirty':
            print("Location A is Dirty.")
            print("Moving LEFT to the Location A. ")
            cost += 1
            print("COST for moving LEFT = 1")
            goal_state['A'] = 'clean'
            cost += 1
            print("COST for CLEANING = 1")
            print("Location A has been Cleaned.")

    else:
        print(cost)
        print("Location B is already clean.")

        if status_input_complement == 'dirty':
            print("Location A is Dirty.")
            print("Moving LEFT to the Location A. ")
            cost += 1
            print("COST for moving LEFT = 1")
            goal_state['A'] = 'clean'
            cost += 1
            print("Cost for CLEANING = 1")
            print("Location A has been Cleaned. ")
        else:
            print("No action")
            print("Location A is already clean.")

print("Both locations are clean.")
print("Final Cost: " + str(cost))
```

Output

```
Enter Location of Vacuum A
Enter status of A dirty
Enter status of other room dirty
Vacuum is placed in Location A
Location A is Dirty.
Cost for CLEANING A = 1
Location A has been Cleaned.
Location B is Dirty.
Moving right to the Location B.
COST for moving RIGHT = 1
COST for CLEANING = 1
Location B has been Cleaned.
Both locations are clean.
Final Cost: 3
```

```
Enter Location of Vacuum B
Enter status of B dirty
Enter status of other room dirty
Vacuum is placed in location B
Location B is Dirty.
COST for CLEANING = 1
Location B has been Cleaned.
Location A is Dirty.
Moving LEFT to the Location A.
COST for moving LEFT = 1
COST for CLEANING = 1
Location A has been Cleaned.
Both locations are clean.
Final Cost: 3
```

```
Enter Location of Vacuum A
Enter status of A dirty
Enter status of other room clean
Vacuum is placed in Location A
Location A is Dirty.
Cost for CLEANING A = 1
Location A has been Cleaned.
No action
Location B is already clean.
Both locations are clean.
Final Cost: 1
```

```
Enter Location of Vacuum A
Enter status of A clean
Enter status of other room dirty
Vacuum is placed in Location A
Location A is already clean
Location B is Dirty.
Moving RIGHT to the Location B.
COST for moving RIGHT = 1
Cost for CLEANING = 1
Location B has been Cleaned.
Both locations are clean.
Final Cost: 2
```

```
Enter Location of Vacuum B
Enter status of B dirty
Enter status of other room clean
Vacuum is placed in location B
Location B is Dirty.
COST for CLEANING = 1
Location B has been Cleaned.
Both locations are clean.
Final Cost: 1
```

```
Enter Location of Vacuum B
Enter status of B clean
Enter status of other room dirty
Vacuum is placed in location B
0
Location B is already clean.
Location A is Dirty.
Moving LEFT to the Location A.
COST for moving LEFT = 1
Cost for CLEANING = 1
Location A has been Cleaned.
Both locations are clean.
Final Cost: 2
```