LAB 2:

Implementation of Vacuum Cleaner

Code:

```python
print("Santhosh N (USN : 1BM23CS302)")

def vacuum_cleaner():
    cost = 0


    state_A = int(input("Enter state of A (0 for clean, 1 for dirty): "))
    state_B = int(input("Enter state of B (0 for clean, 1 for dirty): "))
    state_C = int(input("Enter state of B (0 for clean, 1 for dirty): "))
    state_D = int(input("Enter state of B (0 for clean, 1 for dirty): "))
    location = input("Enter location (A or B or C or D): ").upper()


    def both_clean():
        return state_A == 0 and state_B == 0 and state_C == 0 and state_D == 0

    if both_clean():
        print("all rooms are clean")
        print("Turning vacuum off")
    else:
        if location == 'A':
            if state_A == 1:
                print("Cleaned A.")
                cost += 1
                state_A = 0
            else:
                print("A is clean")

            if state_B == 1:
                print("Moving vacuum to room B")
                print("Cleaned B.")
                cost += 1
                state_B = 0
            else:
                print("B is clean")

            if state_C == 1:
                print("Moving vacuum to room C")
```

```python
        print("Cleaned C.")
        cost+=1
        state_C = 0
    else:
        print("C is clean")

    if state_D == 1:
        print("Moving vacuum to room D")
        print("Cleaned D.")
        cost+=1
        state_D = 0
    else:
        print("D is clean")


    a_clean = int(input("Is A clean now? (0 if clean, 1 if dirty): "))
    state_A = a_clean


    b_dirty = int(input("Is B dirty? (0 if clean, 1 if dirty): "))
    state_B = b_dirty


    c_dirty = int(input("Is C dirty? (0 if clean, 1 if dirty): "))
    state_C = c_dirty


    d_dirty = int(input("Is D dirty? (0 if clean, 1 if dirty): "))
    state_D = d_dirty

    if state_A == 0 and state_B == 0 and state_C == 0 and state_D == 0:
        print("all rooms are clean")
    if state_A == 1:
        print("Room A is dirty")
    if state_B == 1:
        print("Room B is dirty")
    if state_C == 1:
        print("Room C is dirty")
    if state_D == 1:
        print("Room D is dirty")
    print("vacuum turning off")

elif location == 'B':
    if state_B == 1:
```

```python
        print("Cleaned B.")
        cost += 1
        state_B = 0
    else:
        print("B is clean")

    if state_A == 1:
        print("Moving vacuum to room A")
        print("Cleaned A.")
        cost += 1
        state_A = 0
    else:
        print("A is clean")

    if state_C == 1:
        print("Moving vacuum to room C")
        print("Cleaned C.")
        cost+=1
        state_C = 0
    else:
        print("C is clean")

    if state_D == 1:
        print("Moving vacuum to room D")
        print("Cleaned D.")
        cost+=1
        state_D = 0
    else:
        print("D is clean")


    a_clean = int(input("Is A clean now? (0 if clean, 1 if dirty): "))
    state_A = a_clean


    b_dirty = int(input("Is B dirty? (0 if clean, 1 if dirty): "))
    state_B = b_dirty


    c_dirty = int(input("Is C dirty? (0 if clean, 1 if dirty): "))
    state_C = c_dirty


    d_dirty = int(input("Is D dirty? (0 if clean, 1 if dirty): "))
```

```python
        state_D = d_dirty

        if state_A == 0 and state_B == 0 and state_C == 0 and state_D == 0:
            print("all rooms are clean")
        if state_B == 1:
            print("Room B is dirty")
        if state_A == 1:
            print("Room A is dirty")
        if state_C == 1:
            print("Room C is dirty")
        if state_D == 1:
            print("Room D is dirty")
        print("vacuum turning off")

    elif location == 'C':
        if state_B == 1:
            print("Moving vacuum to room B")
            print("Cleaned B.")
            cost += 1
            state_B = 0
        else:
            print("B is clean")

        if state_A == 1:
            print("Moving vacuum to room A")
            print("Cleaned A.")
            cost += 1
            state_A = 0
        else:
            print("A is clean")

        if state_C == 1:
            print("Cleaned C.")
            cost+=1
            state_C = 0
        else:
            print("C is clean")

        if state_D == 1:
            print("Moving vacuum to room D")
            print("Cleaned D.")
            cost+=1
            state_D = 0
        else:
```

```python
        print("D is clean")


    a_clean = int(input("Is A clean now? (0 if clean, 1 if dirty): "))
    state_A = a_clean


    b_dirty = int(input("Is B dirty? (0 if clean, 1 if dirty): "))
    state_B = b_dirty


    c_dirty = int(input("Is C dirty? (0 if clean, 1 if dirty): "))
    state_C = c_dirty


    d_dirty = int(input("Is D dirty? (0 if clean, 1 if dirty): "))
    state_D = d_dirty

    if state_A == 0 and state_B == 0 and state_C == 0 and state_D == 0:
        print("all rooms are clean")
    if state_C == 1:
        print("Room C is dirty")
    if state_A == 1:
        print("Room A is dirty")
    if state_B == 1:
        print("Room B is dirty")
    if state_D == 1:
        print("Room D is dirty")

    print("vacuum turning off")

elif location == 'D':
    if state_B == 1:
        print("Moving vacuum to room B")
        print("Cleaned B.")
        cost += 1
        state_B = 0
    else:
        print("B is clean")

    if state_A == 1:
        print("Moving vacuum to room A")
        print("Cleaned A.")
        cost += 1
```

```python
        state_A = 0
    else:
        print("A is clean")

    if state_C == 1:
        print("Moving vacuum to room C")
        print("Cleaned C.")
        cost+=1
        state_C = 0
    else:
        print("C is clean")

    if state_D == 1:
        print("Cleaned D.")
        cost+=1
        state_D = 0
    else:
        print("D is clean")


    a_clean = int(input("Is A clean now? (0 if clean, 1 if dirty): "))
    state_A = a_clean


    b_dirty = int(input("Is B dirty? (0 if clean, 1 if dirty): "))
    state_B = b_dirty


    c_dirty = int(input("Is C dirty? (0 if clean, 1 if dirty): "))
    state_C = c_dirty


    d_dirty = int(input("Is D dirty? (0 if clean, 1 if dirty): "))
    state_D = d_dirty

    if state_A == 0 and state_B == 0 and state_C == 0 and state_D == 0:
        print("all rooms are clean")
    if state_A == 1:
        print("Room A is dirty")
    if state_B == 1:
        print("Room B is dirty")
    if state_C == 1:
        print("Room C is dirty")
    if state_D == 1:
```

```
            print("Room D is dirty")
        print("vacuum turning off")

    print(f"Cost: {cost}")
    print({'A': state_A, 'B': state_B, 'C': state_C, 'D': state_D})


vacuum_cleaner()
```

Output:

```
= RESTART: C:/Users/student/AppData/Local/Programs/Python/Python313/302/lab2.py
Santhosh N (USN : 1BM23CS302)
Enter state of A (0 for clean, 1 for dirty): 0
Enter state of B (0 for clean, 1 for dirty): 0
Enter state of B (0 for clean, 1 for dirty): 0
Enter state of B (0 for clean, 1 for dirty): 0
Enter location (A or B or C or D): a
Turning vacuum off
Cost: 0
{'A': 0, 'B': 0, 'C': 0, 'D': 0}

= RESTART: C:/Users/student/AppData/Local/Programs/Python/Python313/302/lab2.py
Santhosh N (USN : 1BM23CS302)
Enter state of A (0 for clean, 1 for dirty): 1
Enter state of B (0 for clean, 1 for dirty): 1
Enter state of B (0 for clean, 1 for dirty): 1
Enter state of B (0 for clean, 1 for dirty): 1
Enter location (A or B or C or D): a.
Cost: 0
{'A': 1, 'B': 1, 'C': 1, 'D': 1}
```

```
= RESTART: C:/Users/student/AppData/Local/Programs/Python/Python313/302/lab2.py
Santhosh N (USN : 1BM23CS302)
Enter state of A (0 for clean, 1 for dirty): 1
Enter state of B (0 for clean, 1 for dirty): 1
Enter state of B (0 for clean, 1 for dirty): 1
Enter state of B (0 for clean, 1 for dirty): 1
Enter location (A or B or C or D): a
Cleaned A.
Moving vacuum to room B
Cleaned B.
Moving vacuum to room C
Cleaned C.
Moving vacuum to room D
Cleaned D.
Is A clean now? (0 if clean, 1 if dirty): 1
Is B dirty? (0 if clean, 1 if dirty): 1
Is C dirty? (0 if clean, 1 if dirty): 1
Is D dirty? (0 if clean, 1 if dirty): 1
Room A is dirty
Room B is dirty
Room C is dirty
Room D is dirty
vacuum turning off
Cost: 4
{'A': 1, 'B': 1, 'C': 1, 'D': 1}
```