Implementation of vacuum world cleaner in python

Two quadrants

```
goal = ['A', 1, 'B', 1]

battery_level = int(input("Enter the battery level: "))

room_location = input("Enter the room location A or B: ")

status = int(input("Enter status of the room (0 for clean, 1 for dirty): "))

other_room = int(input("Enter other room status (0 or 1): "))

cost = 0

def clean_room(location, room_status, room_index):

global battery_level, cost, goal

if room_status == 0:

print(f"Location {location} is already clean")

else:

print(f"Location {location} is dirty")

cost += 1

goal[room_index] = 0  # Update the goal state to clean (0)

print(f"Location {location} has been cleaned")

battery_level -= 1

if battery_level > 0:

if room_location == 'A':

goal[1], goal[3] = status, other_room

print(f"Initial Goal state {goal}\nVacuum is placed in Location A")

if battery_level > 0:

clean_room('A', status, 1)

print("Moving to Location B")

clean_room('B', other_room, 3)

elif room_location == 'B':

goal[3], goal[1] = status, other_room
```

```
print(f"Initial Goal state {goal}\nVacuum is placed in Location B")
if battery_level > 0:
clean_room('B', status, 3)
print("Moving to Location A")
clean_room('A', other_room, 1)
print(f"Goal state is {goal} \nCost for suck is {cost}")
else:
print("Invalid input or Battery Low!")
```

Output:

```
Enter the battery level: 2
Enter the room location A or B: A
Enter status of the room (0 for clean, 1 for dirty): 1
Enter other room status (0 or 1): 1
Initial Goal state ['A', 1, 'B', 1]
Vacuum is placed in Location A
Location A is dirty
Location A has been cleaned
Moving to Location B
Location B is dirty
Location B has been cleaned
Goal state is ['A', 0, 'B', 0]
Cost for suck is 2
```

Four Quadrants

```
# Initialize the goal state for four rooms
goal = ['A', 1, 'B', 1, 'C', 1, 'D', 1]  # Structure: [Room, Status, Room, Status, Room, Status, Room, Status]
# Get user inputs for room locations and their statuses
room_location = input("Enter the room location A, B, C, or D: ")
status = int(input("Enter status of the room 0 for clean or 1 for dirty: "))
other_rooms_status = []
# Get the status of the other three rooms
for room in ['A', 'B', 'C', 'D']:
if room != room_location:
other_rooms_status.append(int(input(f"Enter status of room {room} (0 for clean, 1 for dirty): ")))
cost = 0
# Update the goal based on the current room's status
if room_location == 'A':
goal[1] = status
goal[3], goal[5], goal[7] = other_rooms_status  # Update other rooms' statuses
print("Initial Goal state:", goal)
print("Vacuum is placed in Location A")
if status == 0:
print("Location A is already clean")
elif status == 1:
print("Location A is Dirty")
cost += 1
goal[1] = 0
print("Location A has been cleaned")
```

```
# Move to Location B
print("Moving right to Location B")
if goal[3] == 1:
print("Location B is Dirty")
cost += 1
goal[3] = 0
print("Location B has been cleaned")
else:
print("Location B is already clean")
# Move to Location C
print("Moving right to Location C")
if goal[5] == 1:
print("Location C is Dirty")
cost += 1
goal[5] = 0
print("Location C has been cleaned")
else:
print("Location C is already clean")

# Move to Location D
print("Moving right to Location D")
if goal[7] == 1:
print("Location D is Dirty")
cost += 1
goal[7] = 0
print("Location D has been cleaned")
else:
print("Location D is already clean")
```

```
elif room_location == 'B':
# Similar logic for room B
goal[3] = status
goal[1], goal[5], goal[7] = other_rooms_status  # Update other rooms' statuses
print("Initial Goal state:", goal)

print("Vacuum is placed in Location B")
if status == 0:
print("Location B is already clean")
elif status == 1:
print("Location B is Dirty")
cost += 1
goal[3] = 0
print("Location B has been cleaned")

# Move to Location A, C, and D similarly...
print("Moving left to Location A")
if goal[1] == 1:
print("Location A is Dirty")
cost += 1
goal[1] = 0
print("Location A has been cleaned")
else:
print("Location A is already clean")

print("Moving right to Location C")
if goal[5] == 1:
```

```
print("Location C is Dirty")

cost += 1

goal[5] = 0

print("Location C has been cleaned")

else:

print("Location C is already clean")


print("Moving right to Location D")

if goal[7] == 1:

print("Location D is Dirty")

cost += 1

goal[7] = 0

print("Location D has been cleaned")

else:

print("Location D is already clean")


elif room_location == 'C':

# Similar logic for room C

goal[5] = status

goal[1], goal[3], goal[7] = other_rooms_status  # Update other rooms' statuses

print("Initial Goal state:", goal)


print("Vacuum is placed in Location C")

if status == 0:

print("Location C is already clean")

elif status == 1:

print("Location C is Dirty")

cost += 1
```

```
goal[5] = 0
print("Location C has been cleaned")

# Move to Location A, B, and D similarly...
print("Moving left to Location B")
if goal[3] == 1:
print("Location B is Dirty")
cost += 1
goal[3] = 0
print("Location B has been cleaned")
else:
print("Location B is already clean")

print("Moving left to Location A")
if goal[1] == 1:
print("Location A is Dirty")
cost += 1
goal[1] = 0
print("Location A has been cleaned")
else:
print("Location A is already clean")

print("Moving right to Location D")
if goal[7] == 1:
print("Location D is Dirty")
cost += 1
goal[7] = 0
print("Location D has been cleaned")
```

```
else:
print("Location D is already clean")

elif room_location == 'D':
# Similar logic for room D
goal[7] = status
goal[1], goal[3], goal[5] = other_rooms_status  # Update other rooms' statuses
print("Initial Goal state:", goal)

print("Vacuum is placed in Location D")
if status == 0:
print("Location D is already clean")
elif status == 1:
print("Location D is Dirty")
cost += 1
goal[7] = 0
print("Location D has been cleaned")

# Move to Location C, B, and A similarly...
print("Moving left to Location C")
if goal[5] == 1:
print("Location C is Dirty")
cost += 1
goal[5] = 0
print("Location C has been cleaned")
else:
print("Location C is already clean")
print("Moving left to Location B")
if goal[3] == 1:
print("Location B is Dirty")
cost += 1
goal[3] = 0
print("Location B has been cleaned")
else:
print("Location B is already clean")

print("Moving left to Location A")
if goal[1] == 1:
print("Location A is Dirty")
cost += 1
goal[1] = 0
print("Location A has been cleaned")
else:
print("Location A is already clean")

else:
print("Invalid input")

# Final goal state and cost
print("Goal state is", goal)
print("Cost for suck is", cost)
```

Output:

```
Enter the room location A, B, C, or D: B

Enter status of the room 0 for clean or 1 for dirty: 1

Enter status of room A (0 for clean, 1 for dirty): 1

Enter status of room C (0 for clean, 1 for dirty): 0

Enter status of room D (0 for clean, 1 for dirty): 1

Initial Goal state: ['A', 1, 'B', 1, 'C', 0, 'D', 1]

Vacuum is placed in Location B

Location B is Dirty

Location B has been cleaned

Moving left to Location A

Location A is Dirty

Location A has been cleaned

Moving right to Location C

Location C is already clean

Moving right to Location D

Location D is Dirty

Location D has been cleaned

Goal state is ['A', 0, 'B', 0, 'C', 0, 'D', 0]

Cost for suck is 3
```