# Vacuum Cleaner Problem

## Python Code

# Define a simple environment for the vacuum cleaner  
# States: (Location, State of A, State of B)  
# Location: 'A' or 'B'; State: 'Clean' or 'Dirty'  
def vacuum\_cleaner():  
 actions = []  
 states = [('A', 'Dirty', 'Dirty')]  
  
 while states:  
 location, state\_A, state\_B = states.pop(0)  
 actions.append(f"Vacuum is at {location}. State: A={state\_A}, B={state\_B}")  
  
 if location == 'A':  
 if state\_A == 'Dirty':  
 actions.append("Suck dirt in A")  
 state\_A = 'Clean'  
 actions.append("Move to B")  
 states.append(('B', state\_A, state\_B))  
 elif location == 'B':  
 if state\_B == 'Dirty':  
 actions.append("Suck dirt in B")  
 state\_B = 'Clean'  
 actions.append("Move to A")  
 if state\_A == 'Clean' and state\_B == 'Clean':  
 actions.append("Both rooms are clean. Task complete.")  
 else:  
 states.append(('A', state\_A, state\_B))  
  
 return actions  
  
# Run the vacuum cleaner problem  
output\_actions = vacuum\_cleaner()  
for step in output\_actions:  
 print(step)

## Output (Vacuum Cleaner Actions)

Vacuum is at A. State: A=Dirty, B=Dirty

Suck dirt in A

Move to B

Vacuum is at B. State: A=Clean, B=Dirty

Suck dirt in B

Move to A

Both rooms are clean. Task complete.