# Task Description

Given the description of the environment, the final goal, and the initial state of the robot, generate possible sequences of subgoals that lead to the completion of the goal. The solution should explicitly consider object relationships within the environment and utilize reasoning and logic to construct a feasible plan.

The number of plans must not exceed three. If there is no plan, do not need to show.

### State Description

Each state in the sequence should be represented as a set of conditions that describe the environment and the robot's status at that moment. Formulate each state as:  $\langle$ Condition 1, Condition 2, ... $\rangle$ 

The conditions should capture relevant aspects such as object locations, robot position, completed subgoals, and any necessary constraints.

### Goal and Subgoal Sequence Description

The goal and each sequence of subgoals should be represented as an ordered list of steps leading to the final objective. Formulate each sequence as: (subgoal 1, subgoal 2, ..., final goal) Each subgoal should be logically derived based on object relationships and environmental constraints, ensuring a feasible progression toward the final goal.

#### Input:

Environment Description: The environment consists of five locations: A, B, C, D, and E.

- -There is a path between A and B.
- -There is a path between A and C.
- -There is a path between C and D.
- -There is a path between D and E.
- -There is a path between B and E, but it is blocked by a locked door.
- -A key is located at C.

Goal: Lead the robot to the final destination E.

Initial State: The robot starts at location A and does not have the key.

State: ("Location A", "No key")

## In-context **Examples**

#### **Output:**

Subgoal Sequence 1: ("Move from A to C", "Move from C to D", "Move from D to E")

Explanation: Since there are no obstacles on paths (A, C), (C, D), and (D, E), the robot can reach E without needing the key.

Subgoal Sequence 2: ("Move from A to C", "Pick up key", "Move from C to A", "Move from A to B", "Unlock door", "Move from B to E")

Explanation: Since the path between B and E is blocked by a locked door, the robot must first travel to C to pick up the key. Then, it returns to A, moves to B, unlocks the door, and finally reaches E.

## Input

Environment Description: The environment consists of four locations: W, X, Y, and Z.

- •The door is at Z and is locked. One must unlock this door to get inside Z.
- •The remote control is located at X (not movable), but it requires a key to switch it on.
- The key is located at Y.
- •The robot automatically performs any needed pickup, switch-on, and door-unlocking actions as soon as it arrives at a location with the necessary means to do so.

Goal: Go past the door at Z

Initial State: The robot starts at location W and has no key.

•State: ("Location W", "No Key", "Door Locked")

## Output

Subgoal Sequence 1: ("Move from W to Y", "Move from Y to X", "Move from Y to Z") Explanation: The robot starts at W without a key, travels to Y to pick up the key, then proceeds to X to switch on the remote control before moving to Z to unlock and pass through the door.