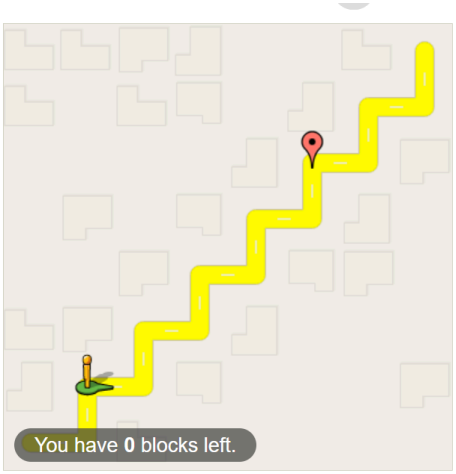
# Instructions

- Access the Blockly games and continue working through the Maze levels.
- For each documented problem:
    - **Problem Statement:** Clearly describe the specific task or challenge.
    - **Plan**: Outline your approach to solving the problem. Include steps that describe the sequence of actions needed.
    - **Algorithm/Pseudocode:** Write the algorithm or pseudocode for your solution.
    - **Screenshot**: Screenshot of the completed solution from Blockly
    - **Reflection**: Reflect on what you learned from solving this problem and how you applied computational thinking principles.

# Problem #1:

## Problem Statement:



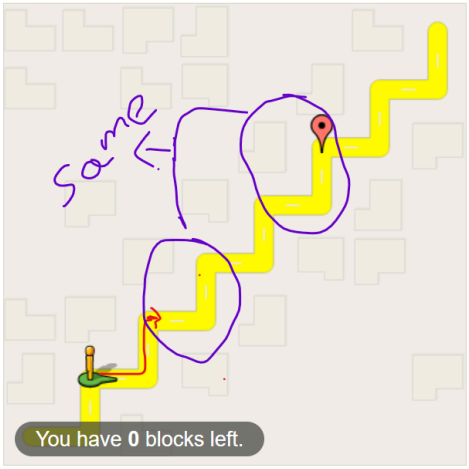

Perform the actions, so that the person can follow the yellow path to reach the destination.

## Plan:

- Find the path to follow, to reach the destination. In the given statement, we need to follow the yellow path in order to reach the destination.
- Figure out the actions to perform to traverse the path.To achieve that we need to perform the following actions:
    1. Move the person forward
    2. Take a left turn

3. Move the person forward
4. Take a right turn

Here we determine a pattern that steps required to move on the path are the same. So we perform the same actions sequentially over and over again until we reach the destination.



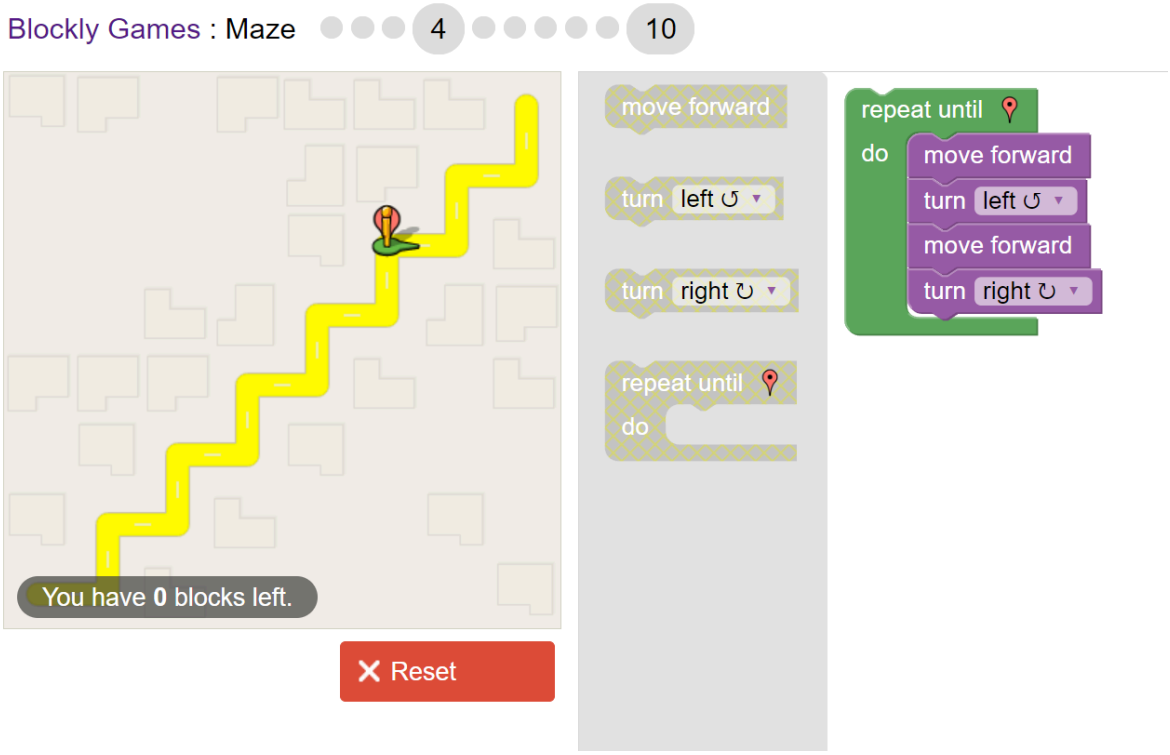

- Perform these actions and check if the person reached the destination.
- If the person has not reached the destination then retrace the steps and determine the actions to move in the right direction.
- Repeat them until the person reaches the destination.

## Algorithm:

Perform and repeat the steps in the sequential manner until the destination is reached:

- Move forward
- Turn Left
- Move forward
- Turn Right

## Screenshot:

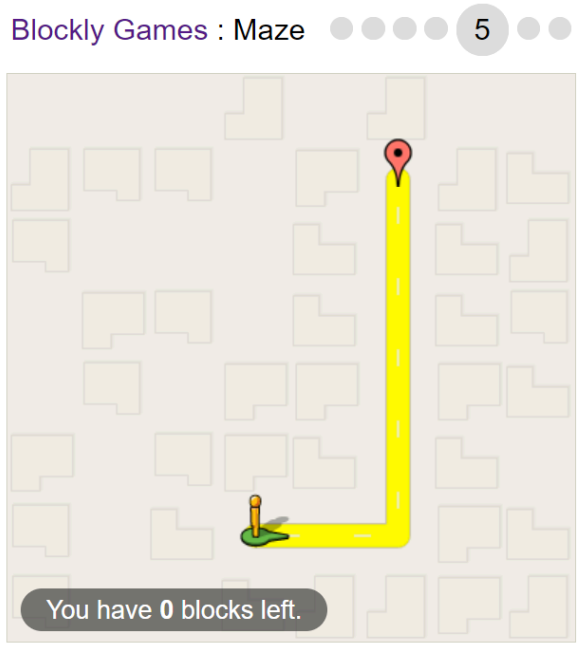



## Reflection:

In the above assignment, I have learned how to repeat the actions by “looping” them until the person has reached the destination.

# Problem #2:

## Problem Statement:




Perform the actions in a way that the person can follow the yellow path to reach the destination.

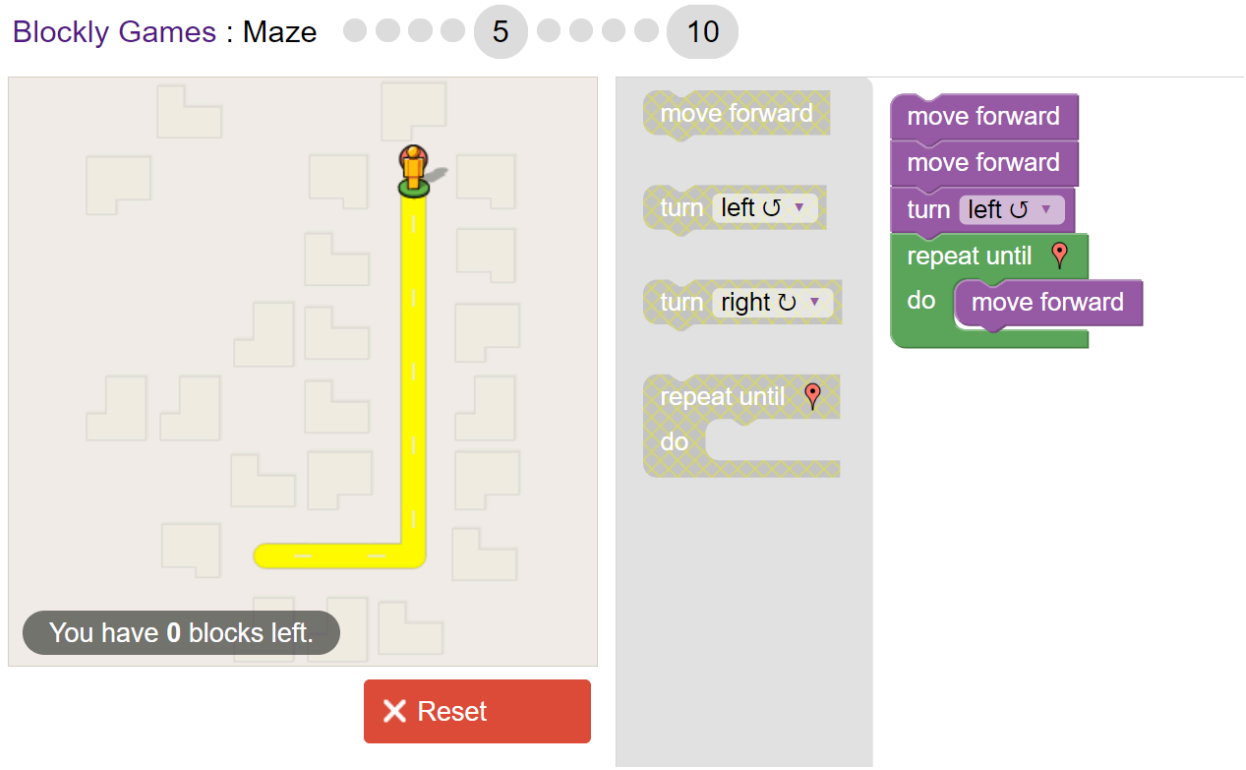
## Plan:

- Determine the path to follow. In this case, we need to follow the yellow path to reach the destination.
- Figure out the steps required to execute in order to follow the path and reach the destination. Here we need to take two steps forward, then take a left and move until we reach the destination.
- If the person is stuck or wrong action has been executed, then retrace the steps and the actions executed where the wrong action has been executed.
- Modify those steps and the following actions where the person has taken a wrong action.
- Repeat the steps until the person reaches the destination.

## Algorithm:

1. Take a step forward.
2. Take another step forward
3. Take a left turn.
4. Repeat the following steps until the person reaches the destination.
    a. Take a step forward.

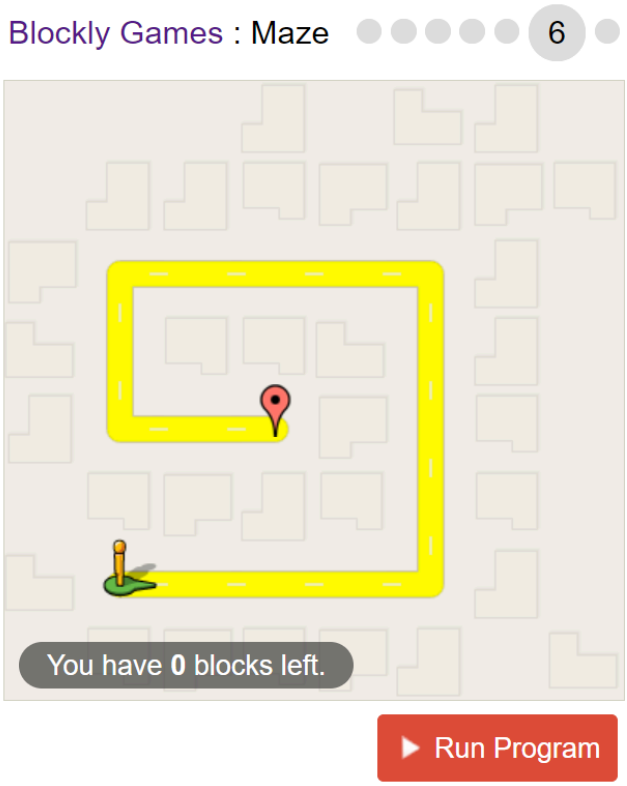
## Screenshot:




## Reflection:

In this problem, I have executed the steps before performing a “looping action” because I need to take the left turn only once and before that, I need to move two steps forward. So the first three steps should be performed outside the loop and execute the “move forward” step after taking the step in a looping manner until I have reached the destination.

# Problem #3:




Perform the actions in a way that the person can follow the yellow path and reach the destination.

## Plan:

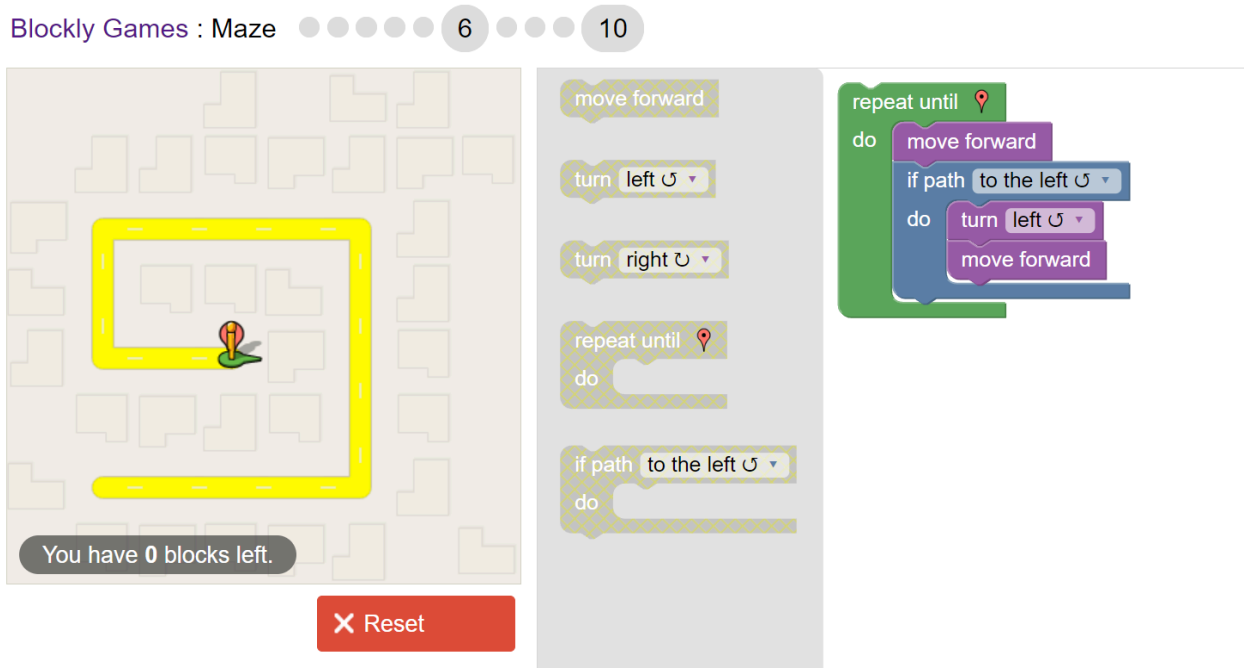
- Determine the path. In this case, there is only one path which is the yellow path.
- Figure out the steps required inorder to follow the path and reach the destination. In this case, we need to take some n steps forward, take a left turn, move another few steps forward, take another left turn and so on until we reach the destination.
- If the person is stuck or wrong action has been executed, then retrace the steps and the actions executed where the wrong action has been executed.
- Modify those steps and the following actions where the person has taken a wrong action.
- Repeat the 3 and 4 steps until the person reaches the destination.

## Algorithm:

1. Repeat and perform the steps until the person reaches the destination:
    a. Move forward.
    b. If there is a left turn then:

i. Take a left turn
ii. Move forward.

## Screenshot:

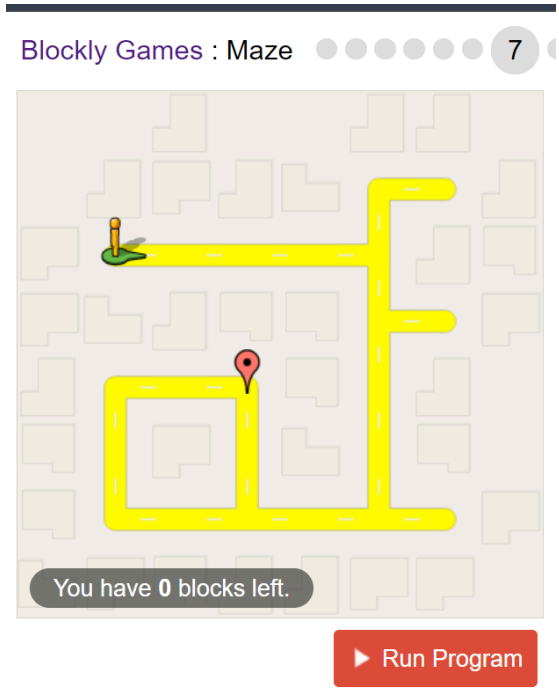



## Reflection:

Here I have learned how we can execute a few set of actions only if a certain condition is satisfied and running this condition in a loop makes the algorithm check this condition and perform these set of actions everytime it gets satisfied.

# Problem #4:

## Problem Statement:




In this following problem, perform the actions in a way that the person can only follow the right yellow path and reach the destination.

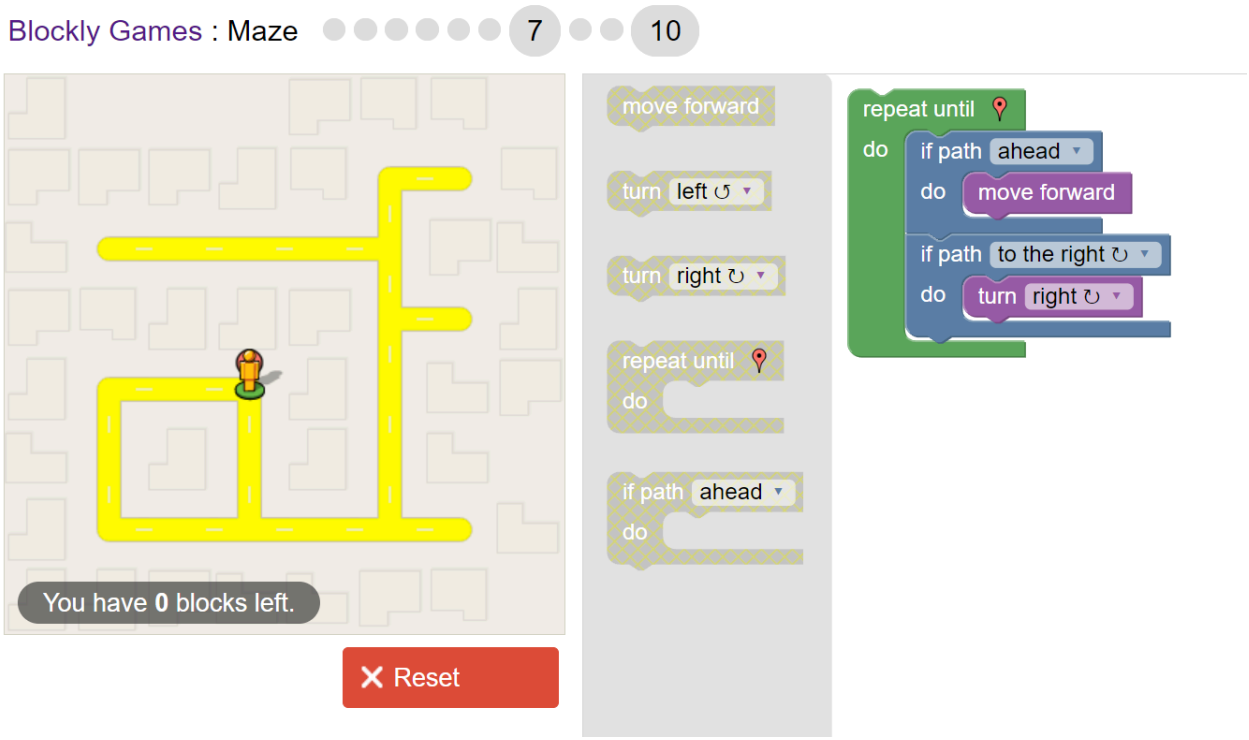
## Plan:

- Determine the path. In this case we need to follow the yellow path and only take the right turns, so that it can reach the destination.
- Figure out the steps. In this case we need to take a few steps forward. If there is a right turn then take the right turn and move forward.
- If the person is stuck or wrong action has been executed, then retrace the steps and the actions executed where the wrong action has been executed.
- Modify those steps and the following actions where the person has taken a wrong action.
- Repeat the 3 and 4 steps until the person reaches the destination.

## Algorithm:

- Repeat and perform the steps until the person reaches the destination:
    - If there is a path ahead then move forward
    - If there is a right turn then turn right.

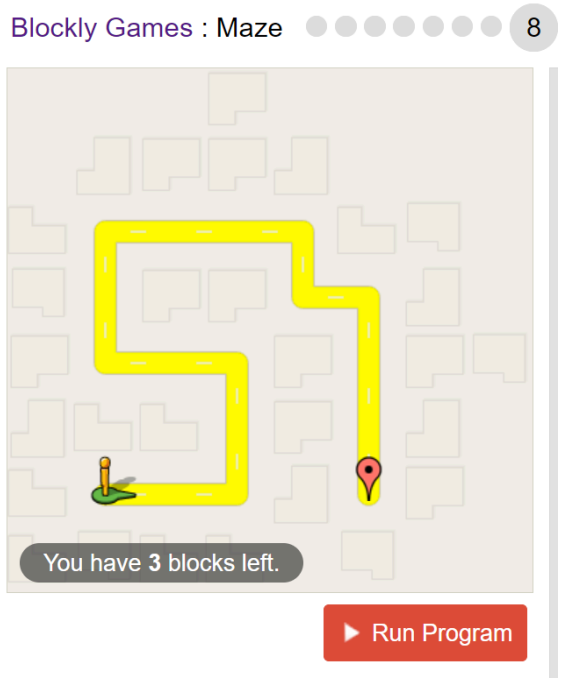
## Screenshot:




## Reflection:

In this problem statement, I have learned how to execute multiple statements that will only gets executed if and only if the condition is satisfied.

# Problem #5:




Perform the actions in a way that the person can follow the yellow path and reach the destination.

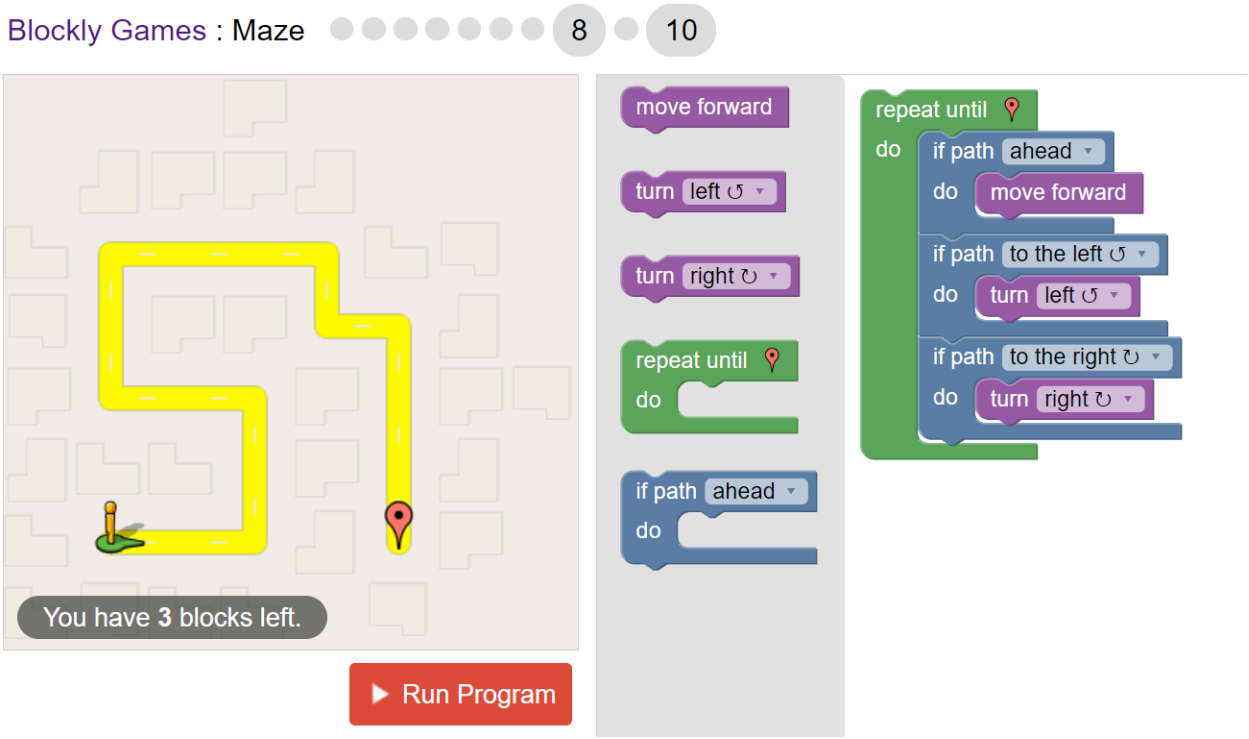
## Plan:

- Determine the path. In this case there is only one yellow path.
- Figure out the steps required to follow the path to reach the destination. In this case take few steps forward. If there is a left turn then take the left turn and if there is a right turn then take the right turn.
- If the person is stuck or wrong action has been executed, then retrace the steps and the actions executed where the wrong action has been executed.
- Modify those steps and the following actions where the person has taken a wrong action.
- Repeat the 3 and 4 steps until the person reaches the destination.

## Algorithm:

- Repeat and perform the following actions until the person reaches the destination.
    - If there is a path forward then move forward.
    - If there is a left turn then take a left turn.
    - If there is a right turn then take a right turn.

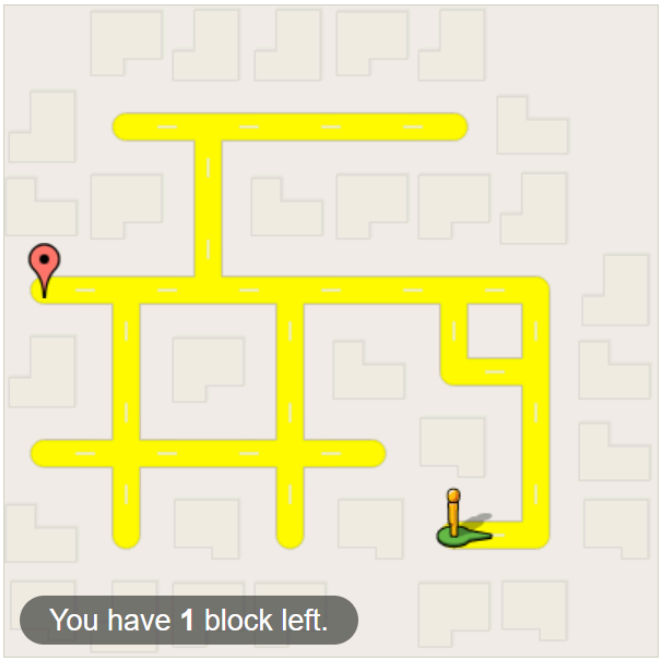
## Screenshot:




## Reflection:

Similar to the previous problem statement, we have executed multiple conditional actions which will be executed if and only if the condition is satisfied. So we first check if there is a path ahead first and then if there is a left turn and finally the right turn. So these conditional actions are checked in the sequential order and then they get executed if the condition gets satisfied.

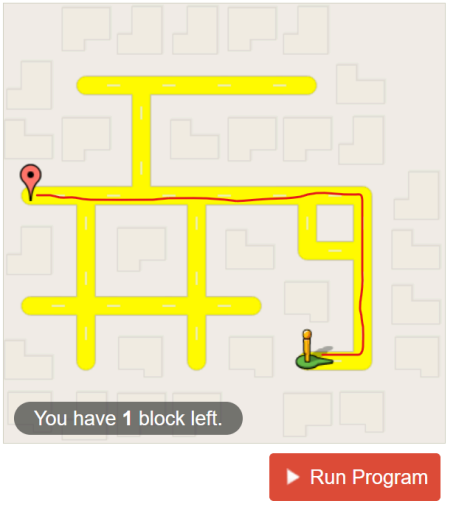
# Problem #6:




In this following problem, perform the actions in a way that the person can only follow the right yellow path and reach the destination.

## Plan:

- Determine the path



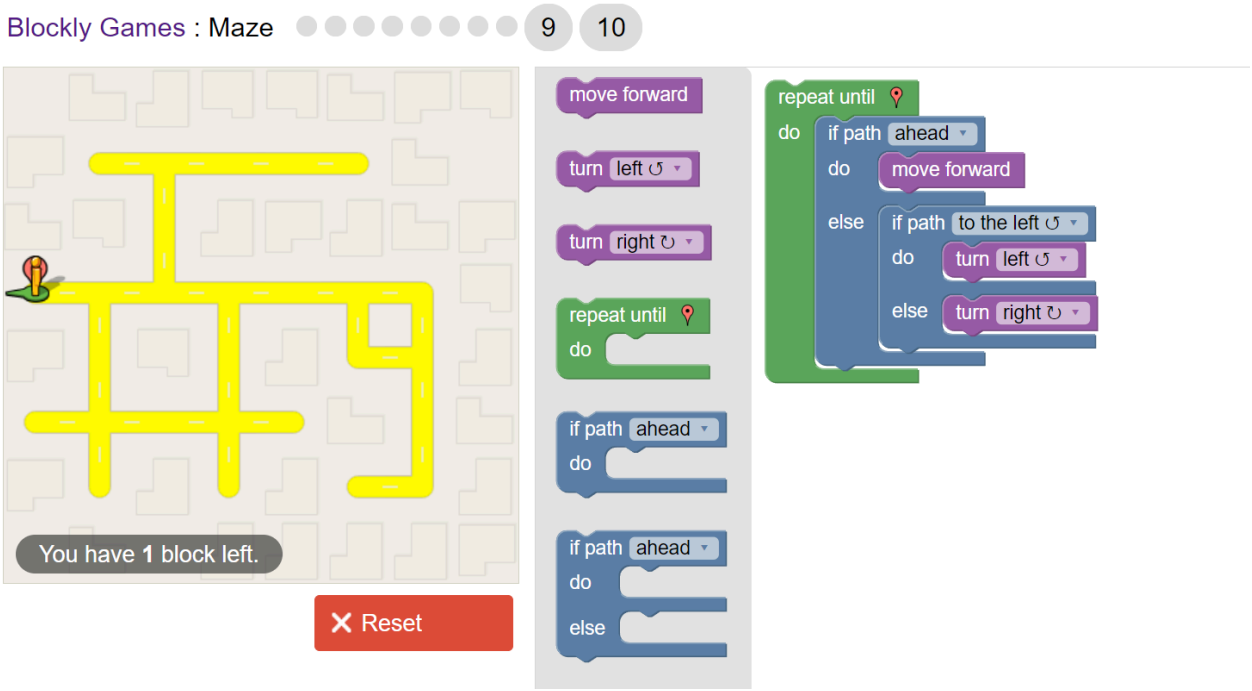

Here we can follow the red line over the yellow path to reach the destination.

- Figure out the steps required to follow the path to reach the destination. In the above path, we only need to take the left turn only if there is a corner.
- If the person is stuck or wrong action has been executed, then retrace the steps and the actions executed where the wrong action has been executed.
- Modify those steps and the following actions where the person has taken a wrong action.
- Repeat the 3 and 4 steps until the person reaches the destination.

## Algorithm:

- Repeat and perform the following actions until the person reaches the destination.
    - If there is a path ahead then move forward:
    - If there is no path ahead then check:
        - If there is a left turn then take a left turn
        - Otherwise take a right turn.

## Screenshot:

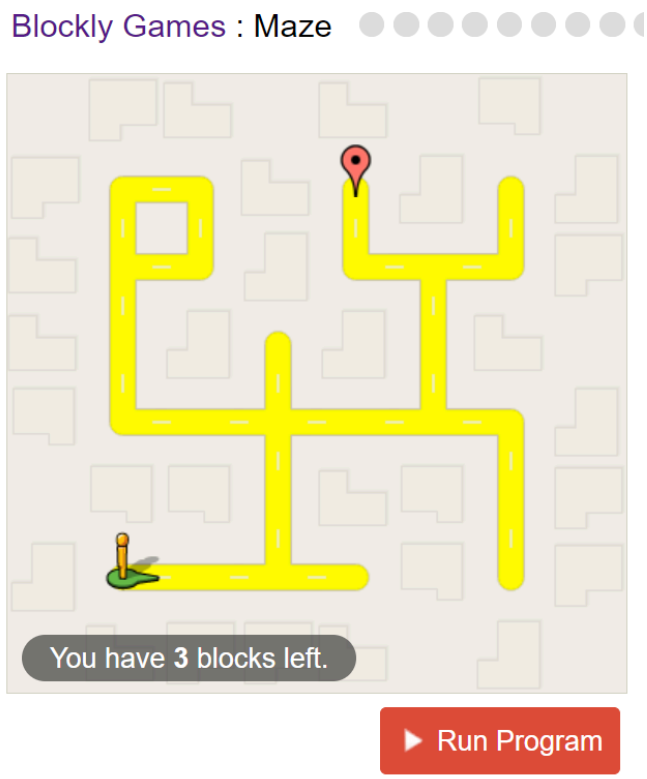



## Reflection:

In this problem statement, I have learned how to implement conditional actions one inside the other in a nested manner.

# Problem #7:

## Problem Statement:




In this following problem, perform the actions in a way that the person can only follow the right yellow path and reach the destination.

## Plan:

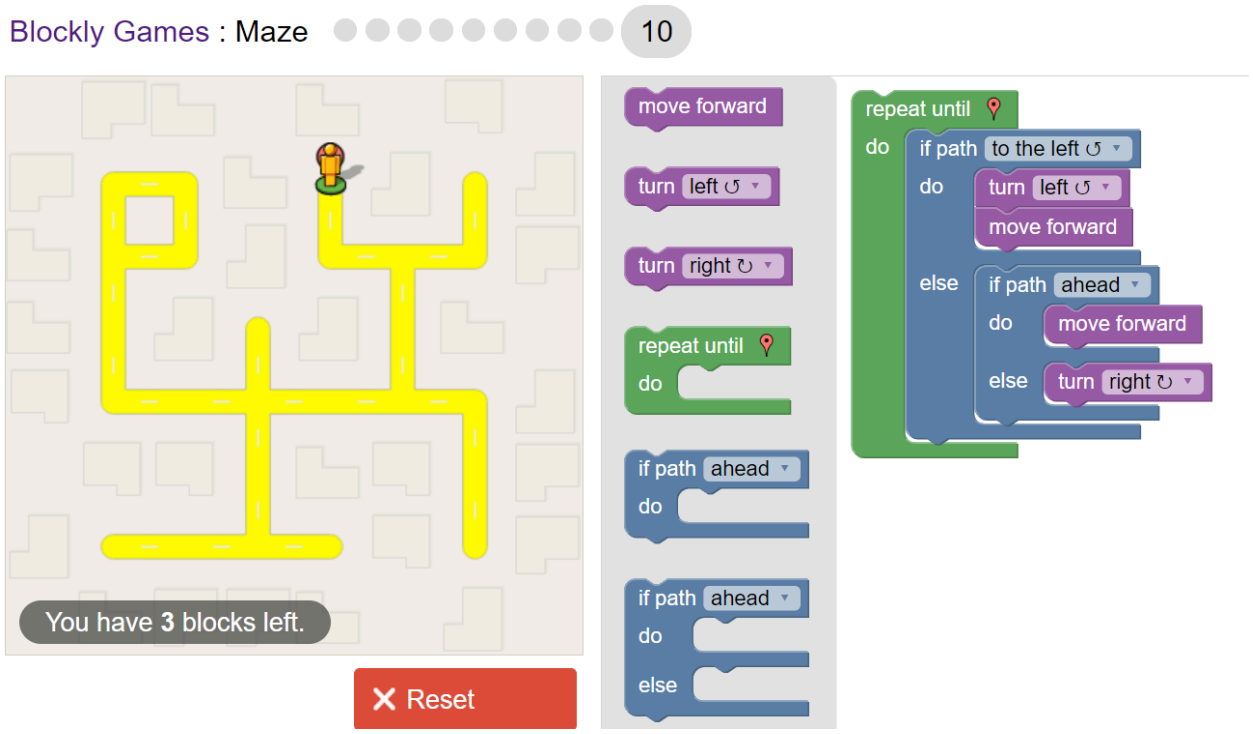
- Determine the Path. In this case we can try moving forward and then taking left turn but if we encounter a dead end we try to move back.
- Figure out the steps required to follow the path to reach the destination
- If the person is stuck or wrong action has been executed, then retrace the steps and the actions executed where the wrong action has been executed.
- Modify those steps and the following actions where the person has taken a wrong action.
- Repeat the 3 and 4 steps until the person reaches the destination.

## Algorithm:

- Repeat and Perform the following steps until the person reaches the destination:
    - If there is a left turn then:

        - Take a left turn
        - Move forward.
    - Otherwise:
        - If there is a path ahead then take a step forward.
        - Otherwise turn right.

## Screenshot:




## Reflection:

Similar to the previous question, I have learned how I can apply branched conditional actions in a nested manner so I can move the person from the start to the destination.