

Lecture 6 Exercise:

Snakes and Ladders – Requirements Analysis and Flowchart Construction

In this activity, you will analyse a problem, identify the required features of a computing solution, and reconstruct a flowchart from a set of provided elements.

Scenario

You have been given a collection of randomly arranged flowchart pieces. These pieces form the logic for a computer program that plays a game of Snakes and Ladders between a human player and the computer.

Your task is to study the problem description below and then organise the flowchart elements into the correct order to form a complete solution.

Problem Description

Design a program that allows a human player to play a full game of Snakes and Ladders against the computer.

The program must meet the following requirements:

1. Token Selection

- The player must be able to choose a token colour (Red or White).
- The computer automatically uses the remaining colour.

2. Turn Order

- The program must randomly select who goes first.

3. Dice Rolling

- The player rolls the dice manually (e.g., by clicking a button).
- The computer rolls the dice automatically on its turn.

4. Movement

- After each roll, the current player's position must be updated.

5. Snakes and Ladders Rules

- If a player lands on the bottom of a ladder, they must climb to the top.

- If a player lands on the head of a snake, they must slide to the tail.

6. Win Condition

- The first player to reach **position 100 or higher** wins the game.

7. Output and Feedback

- The program must show:
 - The current position of each token
 - Each dice roll
 - Messages such as **“Player Wins”**, **“Computer Wins”**, and **“Game Over”**

8. Play Again Option

- When the game ends, the user must be asked whether they want to play again.
- If they choose **Yes**, the game restarts from the beginning.

Your Tasks

Task 1 – Requirements Understanding

Read the problem description carefully. Make your own short notes identifying inputs, outputs, decisions, and processes.

Task 2 – Flowchart Reconstruction

Using the **flowchart elements provided**, arrange them into a correct and logical order so that the finished flowchart solves the problem described above.

Task 3 – Checking Your Solution

When your flowchart is complete, check that it:

- Contains all essential steps
- Follows the rules of the game
- Includes decisions and loops correctly
- Ends only when a player wins or when the user chooses not to replay