

**CSE201 Advanced Programming**  
**Lab Assignment 03**  
**22 October 2021**  
**Due Date 11:59 PM 26 October 2021**

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**IMPORTANT INSTRUCTIONS**

This assignment is a take-home lab assignment. No extensions whatsoever will be provided. Any submission after the deadline will not be evaluated. If there is any ambiguity or inconsistency in a question, please seek clarification from the teaching staff. Please read the entire text below very carefully before starting its implementation.

**Plagiarism: All submitted lab assignments are expected to be the result of your individual effort. Any plagiarism case is detected, it will be dealt with as per IIITD plagiarism policy and without any relaxations:**

<https://www.iiitd.ac.in/sites/default/files/docs/education/AcademicDishonesty.pdf> Please note that you are not allowed to discuss the lab assignment's design/solution (e.g. classroom page discussions, etc.). Anyone who is found doing this will be treated as a plagiarism case. No excuses!

**NOTE:** We won't respond to any query because you missed the read the description carefully. We will ONLY respond to valid questions. Make sure you ask all your doubts in advance and not at the last minute.



**Vivek Kumar**  
6:48 AM



Students, I am seeing most of the doubts being asked for assignments are unnecessary, and you can quickly resolve them on your own to avoid confusion and save your time. Some examples: a) what if XYZ happens but it is not mentioned in the test case, b) can we use the XYZ approach, c) how to take input, etc. Now that you have completed your assignment-1 demo, it should be clear that we evaluate assignments to check: a) if your implementation is working with the test case provided in the assignment documentation, and b) the OOP concepts mentioned in a particular assignment has been used properly or not. As long as you fulfil these two criteria, its totally up to you if you want to spend more time to implement any extra functionality in your solution that is not mentioned in the assignment document. I hope this helps.



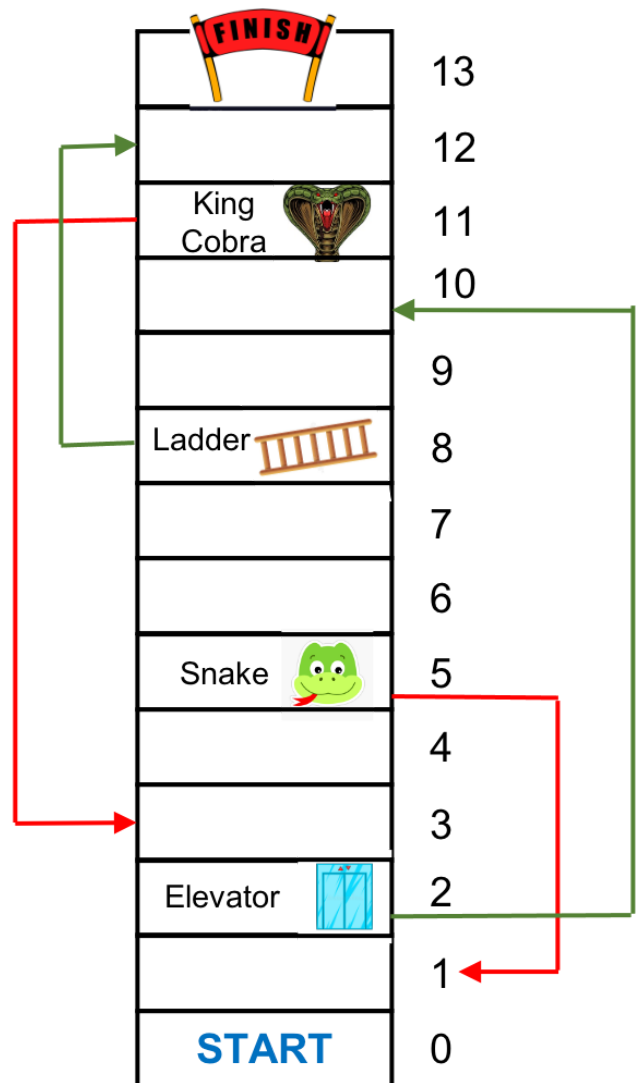
1 class comment



**Vivek Kumar** 8:06 AM

I thought this is obvious from Lecture 02, but let me give an alternative explanation. For example, when you get a new assignment, first see which all OOP concepts has been told to use in this assignment documents. Lets say its interfaces and polymorphism, then the first thing you should do is to take a pen and paper and identify a) classes, attributes, and methods, b) class relationships, and c) interfaces and their methods. Now think where do you see polymorphism can be used. Write this as well on the paper. Now code this basic design that you currently have on paper. NOW it is the time when you should see the test case and complete the rest of the implementation such that it fulfils the scenario mentioned in the test case. Remember from Lecture#02, Slide#4: "Novice programmers often think that writing code is the heart of software development, but actually it should be the least creative step"

## SNAKES AND LADDERS



**Pictorial Representation of how you can play snakes and ladders**

## Assignment Description

Although we are providing a simple test case, it is really simple to play this game. The rules of the game are exactly as shown in the above picture.

You **must** use the following OOP concepts in this assignment to obtain marks: a) classes and objects, b) class relationships, c) **inheritance**, and d) **polymorphism**. **Interfaces should NOT be used**.

### **1. Player**

This is a single player game with a really simple objective: how many game points the player obtained when he completed the game. The player has a name and s/he must remember his position on the game floor after every move.

### **2. Game**

As shown in the picture, the game would have 14 floors and it counts the total points collected during the game play. Negative points are also allowed in the game. There are different types of floors: a) empty floor, b) snake floor, and c) ladder floor. There are two types of snake floor that you can ever encounter: a) normal and b) king cobra. Likewise, there are two types of ladders that you can ever encounter: a) normal, and b) elevator. The location of each snake floor, ladder floor, and empty floor is fixed as shown in the picture. Each floor must remember its location in the game.

Whenever a player moves to any floor, s/he has to jump on the floor to know the type of floor:

- Empty floor rewards the player with one point and displays the message that player has reached an empty floor.
- Normal snake floor would deduct two points from total and would display the message that player has reached normal snake floor. After this it will move the player's position to the first floor as shown in the picture.
- King cobra snake would deduct four points from total and would display the message that player has reached king cobra. After this it will move the player's position to the third floor as shown in the picture.
- Ladder floor rewards the player with two points and displays the message that the player has reached a ladder floor. After this it will move the player's position to the twelfth floor as shown in the picture.
- Elevator floor rewards the player with four points and displays the message that the player has reached the elevator floor. After this it will move the player's position to the tenth floor as shown in the picture.

### **3. Dice**

This game has a special dice that has only two faces, 1 and 2. When a dice is thrown, it returns a randomly chosen face value. To make this assignment even more simpler, **you can reuse** the Dice class from Lecture 01.

The game is started **only** when the player gets 1 on the Dice.

**Sample test case:**

**Enter the player name and hit enter**

**Michael Jackson**

The game setup is ready

**Hit enter to roll the dice**

Dice gave 2

Game cannot start until you get 1

**Hit enter to roll the dice**

Dice gave 1

Player position Floor-0

Michael Jackson has reached an Empty Floor

Total points 1

**Hit enter to roll the dice**

Dice gave 2

Player position Floor-2

Michael Jackson has reached an Elevator Floor

Total points 5

Player position Floor-10

Michael Jackson has reached an Empty Floor

Total points 6

**Hit enter to roll the dice**

Dice gave 2

Player position Floor-12

Michael Jackson has reached an Empty Floor

Total points 7

**Hit enter to roll the dice**

Dice gave 2

Player cannot move

**Hit enter to roll the dice**

Dice gave 1

Player position Floor-13

Michael Jackson has reached an Empty Floor

Total points 8

Game over

Michael Jackson accumulated 8 points

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**We have kept assignment-3 relatively straightforward and have given a more extended deadline due to your ongoing deadlines and upcoming midsem. However, those interested in adding more exciting functionalities in their submission would be eligible for bonus marks. However, there will be only one bonus mark for any number of additional exciting features you would be implementing. We will announce the exact amount of the bonus later**