COURSE **SUB CODE**	ADVANCE JAVA PROGRAMMING 13CS30E
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PROBLEM TITLE	IMPLEMENTATION OF SNAKE AND LADDER PROBLEM USING HASHMAP

Problem Statement:

The snake and ladders game will be played on a 10x10 board, representing 100 positions, numbered from 1 to 100. The board will have M snakes and L ladders, where M and L are given as input.

Rules of the game:
1. The player starts at position 1 (the starting position).
2. The player rolls a six-sided dice to determine the movement.
3. If the movement takes the player to a position with the head of a snake, they slide down to the tail's position.
4. If the movement takes the player to a position with the bottom of a ladder, they climb up to the ladder's top position.
5. The game continues until the player reaches position 100.

Input:
- M (Number of Snakes)
- L (Number of Ladders)

Output:
- Display the board after each player's turn, showing their current position.
- Announce the winner once the player reaches position 100.

Program:

```
import java.util.*;

public class Main {
   private static int board = 100;
   private static Map<Integer, Integer>snakes = new HashMap<>();
   private static Map<Integer, Integer>ladders = new HashMap<>();

   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
      int numsnakes,numladders,currp=1;
      System.out.print("Enter the number of snakes: ");
```

```
    numsnakes = s.nextInt();
    initializesnakes(numsnakes);
    System.out.print("Enter the number of ladders: ");
    numladders = s.nextInt();
    initializeladders(numladders);
    while (currp < board) {
        System.out.print("Press Enter to roll the dice.");
        s.nextLine();
        int diceRoll = rollDice();
        System.out.println("You rolled a " + diceRoll + ".");
        int newp = currp + diceRoll;
        newp = applydice(newp);
        if (newp <= board) {
            currp = newp;
        }

        displayBoard(currp);
    }
    System.out.println("Congratulations! You reached position 100 You win!");
}

private static void initializesnakes(int n) {
    for (int i = 1;i<=n; i++) {
        Scanner s1 = new Scanner(System.in);
        System.out.print("Enter the head position of snake "+i+": ");
        int head = s1.nextInt();
        System.out.print("Enter the tail position of snake "+i+": ");
        int tail = s1.nextInt();
        snakes.put(head, tail);
    }
}

private static void initializeladders(int n) {
    Scanner s2 = new Scanner(System.in);
    for (int i=1;i<=n;i++) {
        System.out.print("Enter the bottom position of ladder "+i +": ");
        int bottom = s2.nextInt();
        System.out.print("Enter the top position of ladder "+i+": ");
        int top = s2.nextInt();
        ladders.put(bottom, top);
    }
}

private static int rollDice() {
```

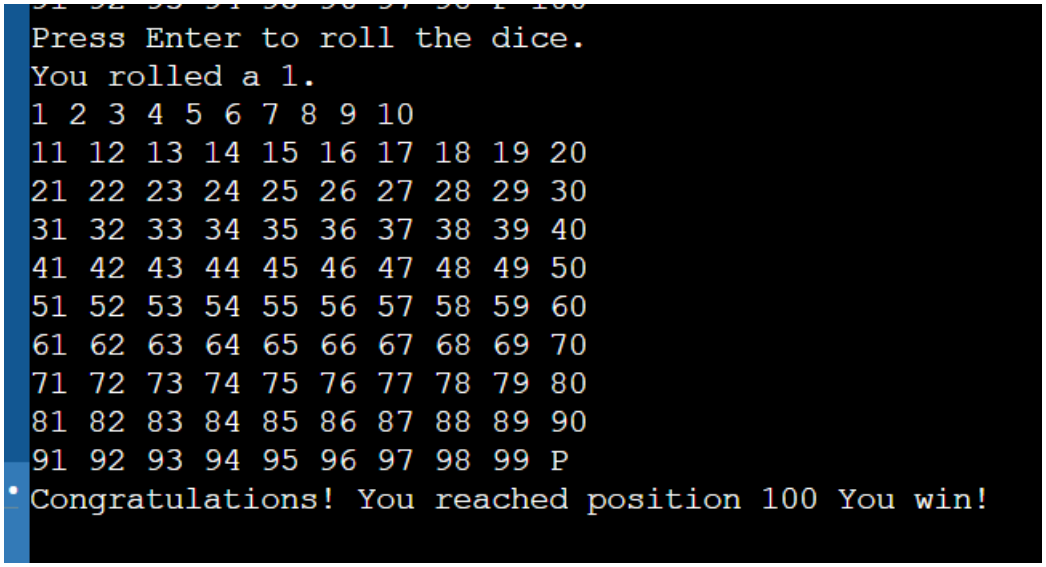
```
        int k= (int)(Math.random()*6)+1;
        return k;
    }

    private static int applydice(int pos) {
        if(snakes.containsKey(pos)) {
            System.out.println("Oops! You landed on a snake.Sliding down to position
"+snakes.get(pos)+".");
            return snakes.get(pos);
        } else if(ladders.containsKey(pos)) {
            System.out.println("Hooray! You landed on a ladder.Climbing up to position
"+ladders.get(pos)+".");
            return ladders.get(pos);
        }
        return pos;
    }

    private static void displayBoard(int currp) {
        for (int i=1;i<=board;i++) {
            if (i==currp) {
                System.out.print("P ");
            }else{
                System.out.print(i+" ");
            }

            if (i%10==0) {
                System.out.println();
            }
        }
    }
}
```

OUTPUT:

```
Enter the number of snakes: 3
Enter the head position of snake 1: 26
Enter the tail position of snake 1: 13
Enter the head position of snake 2: 86
Enter the tail position of snake 2: 6
Enter the head position of snake 3: 98
Enter the tail position of snake 3: 62
Enter the number of ladders: 3
Enter the bottom position of ladder 1: 5
Enter the top position of ladder 1: 15
Enter the bottom position of ladder 2: 19
Enter the top position of ladder 2: 80
Enter the bottom position of ladder 3: 76
Enter the top position of ladder 3: 97
```

```
Press Enter to roll the dice.
You rolled a 5.
Oops! You landed on a snake.Sliding down to position 6.
1 2 3 4 5 P 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100
```

```
Press Enter to roll the dice.
You rolled a 6.
Hooray! You landed on a ladder.Climbing up to position 80.
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 P
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100
```


Press Enter to roll the dice.
You rolled a 1.
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 P
Congratulations! You reached position 100 You win!