

National University of Computer and Emerging Sciences, Lahore Campus



Course:	OOAD	Code:	CS-309
Program:	BS(Computer Science)	Semester:	Fall '19
Duration:	150 minutes	Total Marks:	40
Date:	Friday 18-October-2019	Weight	20
Section:	All Sections	Page(s):	2
Exam:	Lab Mid	Roll No	

Instructions/Notes:

- You must ensure that you have made proper submission of your code and followed submission guidelines. No Issues will be entertained later on.**
- Discussion with other students is not allowed.**
- Use of the internet, notes, codes, lab manuals, and flash drives is strictly prohibited.**
- Plagiarism will result in F grade in lab.**
- No previous code of yours or lab manuals are not allowed.**
- Submit only JAVA files and .png file for class diagram (use snipping tool for it)**
- Submission path**
- \\Cactus\Xeon\Farwa Batool\OOAD MID SUBMISSION\ SECTION X**
 - Here X will be your section [A,B,C,D,E or F]**
- Submit in correct lab folder. Failure to comply with this instruction will result in a penalty.**
- Submission folder should have both JAVA and png file. Name of folder will be your roll number. LXX-XXXX**

You need to develop an application name as “FAST Gaming Arcade System”. This arcade has two types of games “Online Games” and “Offline Games”.

A player can play games in three modes solo mode, single-player mode or multiplayer mode.

- In solo, mode player has no opponent
- In single-player, a player can play vs computer
- In multiplayer, a player can play vs another online player.

Offline games have List of all solo player game modes.

Online games have List all single-player and multiplayer modes.

Each player can be either a privileged player or an ordinary player. Each player has an ID, name, and score. The privileged player is the player that can made many In-app purchases (paid a small amount of money to buy game facilities). Whereas the ordinary player cannot made any In-app purchases. For in-app purchases, a payment (only via credit card) is done and player will buy coins, price of 1 coin is 0.25 RS. Therefore, each in-App purchase have payment details and coins through which player can buy different facilities provided by game.

There is also a leaderboard for each online game, in which the top 10 player’s information is stored. A player can also see the leader board even he/she is not in the leaderboard. Players will ranked on the bases of game criteria.

(Game 1 {Online Single-player and multiplayer}) (Write both versions of it)

Snake and Ladder:

This game has a board of **20 cells**; each cell can have 3 types of objects “Snake”, “ladder” and “empty”. When games start, generate a **20-cell grid** with all empty objects. Then place 2 snakes on 2 random positions of that grid and place 3 ladders on 3 random positions of that grid (snake and ladder positions are different). This game should maintain the turn of each player, for example, if there are two players then the first turn was taken by player one then the second should take by player two and then again player one and so on.

The game has a play function in which you ask each player to press enter to roll the dice, Dice rolling means a random number will generated between 1 to 6. Then just add that random number into a player's score and check the corresponding cell of the grid if it is an “empty” cell then do nothing. In the case of snake, you should do the following calculation

- $R = \text{Generate a random number from 1 to the current score of the player}$
- $\text{current score of player} = \text{current score of player} - R$

In case of a ladder, you do the following calculation

- $R = \text{Generate a random number from 1 to } (20 \text{ (minus) current score of a player})$
- $\text{current score of player} = \text{current score of player} + R$

The player who reached 100 first, will win the game. Display score and number of turns on the screen. Put winner player in leaderboard if he/she wins a game in fewer turns as compared to the other 10 members in leaderboard [if they exist otherwise simply add].

JAMBO: (Game 2 {Offline and solo player})

JAMBO is a solo player game and a player needs to get a maximum score before the end of life.

In this game, a random number is generated from 0 to n. Initially $n=10$, Then it will ask a user to guess the number if the player correctly guessed the number; the player will get 5 points. Now increment the value of n by 1 for the next iteration. Perform the above task again until the user guessed the wrong value. Display the user score properly at the end. Put winner player in leader board if his/her score is greater than the score of already existing members in the leaderboard [Otherwise, simply add].

Play function of solo player will receive only one player

Play function of Single Player game will receive only one players, second player is Computer.

Play function of Multi player game will receive List of 2 players

In-app purchases will allow players to

- Have 1 extra life in case of “JAMBO”, it will cost 10 coins, in case of buying again, cost will doubled and so on.
- Have 1 extra dice roll in each turn in case of “Snake and Ladder”, it cost 100 coins.

Make proper Functions and data members for a smooth flow. Mention your assumptions in comments.

Q1. Identify all the classes and make a clear and compact class diagram with well-defined relations. Marks will be deducted if there is a mismatch between design and implementation. Use StarUML for this part. **(Submit only .png file of UML diagram. Use sniping tool for it.)** **(15 marks)**

Q2. Develop a complete java application for the above-mentioned system. Your program should able to perform all mentioned task but for main, you should do at least following tasks **(Submit only JAVA files)** **(25 marks)**

- Create two ordinary players and they should able to play snake and ladder and then add the winner in the leaderboard. Display the leaderboard.
- Create a privileged player. The player should able to play JAMBO. Also, then display the player score and then add a player in the leaderboard. Display the leaderboard.
- Replicate the given `\\Cactus\Xeon\Farwa Batool\output_of_mid.JAR` file.

```
Random rand = new Random();
int val = rand.nextInt(50);
for 10 to 50 rand.nextInt((50 - 10) + 1) + 10
```