

# National University of Computer and Emerging Sciences, Lahore Campus



<b>Course:</b>	<b>Object Oriented Programming</b>	<b>Course Code:</b>	<b>CS 217</b>
<b>Program:</b>	<b>BS(Computer Science)</b>	<b>Semester:</b>	<b>Spring 2020</b>
<b>Duration:</b>	<b>180 Min + 20 Min for Submission</b>	<b>Total Marks:</b>	<b>75</b>
<b>Paper Date:</b>	<b>9-Jul-2020</b>	<b>Page(s):</b>	<b>3</b>
<b>Section:</b>	<b>ALL</b>	<b>Section:</b>	
<b>Exam:</b>	<b>Final</b>	<b>Roll No:</b>	

**Submission Instruction/:** Submit your system design image and implementation file (.cpp) one zip file named with your Roll Number as **19-1234.zip**

## Question: (75 marks)

Consider a Gaming Zone, where players can play various games on different platforms e.g. PCs, PlayStations (PS) and Xboxes. The games played on PlayStations (PS) and Xboxes are single player and multiplayer. However, PC gaming is only done in teams of three to five players.

You have to design a simple application for Gaming Zone with two gaming platforms i.e. PlayStation and PC. It should keep track of all the players and platforms available in gaming zone. It will also manage allocation of different gaming platforms to the gamers. A PC can be assigned to only one player at a time. However, a PlayStation can be assigned to more than one player at a time, because every PS has different number of controllers (2 to 4), and each controller of a PS can be assigned to only one player at a time.

- 1) Load Players Data:** Load data of Players from "Players.txt" in players list, which should be dynamic. **(3 marks)**
- 2) Load Platforms Data:** Load data of all platforms from "Platforms.txt", in single platforms list, which should be dynamic. In this file, first 20 entries represents PC's data and next 10 entries are for Play stations with different number of controllers. **(3 marks)**
- 3) Print All Players (2 marks)**
- 4) Print All Platforms (2 marks)**
- 5) Sign Up:** When a new player arrives and wants to play, he must first sign up with some basic details (first name, last name, contact number and initial balance loaded in the player's account, e.g. 100 to 500 PKR). System will assign a unique id to every player on Sign Up. A player, who already has an account, will input the login id and he can head towards the platform selection. **(3 marks)**
- 6) Play on PS:** System will assign a free PS controller from the list of platforms to the player and will start the game. The controller allocated can be of a completely free PS or a PS which is already being played by some other player(s). If the balance in players account is above a certain threshold (say Rs. 30), then he can start playing. Otherwise, the system will prompt the player, that he does not have enough balance in his account, and will ask him to load some amount in his account first. After loading balance, a player can play the game. All the games played on a PS will include a single player, but more than one players can use same PS at a time depending upon number of available controllers. **(3 marks)**
- 7) Play on PC:** The games on PC can be played in-group of three to five (3 to 5) players only. At first, system will check the availability of PC's, from the list of platforms, for all players of that group. If PC's are available for all players of the group, then system will assign PC's to players and then players can play the game. Otherwise, the system will refuse to start the game. **(3 marks)**

**Note:** Whenever a PC is assigned to a player or all controllers of a PS have been assigned to some players, then the status of that PC or PS is changed and they are made unavailable for other users. When a game ends, all assigned platforms' status will be updated and they will be made available for users again.

- A) Write a global template function to double the size of any array. You must use this function to extend the array sizes in Gaming zone application. (5 marks)**
- B) Design a UML diagram of the system with all classes and relationships among them on a paper. You will submit the snapshot of the design. (10 marks)**
- C) Implement the complete working application of Gaming zone with all required functionalities. You will add all definition and implementation of all classes in single file (FE.cpp) (39 + 2 marks for comments)**

Following are snapshots of working application.

### Sign Up

```
What do you want to do?
  1. Register new player
  2. Login
  3. Press Any key to Exit

Enter your choice: 1

Enter new player's first name: Abeeda

Enter new player's last name: Akram

Enter player's contact number: 4534545

Enter initial balance: 33
Your Details are: Player ID: 16
Name: Abeeda Akram
Contact: 4534545
Balance: 33
Press any key to continue . . .
```

### Play a PS Game

```
What do you want to do?
  1. Register new player
  2. Login
  3. Press Any key to Exit

Enter your choice: 2
Enter Your User Id: 3
What do you want to do?
  1. Play a PS game
  2. Play a PC game
  3. Press Any key to Exit

Enter your choice: 1
Platform id: 3333
Availability: 1
Controllers: 2
PS 3333 is currently Assigned to:
Player ID: 3
Name: Irfan Majeed
Contact: 345678912
Balance: 155

* Starting PS Game *
Press any key to continue . . .
```

```
What do you want to do?
  1. Register new player
  2. Login
  3. Press Any key to Exit

Enter your choice: 2
Enter Your User Id: 2
What do you want to do?
  1. Play a PS game
  2. Play a PC game
  3. Press Any key to Exit

Enter your choice: 1
Platform id: 3333
Availability: 1
Controllers: 2
PS 3333 is currently Assigned to:
Player ID: 2
Name: Fakhar Imam
Contact: 234567891
Balance: 20

Not Enough Balance to Start PS Game!
Press any key to continue . . .
Enter the amount to load in Fakhar Imam's account: 58
* Starting PS Game *
Press any key to continue . . .
```

**Play a PC Game**

```
What do you want to do?
  1. Register new player
  2. Login
  3. Press Any key to Exit

Enter your choice: 2
Enter Your User Id:3
What do you want to do?
  1. Play a PS game
  2. Play a PC game
  3. Press Any key to Exit

Enter your choice: 2

Enter the number of players in a team (3 to 5): 3
Enter id of Player #2
9
Enter id of Player #3
8
Platform id: 1234
Availability: 0
PC 1234 is currently Assigned to: Player ID: 3
Name: Irfan Majeed
Contact: 345678912
Balance: 155
* Starting PC Game *
Platform id: 2345
Availability: 0
PC 2345 is currently Assigned to: Player ID: 9
Name: Zubair Anwar
Contact: 912345678
Balance: 355
* Starting PC Game *
Platform id: 4567
Availability: 0
PC 4567 is currently Assigned to: Player ID: 8
Name: Ayesha Farooq
Contact: 891234567
Balance: 434
* Starting PC Game *
Press any key to continue . . .
```