**PSP**

**Week 10, Assessed exercises**

1. **Dice Game**

We are going to create a game with dice using classes. In this session we will develop the game in steps.

1. **Die Class**

Dice are using in many games. One die can be rolled to randomly show a value from 1 to 6. We are going to create a class Die that simulate a die rolling.

Design and implement a class **Die** that simulates a die.

The value of the **die** needs to be stored in a field and you will need to create a **constructor** for the class that initialises the value of the **die to 1**.

Add a method **rollDie** to roll the die (from 1 to 6). Note that you will need to call the **randint** method inside the random class library to roll the die.

Add a method **getDie** returns the value of the die.

1. **Player Class**

Now you have to implement a class **Player** where you store the **name** of the player, the **score** of the player and the **sum** of the player. You have to implement a **constructor** for the class with the name of the player as a parameter. The constructor will receive the **name** and initialise the **score and sum to 0**.

Add a method **updateScore** that updates the score of the player. The method receives a number **points** as a parameter and set **score** to this **points**.

Add a method **sumAllScore** to **sum** all the score of the player.

Add a method **getName** to returns the value of the **name**.

Add a method **getUpdateScore** to returns the value of the current **score**.

Add a method **getSum** to returns the value of the **sum**.

1. **Initial game**

Create a program that has two players and two dice. A player then throws the two dice, gets the value for each dice and the sum of the two values are added to his/her score. Then the other player will throw the dice. Then exchange the turn.

If any player throws **double 4**, his/her score of the current turn will be **set to -5**.

If any player throws **same value (not double 4)**, he/she can gain **double score** of the current turn.

Any player gain **more than 50** will end game after two players finish their turn.

At the end, the player with the highest score wins and the names of the two players and their score are displayed.

Please use function **gameOver(player1, player2), castDice(dice1, dice2), displayWinner(player1, player2)**.

Complete the implementation and testing. Your program should have necessary comments for loops and selections, and also should write some necessary documentation strings for functions and classes.

Do not access the attributes of the class directly, use getter methods instead. (Hint: getter methods - getDie, getName, getUpdateScore, getSum…)

Your program should follow the test case with same input and output.

