

**King Saud University**  
**College of Computer & Information Science**  
**CSC111 – Lab06**  
**Loops**  
**All Sections**

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## **Instructions**

Web-CAT submission URL:

<http://10.131.240.28:8080/Web-CAT/WebObjects/Web-CAT.woa/wa/assignments/eclipse>

## **Objectives:**

Student should learn how to:

- 1- Follow the loop design strategy to develop loops.
- 2- Control a loop with a sentinel value.
- 3- Write loops using for statements
- 4- Write nested loops
- 5- Combine loops and control statements to solve problems with complex logic

## Lab Exercise 1

Write a Java program that calculates and prints the cost of games that a customer buys at a gaming store as following:

- The cost of the game is input.
- A customer must buy at least 1 game (otherwise print "Error").
- If a customer buys more than 2 games then he will get a 20% discount.

Your program should read game id, the cost of the game as a double value and number of games. Then it should print the total cost after discount (if applicable). Name your class **GameStore1**.

Here are some sample runs to show different cases:

### Sample Run 1

```
Welcome to Gaming Center :).  
Please, enter game id: 1 ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of games: 5 ↵  
Total price for game 1 is: 400.0SR
```

### Sample Run 2

```
Welcome to Gaming Center :).  
Please, enter game id: 3 ↵  
Please, enter the price of a game: 200 ↵  
Please, enter number of games: 2 ↵  
Total price for game 3 is: 400.0SR
```

## Sample Run 3

```
Welcome to Gaming Center :).
Please, enter game id: 6 ↵
Please, enter the price of a game: 200 ↵
Please, enter number of games: 0 ↵
Error
```

### Solution

- 1- Create a new eclipse project and name it **lab06**
- 2- Create a new class and name it **GameStore1**. Make sure you choose the `public static void main` option.
- 3- Write the program as shown in next page (you can ignore comments)
- 4- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 5- Submit your program to WebCAT through. Ask your TA for help.

```

import java.util.Scanner;
public class GameStore1 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("Welcome to Gaming Center :).");
        System.out.print("Please, enter game id: ");
        int id = input.nextInt();
        System.out.print("Please, enter the price of a game: ");
        double price = input.nextDouble();
        System.out.print("Please, enter number of games: ");
        int num = input.nextInt();
        if (num < 1)
            System.out.println("Error");
        else {
            double totalPrice;
            //if more than two copies then use discount
            if (num > 2 ){
                double discount = 20.0 / 100;
                double totalPriceBeforeDiscount = price * num;
                totalPrice = totalPriceBeforeDiscount * (1 - discount);
            }
            else
                totalPrice = price * num;
            System.out.println("Total price for game "+ id +
                " is: " + totalPrice + "SR");
        }
    }
}

```

## Lab Exercise 2

Previous program has a problem since it does not allow you to enter different prices for different games. Convert your program into an interactive point of sale program for a gaming store. The new program should work as following:

- The program will read id, price of games until user enters -1 as a game id.
- If a customer buys more than 2 copies then he will get a 20% discount otherwise he will pay regular price.
- The program should print price before discount, discount amount and price after discount.

Name your class **GameStore2**.

Here are some sample runs to show different cases:

### Sample Run 1

```
Welcome to Gaming Center :).  
Please, enter game id: 1 ↵  
Please, enter the price of next game: 100 ↵  
Please, enter game id: 2 ↵  
Please, enter the price of next game: 130 ↵  
Please, enter game id: 4 ↵  
Please, enter the price of next game: 200 ↵  
Please, enter game id: -1 ↵  
Total price before discount: 430.0SR  
Your discount is: 86.0SR  
Total price after discount: 344.0SR
```

## Sample Run 2

```
Welcome to Gaming Center :).
Please, enter game id: 1 ↵
Please, enter the price of next game: 100 ↵
Please, enter game id: 2 ↵
Please, enter the price of next game: 200 ↵
Please, enter game id: -1 ↵
Total price before discount: 300.0SR
Your discount is: 0.0SR
Total price after discount: 300.0SR
```

### Solution

- 1- Use the same project **lab06** that you created before
- 2- Create a new class and name it **GameStore2**. Make sure you choose the `public static void main` option.
- 3- Write the program as shown in next page (you can ignore comments).
- 4- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 5- Submit your program to WebCAT through. Ask your TA for help.

```
import java.util.Scanner;
public class GameStore2 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        System.out.println("Welcome to Gaming Center :).");
        System.out.print("Please, enter game id: ");
        int id = s.nextInt();
        double totalPrice = 0;
        int num = 0;
        while (id != -1){
            System.out.print("Please, enter the price of next game: ");
            double price = s.nextDouble();
            totalPrice += price;
            num++;

            System.out.print("Please, enter game id: ");
            id = s.nextInt();
        }
        double discount = 0;
        //if more than two copies then use discount
        if (num > 2 ){
            discount = 20.0 / 100;
        }
        System.out.println("Total price before discount: " +
            totalPrice + "SR");
        System.out.println("Your discount is: " +
            (totalPrice - (totalPrice * (1 - discount))) + "SR");
        totalPrice *= (1 - discount);
        System.out.println("Total price after discount: " +
            totalPrice + "SR");
    }
}
```

### Lab Exercise 3

We are going to change the previous program to add even more interactivity and logic to it. The new program should present user with an options menu that has two options, to add or sell games as shown below:

```
*****
*                               Welcome to Gaming Center :)          *
*                               -----                              *
*   Please enter one of the following options:                       *
*   1) add ==> this allows you to add a game to inventory          *
*   2) sell ==> this allows you to sell games to a customer        *
*   3) exit ==> to end this program                                *
*                                                                     *
*****
```

- If user choose **add** then he will be able to add new games to inventory. When adding a game, the user needs to provide the game id only. Adding ends when id entered is -1.
- If user chooses **sell** then program works like previous one except for one thing. You have to make sure that user cannot sell more games than he added. In other words, allow user to sell games until there are no more games in inventory.
- All discount rules from previous program apply here.

(**Note:** at this stage you do not have to match ids when selling and adding since you need *arrays* for this.) Name your class **GameStore3**.

(**Note:** unlike other primitive data types like **int** and **double**, to compare two **String** variables **s1** and **s2** use **s1.equals(s2)**. Do NOT use **s1 == s2**)

Here is a sample run to show different cases:



## Sample Run

```
*****
*                               Welcome to Gaming Center :)                               *
*                               -----                                                  *
*                               Please enter one of the following options:                *
*                               1) add ==> this allows you to add a game to inventory      *
*                               2) sell ==> this allows you to sell games to a customer    *
*                               3) exit ==> to end this program                          *
*                               *                                                         *
*****
Enter your option :> sell ↵
Sorry. There are no more games in store :(
*****
*                               Welcome to Gaming Center :)                               *
*                               -----                                                  *
*                               Please enter one of the following options:                *
*                               1) add ==> this allows you to add a game to inventory      *
*                               2) sell ==> this allows you to sell games to a customer    *
*                               3) exit ==> to end this program                          *
*                               *                                                         *
*****
Enter your option :> add ↵
Please, enter game id (-1 to end): 1 ↵
Please, enter game id (-1 to end): 2 ↵
Please, enter game id (-1 to end): 3 ↵
Please, enter game id (-1 to end): -1 ↵
*****
*                               Welcome to Gaming Center :)                               *
*                               -----                                                  *
*                               Please enter one of the following options:                *
*                               1) add ==> this allows you to add a game to inventory      *
*                               2) sell ==> this allows you to sell games to a customer    *
*                               3) exit ==> to end this program                          *
*                               *                                                         *
*****
Enter your option :> sell ↵
Please, enter game id (-1 to end): 1 ↵
Please, enter the price of next game: 100 ↵
Please, enter game id (-1 to end): 10 ↵
Please, enter the price of next game: 200 ↵
Please, enter game id (-1 to end): 6 ↵
Please, enter the price of next game: 120 ↵
Can not sell more games. Out of stock :(
Total price before discount: 420.0SR
Your discount is: 84.0SR
Total price after discount: 336.0SR
```

```
*****
*                               Welcome to Gaming Center :)          *
*                               -----                              *
*   Please enter one of the following options:                       *
*   1) add ==> this allows you to add a game to inventory          *
*   2) sell ==> this allows you to sell games to a customer        *
*   3) exit ==> to end this program                                 *
*                                                                     *
*****
Enter your option :> exit ↵
Thanks. Goodbye!
```

## Solution

- 1- Use project **lab06**
- 2- Create a new class and name it **GameStore3**. Make sure you choose the `public static void main` option.
- 3- Write the program in following two pages (you can ignore comments).
- 4- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 5- Submit your program to WebCAT through. Ask your TA for help.

```

import java.util.Scanner;
public class GameStore3 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        String option;
        int numOfGames = 0;
        do {
            System.out.println("*****");
            System.out.println("                Welcome to Gaming Center :)                *");
            System.out.println("                -----                *");
            System.out.println("                Please enter one of the following options:                *");
            System.out.println("                1) add ==> this allows you to add a game to inventory                *");
            System.out.println("                2) sell ==> this allows you to sell games to a customer                *");
            System.out.println("                3) exit ==> to end this program                *");
            System.out.println("*****");
            System.out.print("Enter your option :> ");
            option = s.next();
            if (option.equals("sell")){
                if (numOfGames <= 0){
                    System.out.println("Sorry. There are no more games in store :(");
                }
                else {
                    System.out.print("Please, enter game id (-1 to end): ");
                    int id = s.nextInt();
                    double totalPrice = 0;
                    int num = 0;
                    while (id != -1 && numOfGames > 0){
                        System.out.print("Please, enter the price of next game: ");
                        double price = s.nextDouble();
                        totalPrice += price;
                        num++;
                        numOfGames--;
                        if (numOfGames <= 0){
                            System.out.println("Can not sell more games. Out of stock :(");
                        } else {
                            System.out.print("Please, enter game id (-1 to end): ");
                            id = s.nextInt();
                        }
                    }
                }
            }
        }
    }
}

```

```

    double discount = 0;
    //if more than two copies then use discount
    if (num > 2 ){
        discount = 20.0 / 100;
    }
    System.out.println("Total price before discount: " +
        totalPrice + "SR");
    System.out.println("Your discount is: " +
        (totalPrice - (totalPrice * (1 - discount))) + "SR");
    totalPrice *= (1 - discount);
    System.out.println("Total price after discount: " +
        totalPrice + "SR");
}
} else if (option.equals("add")){
    System.out.print("Please, enter game id (-1 to end): ");
    int id = s.nextInt();
    while (id != -1){
        numOfGames++;
        System.out.print("Please, enter game id (-1 to end): ");
        id = s.nextInt();
    }
}
} while (!option.equals("exit"));
System.out.println("Thanks. Goodbye!");
}
}
}

```

**Done...**