

**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 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 the price of a game: 100 ↵  
Please, enter number of games: 5 ↵  
Total price is: 400.0
```

### Sample Run 2

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

## Sample Run 3

```
Welcome to Gaming Center :).
Please, enter the price of a game: 300 ↵
Please, enter number of games: -1 ↵
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 following (you can ignore comments):

```
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 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 is: " + totalPrice);
        }
    }
}
```

- 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.

## Lab Exercise 2

We are going to change the previous program to add more complex logic to it. The new program should work as following:

- There are two editions for each game, gold and normal edition. Gold edition costs 40% more than a normal edition.
- A customer must buy at least 1 copy of a game (otherwise print "Error"). He cannot mix editions. He has to buy copies of either gold edition or normal edition.
- If a customer decides to buy a gold edition and he buys more than 2 copies then he will get a 20% discount otherwise he will pay regular price.
- If a customer decides to buy a normal edition and he buys more than 3 copies then he will get a 10% discount otherwise he will pay regular price.

Your program should read three input values, a char that represents the type of the game 'g' or 'n' (i.e., gold or normal), the number of copies and the regular price for a game. Then it should print the total cost after discount (if applicable). Name your class **GameStore2**.

(**Hint:** to read a char use `input.next().charAt(0)`)

Here are some sample runs to show different cases:

## Sample Run 1

```
Welcome to Gaming Center :).  
Please, enter the type of the game: g ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 1 ↵  
Total price is: 140.0
```

## Sample Run 2

```
Welcome to Gaming Center :).  
Please, enter the type of the game: g ↵  
Please, enter the price of a game: 150 ↵  
Please, enter number of copies: 3 ↵  
Total price is: 504.0
```

## Sample Run 3

```
Welcome to Gaming Center :).  
Please, enter the type of the game: n ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 3 ↵  
Total price is: 300.0
```

## Sample Run 4

```
Welcome to Gaming Center :).  
Please, enter the type of the game: r ↵  
Please, enter the price of a game: 12 ↵  
Please, enter number of copies: 3 ↵  
Game type unknown.
```

## 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 following (you can ignore comments):

```

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 the type of the game: ");
        char type = s.next().charAt(0);
        System.out.print("Please, enter the price of a game: ");
        double price = s.nextDouble();
        System.out.print("Please, enter number of copies: ");
        int num = s.nextInt();
        if (num < 1)
            System.out.println("Error");
        else {
            double totalPrice = 0;
            switch (type){
                case 'g':
                    price *= (1 + 40.0 / 100);
                    totalPrice = price * num;
                    //if more than two copies then use discount
                    if (num > 2 ){
                        double discount = 20.0 / 100;
                        totalPrice *= (1 - discount);
                    }
                    System.out.println("Total price is: " + totalPrice);
                    break;
                case 'n':
                    totalPrice = price * num;
                    //if more than two copies then use discount
                    if (num > 3 ){
                        double discount = 10.0 / 100;
                        totalPrice *= (1 - discount);
                    }
                    System.out.println("Total price is: " + totalPrice);
                    break;
                default:
                    System.out.println("Game type unknown.");
            }
        }
    }
}

```

- 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.

### Lab Exercise 3

We are going to change the previous program to add even more complex logic to it. The new program should change discount rules as following:

- If a customer decides to buy a gold edition and he buys more than 2 copies of then he will get a 20% discount on all except first one otherwise he will pay regular price.
- If a customer decides to buy a normal edition and he buys more than 3 copies of a normal edition game then he will get a 10% discount on all except first two otherwise he will pay regular price.

Name your class **GameStore3**.

Here are some sample runs to show different cases:

#### Sample Run 1

```
Welcome to Gaming Center :).  
Please, enter the type of the game: g ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 1 ↵  
Total price is: 140.0
```

## Sample Run 2

```
Welcome to Gaming Center :).  
Please, enter the type of the game: g ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 2 ↵  
Total price is: 280.0
```

## Sample Run 3

```
Welcome to Gaming Center :).  
Please, enter the type of the game: g ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 4 ↵  
Total price is: 476.0
```

## Sample Run 4

```
Welcome to Gaming Center :).  
Please, enter the type of the game: n ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 1 ↵  
Total price is: 100.0
```

## Sample Run 5

```
Welcome to Gaming Center :).  
Please, enter the type of the game: n ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 3 ↵  
Total price is: 300.0
```

## Sample Run 6

```
Welcome to Gaming Center :).  
Please, enter the type of the game: n ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 4 ↵  
Total price is: 380.0
```

## Sample Run 7

```
Welcome to Gaming Center :).  
Please, enter the type of the game: g ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 0 ↵  
Error
```

## Sample Run 8

```
Welcome to Gaming Center :).  
Please, enter the type of the game: f ↵  
Please, enter the price of a game: 100 ↵  
Please, enter number of copies: 4 ↵  
Game type unknown.
```

## 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 as following (you can ignore comments):

```

import java.util.Scanner;
public class GameStore3 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        System.out.println("Welcome to Gaming Center :).");
        System.out.print("Please, enter the type of the game: ");
        char type = s.next().charAt(0);
        System.out.print("Please, enter the price of a game: ");
        double price = s.nextDouble();
        System.out.print("Please, enter number of copies: ");
        int num = s.nextInt();
        if (num < 1)
            System.out.println("Error");
        else {
            double totalPrice = 0;
            switch (type){
                case 'g':
                    //add cost of first copy without discount
                    double gPrice = price * 1.4;
                    totalPrice = gPrice;
                    //if more than two copies then use discount
                    if (num > 2 ){
                        double discount = 20.0 / 100;
                        double priceBeforeDiscount = gPrice * (num - 1);
                        double priceAfterDiscount = priceBeforeDiscount * (1 - discount);
                        totalPrice += priceAfterDiscount;
                    }
                    else //add cost of remaining copy
                        totalPrice += (num - 1) * gPrice;
                    System.out.println("Total price is: " + totalPrice);
                    break;
                case 'n':
                    //add cost of first copy without discount
                    totalPrice = price;
                    //if more than three copies then use discount
                    if (num > 3 ){
                        double discount = 10.0 / 100;
                        double priceBeforeDiscount = price * (num - 2);
                        double priceAfterDiscount = priceBeforeDiscount * (1 - discount);
                        totalPrice += price + priceAfterDiscount;
                    }
                    else //add cost of remaining one or two copies
                        totalPrice += (num - 1) * price;
                    System.out.println("Total price is: " + totalPrice);
                    break;
                default:
                    System.out.println("Game type unknown.");
            }
        }
    }
}

```

- 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.

## Lab Exercise 4

Convert your program into an interactive game-store managing program. New program should let the user enter data for a new game sale, calculates the revenue and then asks the user if he wants to continue. If the user answers “yes” program should keep reading game sales and calculating the revenue. It only terminates when user answers “no”. (**Bonus:** print total revenue for all sales before terminating program).

(**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 of the program

### Sample Run

```
Welcome to Gaming Center :).
Please, enter the type of the game: g ↵
Please, enter the price of a game: 100 ↵
Please, enter number of copies: 1 ↵
Total price is: 140.0
Do you want to continue? yes or no: yes ↵
Please, enter the type of the game: g ↵
Please, enter the price of a game: 100 ↵
Please, enter number of copies: 2 ↵
Total price is: 280.0
Do you want to continue? yes or no: yes ↵
Please, enter the type of the game: g ↵
Please, enter the price of a game: 100 ↵
Please, enter number of copies: 4 ↵
```

```
Total price is: 476.0
Do you want to continue? yes or no: yes ↵
Please, enter the type of the game: n ↵
Please, enter the price of a game: 100 ↵
Please, enter number of copies: 3 ↵
Total price is: 300.0
Do you want to continue? yes or no: yes ↵
Please, enter the type of the game: n ↵
Please, enter the price of a game: 100 ↵
Please, enter number of copies: 4 ↵
Total price is: 380.0
Do you want to continue? yes or no: no ↵
Goodbye
```

## Solution

- 1- Use the same project **lab06** that you created before
- 2- Create a new class and name it **GameStore4**. Make sure you choose the `public static void main` option.
- 3- Write the program as following (you can ignore comments):

```

import java.util.Scanner;
public class GameStore4 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("Welcome to Gaming Center :).");
        String answer;
        do {
            System.out.print("Please, enter the type of the game: ");
            char type = input.next().charAt(0);
            System.out.print("Please, enter the price of a game: ");
            double price = input.nextDouble();
            System.out.print("Please, enter number of copies: ");
            int num = input.nextInt();
            if (num < 1)
                System.out.println("Error");
            else {
                double totalPrice = 0;
                switch (type){
                    case 'g':
                        //add cost of first copy without discount
                        double gPrice = price * 1.4;
                        totalPrice = gPrice;
                        //if more than two copies then use discount
                        if (num > 2 ){
                            double discount = 20.0 / 100;
                            double priceBeforeDiscount = gPrice * (num - 1);
                            double priceAfterDiscount = priceBeforeDiscount * (1 - discount);
                            totalPrice += priceAfterDiscount;
                        }
                        else //add cost of remaining copy
                            totalPrice += (num - 1) * gPrice;
                        System.out.println("Total price is: " + totalPrice);
                        break;
                    case 'n':
                        //add cost of first copy without discount
                        totalPrice = price;
                        //if more than three copies then use discount
                        if (num > 3 ){
                            double discount = 10.0 / 100;
                            double priceBeforeDiscount = price * (num - 2);
                            double priceAfterDiscount = priceBeforeDiscount * (1 - discount);
                            totalPrice += price + priceAfterDiscount;
                        }
                        else //add cost of remaining one or two copies
                            totalPrice += (num - 1) * price;
                        System.out.println("Total price is: " + totalPrice);
                        break;
                    default:
                        System.out.println("Game type unknown.");
                }//switch
            }//if
        }
    }
}

```

```
        System.out.print("Do you want to continue? yes or no: ");
        answer = input.next();
    } while (answer.equals("yes"));
    System.out.println("Goodbye");
} //main
}
```

- 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.

**Done...**