ST ALOYSIUS COLLEGE

SIXTH FORM
FIRST TERM EXAMINATION 2019
LOWERS

FOUNDED IN 1907 BY THE JESUITS IN MALTA

TIME: 11:00 – 12:00 **DATE: 29 NOVEMBER 2019**

SUBJECT: COMPUTING A-LEVEL (PRACTICAL)

PLEASE NOTE:

- only the official paper provided by College can be used for your answers or rough work.
- no notes or books are allowed in the exam room.
- no pencil cases can be carried in the examination room; only transparent plastic bags are allowed.
- switch off mobile phones and hand them over to the invigilator. Students found in possession of mobile phones or other unauthorized electronic equipment throughout the duration of the exam will receive no mark.
- students caught copying will obtain no mark for the exam.
- except for emergency reasons, no one is permitted to leave the exam room during the first half hour.

Use BlueJ to solve the following problems. Add multi-line comments to the start of each program stating your name and question number.

1. Write a program **Question_1** that asks the user to input a list of whole numbers. To tell the program that no more numbers are to be entered, 0 is inputted by the user. The program then finds:
    a. The smallest number to be entered
    b. How many numbers were a factor of 5

2. Write a program **Question_2** which asks the user to input a positive whole number between 0 and 50. When a valid number is inputted, the program lists all the natural numbers of that number as well as their product.

3. Write a program **Question_3** which displays the following menu to the user:
    1. Input Prices and Quantity
    2. Input discount
    3. Bill Summary and Payment
    4. Quit

    The user is asked to input 5 prices and quantities in option 1. In option 2, the program asks the user to input a discount. Discounts can be given at 0%, 5% or 8%. In option 3 the total before and after discount is shown. The user is then prompted to enter the method of payment: C for Cash and R for Card. If Cash is chosen, the amount paid by the customer is entered and any change due is shown. If Card is entered the message 'Connecting…' is shown. In either case the program stops with the message 'Thank you for your custom' when option 4 is entered. Ensure that the user cannot access options 2 and 3 unless the user has inputted the prices and quantities.

Question 1

```
import java.util.*;

public class Question_1{
   public static void main (String args[]){
      Scanner s = new Scanner(System.in);

      int num = 0;
      int smallest = Integer.MAX_VALUE;
      int multiple = 0;

      do{
         System.out.println("Input a number");
         num = s.nextInt();

         if(num==0){
            System.out.println("Here are your statistics: ");
         }

         else {
         if(num<smallest)
            smallest=num;

         if(num%5==0)
            multiple++;
         }

      }
      while(num!=0);

      System.out.println("The smallest number is " + smallest);
      System.out.println("There were " + multiple + " multiples of 5");
   }
}
```

Question 2

```
import java.util.*;

public class Question_2{
   public static void main (String args[]){
      Scanner s = new Scanner(System.in);

      System.out.println("Input a positive whole number between 0 and 1000");
      int num = s.nextInt();

      while((num<0) || (num>50)){
         System.out.println("Invalid input! Try again");
         num = s.nextInt();
      }

      long product = 1;

      for(int i = num; i>0; i--){
         System.out.print(i + " ");
         product*=i;
         System.out.println();
      }

      System.out.print("\n\nThe product is " + product);
   }
}
```

Question 3

```
import java.util.*;

public class Question_3{
   public static void main (String args[]){
      Scanner s = new Scanner(System.in);

      boolean c1 = false;
      int choice = 0;
      double price = 0;
      int qty = 0;
      double gross = 0;
      int disc = 0;
      double net = 0;
      char payOp = 0;
      double pay = 0;

      do{
         System.out.println("1. Input prices and quantity");
         System.out.println("2. Input discount");
         System.out.println("3. Bill Summary and Payment");
         System.out.println("4. Quit");
         choice = s.nextInt();
         s.nextLine();

         switch(choice){
            case 1: c1 = true;
                  for(int i = 1; i<=5; i++){
                     System.out.println("\n***ITEM " + i + "***");
                     System.out.println("Input price");
                     price = s.nextDouble();
                     System.out.println("Input quantity");
                     qty = s.nextInt();

                     gross += (price*qty);
                  }
                  break;

            case 2: if(c1==false){
                     System.out.println("Choose option 1 first");
```

Question 3

```
                break;
            }
            else{
                System.out.println("Choose a discount");
                System.out.println("1. 0%");
                System.out.println("2. 5%");
                System.out.println("3. 8%");
                disc = s.nextInt();

                switch(disc){
                    case 1: net = gross;
                            break;
                    case 2: net = gross*0.95;
                            break;
                    case 3: net = gross*0.8;
                            break;
                    default:System.out.println("Discount option not available");
                }
            }
            break;
        case 3: if(c1==false){
                System.out.println("Choose option 1 first");
                break;
            }
            else{
                System.out.printf("Total: € %.2f\n",gross);
                System.out.printf("Total less discount: € %.2f\n",net);

                System.out.println("Input method of payment");
                System.out.println("C for Cash and R for Card");
                payOp = s.nextLine().toUpperCase().charAt(0);

                switch(payOp){
                    case 'C':   System.out.println("Input amount");
                                pay = s.nextDouble();
                                if(pay>=net)
                                    System.out.printf("Your change is € %.2f\n",(pay-net));
                                else if(pay<net){
                                    System.out.printf("You are € %.2f",(net-pay));
                                    System.out.println(" short of the correct amount");
```

Question 3

```
                        }
                        break;
                    case 'R':   System.out.println("Connecting...");
                        break;
                    default:    System.out.println("Invalid payment method");
                  }
                }
                break;
          case 4: System.out.println("Thank you for your custom");
                break;
          default: System.out.println("Invalid option");
        }
      }
      while(choice!=4);
   }
}
```