



Department of Statistics & Computer Science
University of Kelaniya
Academic Year – 2022/2023
COSC 12043 / BECS 12243 - Object Oriented Programming
Tutorial 04

1. Run the following code segments and determine why the variable values differ. Justify your answer in each case.

a.

```
public class Example {  
    public static void main(String[] args) {  
        double value_1 = 300.0;  
        byte value_2 = (byte) value_1;  
        System.out.println("value_2 = " + value_2);  
    }  
}
```

b.

```
public class Example {  
    public static void main(String[] args) {  
        long value_1 = 2147483648L;  
        int value_2 = (int) value_1;  
        System.out.println("value_2 = " + value_2);  
    }  
}
```

c.

```
public class Example {  
    public static void main(String[] args) {  
        short value_1 = -150;  
        byte value_2 = (byte) value_1;  
        System.out.println("value_2 = " + value_2);  
    }  
}
```

d.

```
public class Example {  
    public static void main(String[] args) {  
        char value_1 = 169;  
        byte value_2 = (byte) value_1;  
        System.out.println("value_2 = " + value_2);  
    }  
}
```

2. Write a Java program to calculate the monthly salary of an employee and display a formatted pay sheet.
 - a. Accept the following values as command-line arguments (Alice 5678 160 25.0):
 - employeeName - String
 - employeeId, hoursWorked - Int
 - hourlyRate - Double
 - b. Convert each command-line argument from String to the appropriate data type and assign them to variables.
 - c. Calculate the grossSalary using the formula:

$$\text{grossSalary} = \text{hourlyRate} * \text{hoursWorked}$$
 - d. Define a constant TAX_RATE of 10% and calculate taxDeduction as grossSalary * TAX_RATE.
 - e. Calculate the netSalary as grossSalary - taxDeduction.
 - f. Print a formatted pay sheet displaying Employee Name, Employee ID, Hourly Rate, Hours Worked, Gross Salary, Tax Deduction, and Net Salary.

```

-----
      Employee Pay Sheet
-----
      Employee Name:    Alice
      Employee ID:      5678
      Hourly Rate:      25.00
      Hours Worked:     160
      Gross Salary:     4000.00
      Tax Deduction:    400.00
-----
      Net Salary: 3600.00
-----
  
```

3. Write a Java program to calculate the total cost of grocery items with a discount.
 - a. Accept item1Price, item2Price, and item3Price as command-line arguments.
 - b. Calculate the totalCost of the items.
 - c. Define a discount rate DISCOUNT_RATE of 15% and calculate the discountAmount as TotalCost * DISCOUNT_RATE.
 - d. Calculate the finalAmount as TotalCost - discountAmount.
 - e. Print a formatted bill displaying Item Prices, Total Cost, Discount Amount, and Final Amount.

```

-----
                        Grocery Bill
-----
Item 1 Price:  50.00
Item 2 Price:  30.00
Item 3 Price:  20.00
-----
Total Cost:    100.00
Discount (15%): -15.00
-----
Final Amount:  85.00
-----

```

4. Write a Java program to convert a temperature from Celsius to Fahrenheit and display the results in a formatted output.
 - a. Accept the temperature in Celsius as a command-line argument.
 - b. Convert the input from a String to an appropriate data type and assign it to a variable named celsius.
 - c. Calculate the temperature in Fahrenheit using the formula:

$$\text{Fahrenheit} = \left(\text{Celsius} \times \frac{9}{5} \right) + 32$$

- d. Print the results in a formatted output displaying Celsius and Fahrenheit values.

If the command-line argument provided is 25, the output should be:

```

Temperature in Celsius: 25.00°C
Converted Temperature in Fahrenheit: 77.00°F

```

5. Write a Java program that accepts the following values as command-line arguments: the starting balance in the bank account, the amount deposited into the account, and the amount withdrawn from the account. Then, format and display the bank account summary as follows:

```

-----
      Bank Account Summary
-----
Initial Balance:  1000.00
Deposit Amount:   500.00
Withdrawal Amount: 200.00
-----
Final Balance:    1300.00
-----

```