CP 215 Object Oriented Programming in Java
PRACTICAL_2

2.1 The objective of this practical is to emphasis on the Basics of Java program structure.

1. Write Java statements that accomplish each of the following tasks:
   a) Display the message "Enter an integer: ", leaving the cursor on the same line.
   b) Assign the product of variables b and c to variable a.
   c) Use a comment to state that a program performs a sample payroll calculation.

2. Write an application that displays the numbers 1 to 4 on the same line, with each pair of adjacent numbers separated by one space. Use the following techniques:
   a) Use one System.out.println statement.
   b) Use four System.out.print statements.
   c) Use one System.out.printf statement.

3. Write an application that asks the user to enter two integers, obtain them from the user and calculate and prints their sum, product, difference and quotient (division).

4. Write an application that asks the user to enter two integers, obtains them from the user and displays the larger number followed by the words "is larger". If the numbers are equal, print the message "These numbers are equal".

5. Write an application that inputs three integers from the user and displays the sum, average, product, smallest and largest of the numbers.

6. Case study

Write Java application that utilizes the Scanner class to interact with users via the console. When the program starts, it prompts the user to enter their name, capturing this input using the Scanner object. After receiving the name, the application asks for the user's age, again using the Scanner to read the input. Once both pieces of information are collected, the program constructs a personalized greeting message that includes the user's name and age. For instance, if a user named Alice, who is 25 years old, enters her information, the application will respond with a message like, “Hello, Alice! You are 25 years old.”

7. Write an application that inputs from the user the radius of a circle as an integer and prints the circle’s diameter, circumference and area using the floating-point value 3.14159 for π(You may also use the predefined constant Math.PI for the value of π). Use the following formulas (r is the radius):

diameter = 2r
circumference = 2πr
area = πr2

8. Write a program that inputs five numbers and determines and prints the number of negative numbers input, the number of positive numbers input and the number of zeros input.

9. (Body Mass Index Calculator) We introduced the body mass index (BMI) calculator in Exercise 1.10. The formulas for calculating BMI are:

$$BMI = \frac{weightInKilograms}{heightInMeters \times heightInMeters}$$

Create a BMI calculator that reads the user's weight in kilograms and height in meters, then calculates and displays the user's body mass index. Also, display the following information from the Department of Health and Human Services/National Institutes of Health so the user can evaluate his/her BMI:

BMI VALUES

Underweight: less than 18.5
Normal: between 18.5 and 24.9
Overweight: between 25 and 29.9
Obese: 30 or greater

10. Research several car-pooling websites. Create an application that calculates your daily driving cost, so that you can estimate how much money could be saved by car pooling, which also has other advantages such as reducing carbon emissions and reducing traffic congestion. The application should input the following information and display the user's cost per day of driving to work:

a*) Total miles driven per day.*
b) Cost per gallon of gasoline.
c) Average miles per gallon.
d) Parking fees per day.
e) Tolls per day.