

**Programming Fundamentals LAB – Spring 2021**  
(BS-IT-F20 Morning & Afternoon)

**Lab # 2**

**Instructions:**

- **Attempt the following tasks exactly in the given order.**
- **Indent** your pseudo-code properly.
- Use meaningful variable names. Use the **camelCase** notation to name variables.
- Use meaningful prompt lines/labels for all input/output that is performed by your algorithms.

You are required to write algorithm in **pseudo-code** form and draw **flowchart** for each of the following tasks:

**Task # 1**

Design an algorithm that asks the user to enter two integers, obtains the from the user and prints their sum, product, difference, quotient and reminder.

**Task # 2**

Design an algorithm that asks the user to enter two integers, obtains the numbers from the user, then prints the larger number followed by the words “is larger”. If the numbers are equal, print the message “These numbers are equal”.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).

**Task # 3**

The area of a circle is the  $\pi r^2$ , where  $\pi = 3.14$ . Design an algorithm that asks for the radius of two circles. The algorithm should tell the user which circle has the greater area, or whether the areas are the same.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).

**Task # 4**

A book store awards points to its customers based on the number of books purchased each month. The points are awarded as follows:

- If a customer purchases 0 books, he or she earns 0 points.
- If a customer purchases 1 book, he or she earns 5 points.
- If a customer purchases 2 books, he or she earns 15 points.

- If a customer purchases 3 or more books, he or she earns 30 points.

Design an algorithm that asks the user to enter the number of books that he or she has purchased this month and displays the number of points awarded.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).

### **Task # 5**

Design an algorithm that asks the user to enter **two** integers, and determines and displays the larger number.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).).

### **Task # 6**

Design an algorithm that asks the user to enter an integer, and determines whether the integer is Even or Odd.

**Hint:** Use the modulus (%) operator.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).

### **Task # 7**

Design an algorithm which asks the user to enter a 3-digit positive integer. Then, the algorithm should calculate and display the sum of the digits of that integer. For example, if the user enters 786, then your algorithm should display 21 on screen.

### **Task # 8**

Design an algorithm that takes two integers from the user, displays them on screen, **swaps** them, and again displays them on screen. For example, if the user enters 10 and 15, then your algorithm stores them in variable **a** and **b** respectively. After swap, variable **a** and **b** have 15 and 10 values respectively.

### **Task # 9**

Design an algorithm that takes the marks obtained by a student in a course and determines whether the student was PASS or FAIL in the course. Assume that the passing marks are 50. Your algorithm should display an appropriate error message, if the marks entered by the user are negative or greater than 100.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).

### **Task # 10**

Design an algorithm that asks the user to enter a 3-digit positive integer, and stores its reverse in another variable, and then, displays both integers on screen.

### **Task # 11**

Design an algorithm that asks the user to enter **three** integers, and determines and displays the largest number.

**Note:** In your algorithm, you are only allowed to use **if** statement (one-way selection). You are **NOT** allowed to use **if-else** statement (two-way selection).

### **Task # 12**

In a right triangle, the square of the length of one side is equal to the sum of the squares of the lengths of other two sides. Design an algorithm that prompts the user to enter the lengths of three sides of a triangle and then displays a message indicating whether the triangle is a right triangle or not.