

## **LAB 02: Variables, Data Types and Console Input/Output**

### **1. Scope of Knowledge:**

- Represent an algorithm using a flowchart
- Basic structure of a C program
- Identifiers naming rules
- Read notifications, troubleshoot while debugging programs
- Using printf() function

### **2. Materials/Softwares/Tools:**

- Visual Studio Code
- Draw IO (online) or Microsoft Word

### **3. Coding Convention:**

- All identifiers must be in English and lower case
- Follow the valid identifiers naming rules in C
- Tab is 4 characters
- Curly braces must be aligned
- Statements in curly brackets must be indented by 1 tab

### **4. Exercise:**

#### **Exercise 1:**

Write a C program to display the byte count of all data types.

#### **Exercise 2:**

Draw a flowchart and write a C program to declare 2 variables a, b of integer type and display:

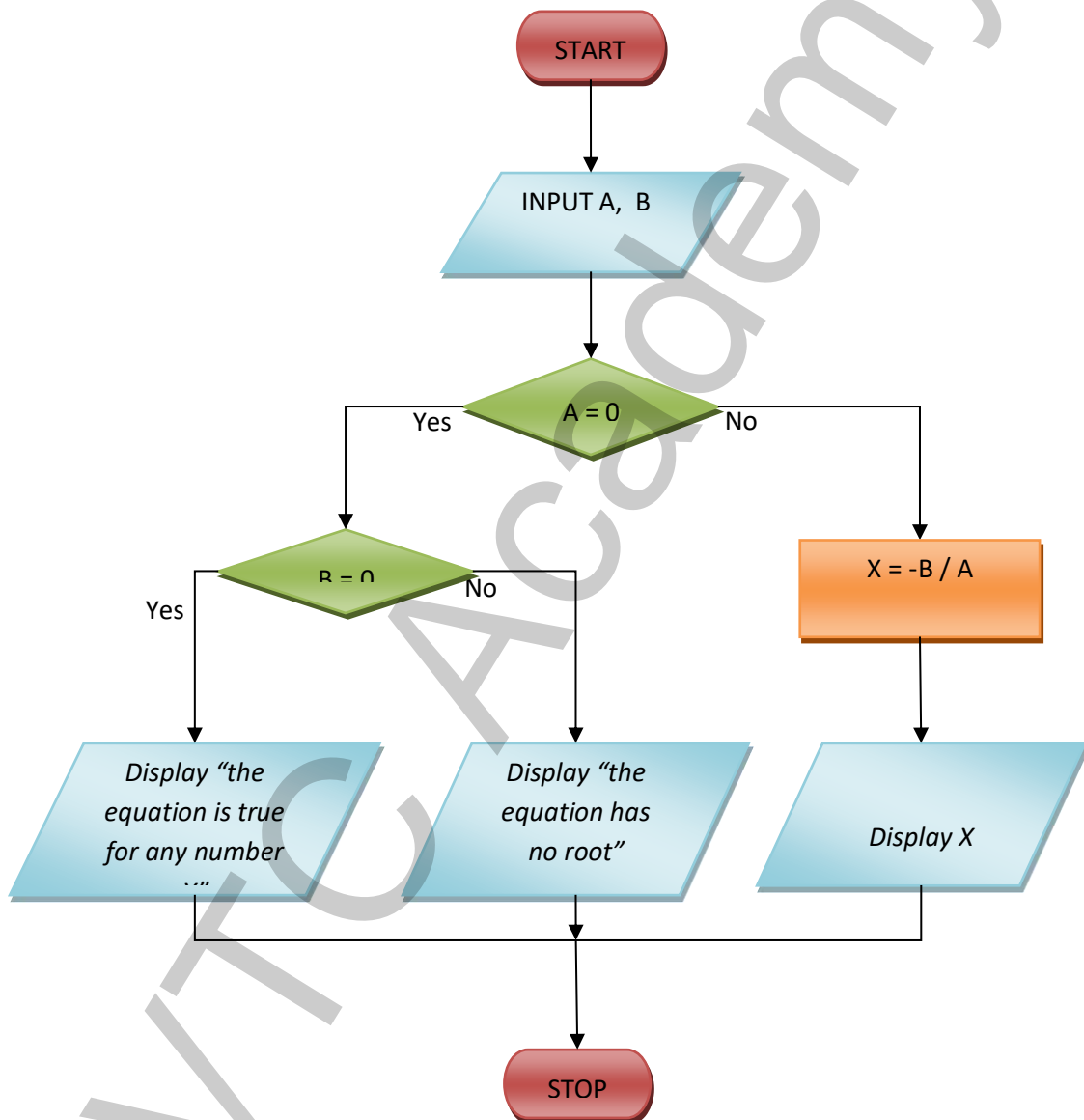
1. Sum of a and b
2. Subtraction of a and b

3. Multiplication of a and b

4. Division of a and b

### Exercise 3:

Which algorithm does the following flowchart perform? If you enter  $A = 7$ ,  $B = 0$ , what will be the result?



**Exercise 4:**

Draw flowcharts for the following problems:

1. Enter an integer  $n$  to find the number  $m$  such that:  $1 + 2 + 3 + \dots + m \leq n$
2. Calculate  $n!$ :
  - a.  $n! = 1 * 3 * 5 * \dots * n$  (if  $n$  is odd)
  - b.  $n! = 2 * 4 * 6 * \dots * n$  (if  $n$  is even)

**Exercise 5\*:**

Draw a flowchart program that requires input of a number  $n$  and displays the first  $n$  numbers in the Fibonacci sequence.

The Fibonacci sequence starts: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...