LAB 03: Expressions, Operators and Type Casting

1. Scope of Knowledge:

- Declare and use variables
- Understand operator types, expressions, and operator precedence
- Convert between data types
- Understand input/output functions with formats: scanf(), printf()
- Understand character input/output functions: getchar(), putchar()

2. Marterials/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 identifers 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:

Note: Students must draw a flowchart describing the algorithm before programming for each problem.

Exercise 1:

Write a program to input 02 numbers num1, num2, swap their values and then increase the value of each variable by 1 unit. And then show results.

Exercise 2:

Given the following expression: exp = $x^3 + 3x^2 + 3xy^2 + y^3$ where x, y are the values entered from the keyboard. Calculate the value of the expression and display the result.

Exercise 3:

Given 2 integer variables i = 5 and j = 7. Write a program to display the result of (i / j). The result must be correct to 7 decimal places.

Exercise 4:

Write a program that inputs the number of kilometers and converts them to miles.

Hint: 1m = 0.000621371192 mile.

Exercise 5:

Indicates that the PI constant available in C is M_PI (in the <math.h> library). Write a program to input the radius and height of the cylinder. Calculate and display the base area and volume of a circular cylinder.

Exercise 6*:

Write a program that uses bitwise operators with 2 integers entered from the keyboard and then displays the results on the screen (and, or, xor, not).