Lab 2
Printing - Manual Compilation
Variables - Arithmetic Operations

1 Lab Objectives

- Practicing printing to the screen with different special characters.

- Learning how to write and compile programs without using an IDE.

- Introducing variables and simple arithmetic operations.

- Using input obtained from users in programs.

2 Printing

2.1 Exercise 1

Write a C program that executes the following statement. Can you guess what the program prints?
printf("*\n**\n***\n****\n");

2.2 Exercise 2

Write a C program that does the following:

1. Use one printf statement and use tabs "\t" to print the following shape:

```
*********
*       *
*       *
*       *
*       *
*       *
*********
```

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2. Use multiple printf statements to print the following shape:

```
    ***
   *   *
  *     *
 *       *
 *       *
  *     *
   *   *
    ***
```

2.3 Exercise 3

Write a C program that writes the **exact** following text on the screen. (Search online for special characters not mentioned in the session):

"Ahmed said: "I searched online and found that \, ", new lines ('\n') and tabs ('\t') are among the special characters."
Mohamed replied: "Great, I also managed to make a beep sound using the special character '\a'. Hear this .." "

3 Manual Compilation

This part will be illustrated and done in the lab session. **No deliverables are required for this section**.

1. Write the "Hello World" C program in a simple text editor (notepad, gedit, .. etc).

2. Save the file under "<name>.c", where <name> is any name of your choice.

3. Open the command prompt (Start → Run → cmd).

4. Navigate (using "cd" command) to the directory where you saved your source file.

5. Invoke the compiler manually: gcc <source.c> -o <outputName>

6. Run the generated executable file by typing its name in the command prompt.

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4 Variables and Arithmetic Operations

4.1 Problem 1 - Average Grade

Write a program that prompts the user to enter grades for five students. The program then computes and outputs the average grade.

4.2 Problem 2 - Circles

Write a program that reads in the radius of a circle, then uses this radius to print the following (Consider the value of $\pi=3.14159$):

- Circle's diameter (2 * radius).

- Circle's circumference (2 * π * radius).

- Circle's area (π * radius * radius).

Note that you are required to define π as a named constant "PI" using "#define".

5 Notes

- You can prepare the coding exercises at home, or you can write them during the lab session. But you need to try them at home first!

- You are required to implement the problems at home, the lab will be for discussion only. You should bring the programs on your laptop or on a flash memory.

- Cheating will be severely penalized (for both parties). So, it is better to deliver nothing than deliver a copy!

- You are encouraged to ask any questions on Piazza, or in person.

Good Luck isA :)