Lab 3 Inputs and Outputs in C Programming

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1. Objective

- To practice in C programming input and output functions.
  Before you start it, please make sure you have finished the reading of all the posted notes, announcements about the lab submissions. Please read reference manual if necessary.

Arithmetic Expression, Executable Statements, Partial Codes

It is strongly recommended to keep look over the lectures while working on the lab. This lab is to practice basic C programming skills by using scanf, printf and arithmetic calculations.

2. Procedures of the Lab

Procedure 1- Write a complete code that will take 2 **floating point numbers** as inputs with **`scanf`** function and outputs the result of the multiplication of these two numbers on the screen, for example:

```
This is the function to calculate the product of two inputs.
Input number 1: 5.0
Input number 2: 3.0
The result is: 15.0
```

Please notice that the numbers highlighted in red are the inputs from the keyboard. Try at least two test cases and get the results as screenshots.
Reference of **`scanf`** function: https://www.cplusplus.com/reference/cstdio/scanf/

Procedure 2- Write a complete code that will take 3 **floating-point numbers** as inputs with **`scanf`** function and outputs the average of these three numbers on the screen, for example:

```
This is the function to calculate 3 numbers' average.
Input number 1: 4.0
Input number 2: 8.0
Input number 3: 9.0
The average of these three numbers is: 7.0
```

Please notice that the numbers highlighted in red are the inputs from the keyboard. Try at least two test cases and get the results as screenshots.

Procedure 3 – Based on the requirements below, write a program to convert a temperature in Fahrenheit to the Kelvin scale:

- The program takes a floating-point number ***fah*** as input and prints out the converted floating-point number ***kel*** as output.
- Before taking the inputs, please give a prompt message to indicate what do you expect from the user.
- The output must be printed with 3 digits after the decimal point.
- Try at least two test cases and get the results as screenshots.

3. Lab report submission requirements

Use the lab report template provided online, submit all the following on the blackboard submission folder. Please note that the lab attendance is mandatory to get marks and you need to demo the program(s) required by your professor in the lab class.

A. Submit all your source code (.c files).

B. Submit the screenshots of the running results of procedure 1 to 3 in this section. Each procedure should be a single function. Please clearly mark the procedure's number in the comments. **Each procedure needs to have screenshots for at least two test cases.**

C. Answer the questions without running the program on your computer: determine what are the screen outputs of the following two sections of statement (s)? Please answer this on the report (10%).

```
// Question 1
int i = 2;
int j = 3, k;
k = i * j;
printf ("%d", k);
```

```
// Question 2
int i, j, k;
i = 5, j = 3;
printf ("%d %d", i / j, i % j);
```

D. Pseudocode practice of multiple branches: Write a pseudocode to write a program that has the following arithmetic calculation features **(30%):**

1. Get two floating-point numbers from the user and save them to variables ***A*** and ***B***, respectively.
2. Get the input from the user and save it to an integer variable that is called **menuoption**.
3. If the **menuoption** is 1: the program should add A and B, then print the result on the screen.
   If the **menuoption** is 2: the program should subtract A from B, then print the result on the screen.
   If the **menuoption** is 3: the program should multiply A with B, then print the result on the screen.
   If the **menuoption** is 4: the program should divide A by B, then print the result on the screen.
   If **menuoption** is any other number: the program should print out the message "**Wrong selection of menu option!**" and exit the program.
4. **Please note that you are NOT allowed to use 5 "if" consecutive statements to implement this code.**

Hint: You can use **one of the following two branch styles** to implement the pseudocode:

The following statements will decide if variable X is letter "A", or "B" or others (Please pay attention to the indents of these statements.

Style 1: Using "If … else if … else if … … else" statements.	Style 2: Using "switch… case" statements:
if X is 1 … **else if X is 2** … **else if**… …	switch (X): case 1: …… // the operations when X = 1 break; case 2: …… // the operations when X = 2 break; default : // all other cases. …… break;