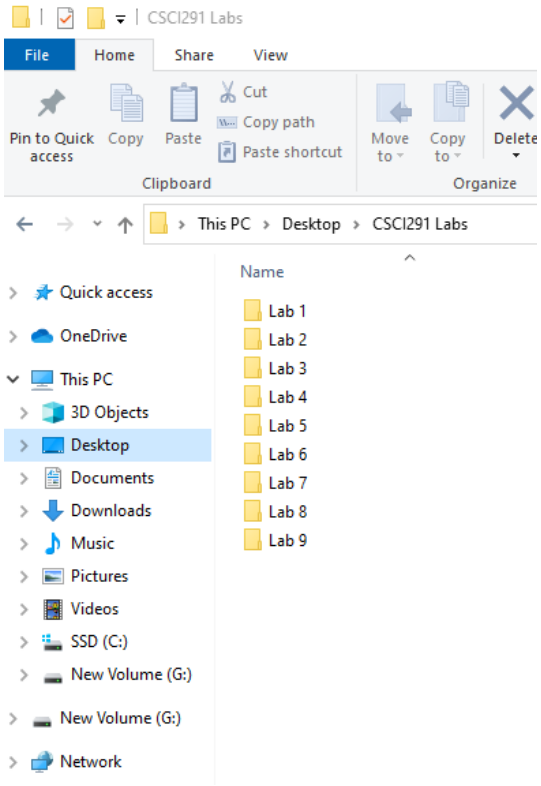
UNIVERSITY OF WOLLONGONG IN DUBAI

LAB 1: Introduction to Visual Studio Code IDE and C Programming

This lab gives and introduction to :

- The C Integrated Design Environment (IDE): Visual Studio Code (VSCode) programming environment
- C programming through short tasks involving basic I/O operations and mathematical expressions

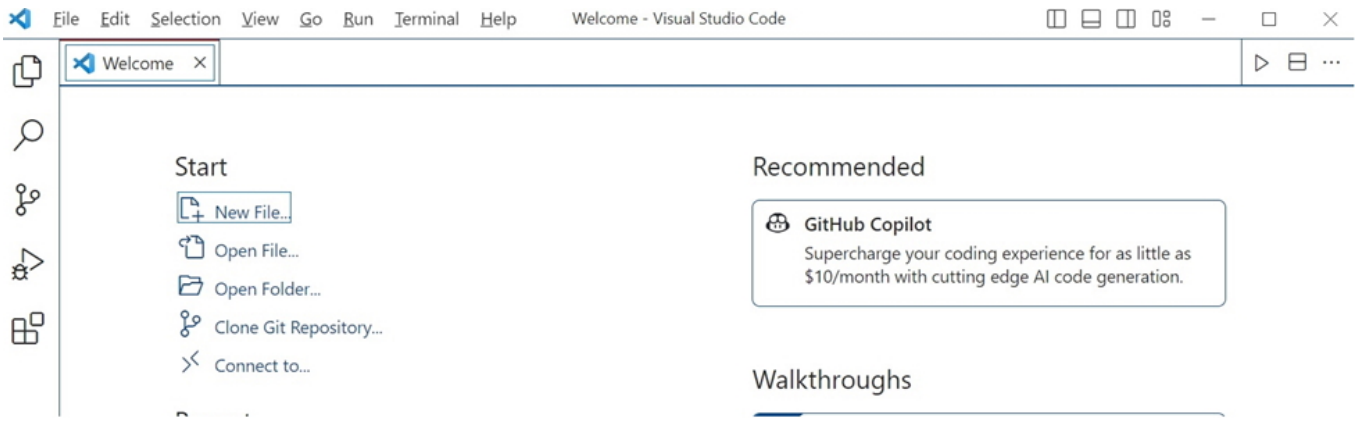
For each lab, create a new folder preferably named as below:



TASK 1: HELLO WORLD Program

To create a new program on VSCode, launch VSCode, then select from the Menu: File -> New File.

Alternatively, you can simply click on the "New File" on the front interface of the IDE as shown below:



Once an editor for your named C file is opened, type the following code:

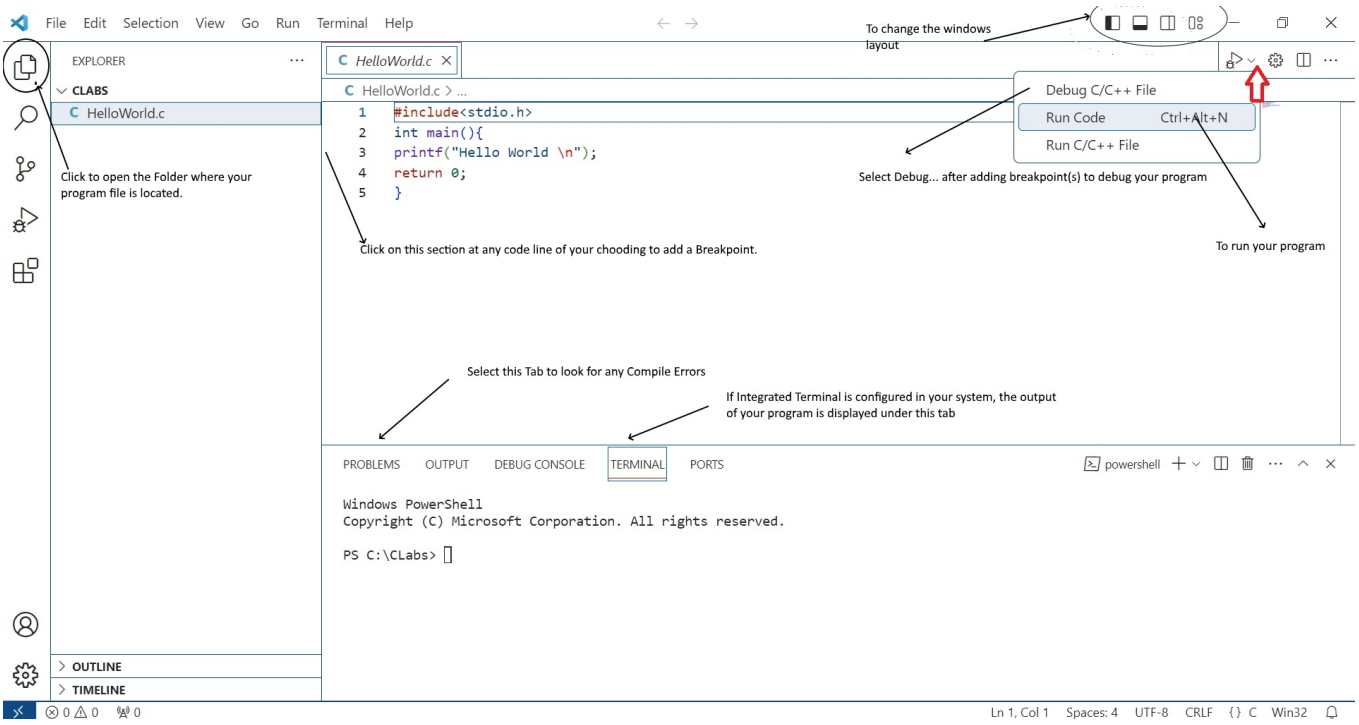
```
#include<stdio.h>
int main(){
printf("Hello World \n");
return 0;
}
```

Save your program (always do so after/while editing your program) using Ctrl-S or from the Menu : File -> Save.

Run the program by clicking on on the drop down symbol, see Red Arrow in the figure below, and selecting "Run Code".

The figure annotates other useful IDE settings.

Check the Terminal Tab for the output of the program



A few notes about this first program:

- The #include command is a pre-processor directive to load the stdio library.
- Execution of C programs always start in the function main
- There are other signatures for main as we will see during the term.

- Although a return type is declared, nothing needed to be returned.
- The printf method is used for screen output.
- To write on a new line, the "newline" character \n is explicitly required in the printf arguments.

Remove a semi-colon at the end of a program statement, then try to compile and run the program. What happens?

TASK 2: Print statements

Download the file "format.c" from Moodle, open it in VSCode. Run the program and explain how each print message in the program execution corresponds to the format expression in the printf statement of the program.

TASK 3: FAHRENHEIT to CELCIUS Conversion

Type in the below C code, which aims to convert a Fahrenheit degree to Celsius, in VSCode; compile and run the program:

a) Test the program with different input values to verify its correctness[1]. Use the following test cases: input= 32, output=0; input= 95, output 5.

b) Try different formatting options for printf() and scanf(). You may also try wrong arguments to see how they may affect the execution of your program.

```
#include <stdio.h>            /* give access to the stdio.h library */

#define CONV_FACTOR     (5.0/9)     /* definition of a constant */

int main(void)

{

float celsTemp;   /* celsius - variable declaration */

float fahrTemp;   /* fahrenheit - variable declaration */

printf("Enter the temperature in   Fahrenheit:");

scanf("%f", &fahrTemp );

celsTemp = CONV_FACTOR * (fahrTemp - 32);  /*convert to celsius */

printf("Celsius temperature =%.1f \n" , celsTemp);

return 0;

}
```

[1] You can use the attached `Far2Cel.xls` file to verify the program output

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TASK 4: CELCIUS to FAHRENHEIT Conversion

Inspired by the above program, write a new program that converts a temperature in Celsius to Fahrenheit according to the equation:

fahrenheit = 1.82 celsius + 32*

Compile, run and test thoroughly your program.

TASK 5: Basic I/O Operations and Mathematical Expressions

4.1 Write a C program that asks the user for:

a) two integers and outputs them in return along with their sum
b) two floats and outputs their product.
c) a character and prints it twice in the same row.

4.2 Write a C program with a variable integer initialized to 9 with the following statements:

- a = - a;
- a - = a;
- --a;
- a = (a==a);

Add a `printf` statement after each of the above expressions. Compile and run the resulting program.Explain how the values output in the program execution correspond to the program statements above.

Submission

You have to submit all your C program files on moodle along with screenshots of your testing results under Lab 1 submission.

Marking :

This task will be graded as PASS or FAIL. One last chance is given to those with FAIL grade to pass the lab assessment, otherwise -10% penalty will be applied on the aggregate lab marks.