## Question 1. Using C on ECF

Start Visual Studio Code by typing code inside the Terminal. Install the C/C++ tools. Save a .c file into a folder of your choice (e.g. a.c) into a folder of your choice (e.g. /u/username/Desktop/ESC190/Lab1). Now, open the folder using VS Code.

## Question 2.

In your main function, define the variable int a and initialize it to 5. Now, write a function which does not return anything, but can set the value of an integer to 10.

Use this function to set the value of **a** to 10.

Use printf to demonstrate that the value of a changed.

Now, put a breakpoint at int a = 5, and trace the code.

Now, write a similar function in Python, and point out the similarities and/or differences.

#### Question 3.

In main(), initialize an array of chars by setting up a char arr[100]. Now, write a function that would change the contents of the array.

Now, write a similar function in Python, and point out the similarities and/or differences.

#### Question 4.

Implement a function that performs https://en.wikipedia.org/wiki/Insertion\_sort#Algorithm. The function should take in an array of integers, and modify the array so that it's sorted in increasing order.

Here is code to print out an array of integers using a for-loop and a while-loop in C.

```
int i = 0;
int a[5] = {2, 3, 4, 5, 6};
// initialize i to 0, run the loop while i < 5, and increase i by 1 every time;
// Here, i++ is the same as i = i + 1
for(i = 0; i < 5; i++){
    printf("%d\n", a[i]);
}
i = 0;
while(i < 5){
    printf("%d\n", a[i]);
    i++; // same as i = i + 1
}
```

#### Question 5.

Write a function that, without using **strlen**, returns the length of a string given by a pointer to the first character in a string

What is the runtime complexity of this function?

## Question 6.

Write a function void seq\_replace(int \*arr1, unsigned long arr1\_sz, int \*arr2. unsigned long arr2\_sz) which takes in two arrays arr1 and arr2 and their sizes, and replaces every appearances of arr2 in arr1 with all 0's.

For example int a[] = {5, 6, 7, 8, 6, 7}; int b[] = {6, 7}; seq\_replace(a, 6, b, 2); should result in a being {5, 0, 0, 8, 0, 0} What is the runtime complexity of this function?

# Question 7.

Make sure that you can use VS Code on your laptop.

The recommended method is to connect to

remote.ecf.utoronto.ca. The altenative is to install MinGW on Windows laptops and or gcc on Mac.