

CMPT 125 D100 LAB1

TA

TOPICS FOR TODAY

- Basic commands in Linux
- VS Code configuration
- Hello World (VS Code)
- Hello World (Command Line)

Basic commands in Linux

- pwd : will give you the address of directory you are in.
- ls : use it to show the files and directories that are in the directory you are in.

```
sepidh@csil-cpu8:~$ pwd
/home/sepidh
sepidh@csil-cpu8:~$ ls
Android  Documents  Music      Public     Templates  'VirtualBox VMs'
Desktop  Downloads  Pictures   sfuhome    Videos
```

sepidh@csil-cpu8:~\$

Basic commands in Linux

- `cd` : To navigate through the Linux directories and files. if you write `cd` and press tab it will show you possible directories you can enter using `cd`, you can write part of file name to make the search space for that smaller. (use `cd ..` to go backward.)

```
sepidh@csil-cpu8:~$ ls
Android  Documents  Music      Public     Templates  'VirtualBox VMs'
Desktop  Downloads  Pictures    sfuhome    Videos

sepidh@csil-cpu8:~$ cd
Android/      Documents/    Music/        Templates/
.android/     Downloads/    Pictures/     .vagrant.d/
.cache/       .gnupg/       Public/       Videos/
.CLion/       .GoLand/     .PyCharm/    VirtualBox VMs/
.conda/       .gradle/     .RubyMine/   .vscode-server/
.config/      .IntelliJIdea/ sfuhome/
Desktop/      .local/      .ssh/

sepidh@csil-cpu8:~$ cd D
Desktop/ Documents/ Downloads/
sepidh@csil-cpu8:~$ cd Desktop
sepidh@csil-cpu8:~/Desktop$ ls
sepidh@csil-cpu8:~/Desktop$ cd ..
sepidh@csil-cpu8:~$ ls
Android  Documents  Music      Public     Templates  'VirtualBox VMs'
Desktop  Downloads  Pictures    sfuhome    Videos
```

Basic commands in Linux

- mkdir : use this to create new directory
- rm : use these to remove files, and directories. (For directories you need to use rm -r)

```
sepidh@csil-cpu8:~$ ls
Android  Documents  Music      Public     Templates  'VirtualBox VMs'
Desktop  Downloads  Pictures    sfuhome    Videos
sepidh@csil-cpu8:~$ mkdir sepid
sepidh@csil-cpu8:~$ ls
Android  Documents  Music      Public     sfuhome     Videos
Desktop  Downloads  Pictures    sepid      Templates   'VirtualBox VMs'
sepidh@csil-cpu8:~$ rm -r sepid
sepidh@csil-cpu8:~$ ls
Android  Documents  Music      Public     Templates  'VirtualBox VMs'
Desktop  Downloads  Pictures    sfuhome    Videos
sepidh@csil-cpu8:~$
```

Basic commands in Linux

- *: means anything. for example if you say `rm file*.txt` you mean remove all file“something”.txt

```
sepidh@csil-cpu8:~$ ls
Android      Downloads   file.txt    Public      Videos
Desktop      file2.txt   Music       sfuhome     'VirtualBox VMs'
Documents    file3.txt   Pictures    Templates
sepidh@csil-cpu8:~$ rm file*.txt
sepidh@csil-cpu8:~$ ls
Android      Documents   Music       Public      Templates   'VirtualBox VMs'
Desktop      Downloads   Pictures    sfuhome     Videos
```

sepidh@csil-cpu8:~\$ █

Basic commands in Linux

- cp: use cp for copying file and directories, for directories again you need to do cp -r. Same as other command tab can give you possible options for being copied.

```
sepidh@csil-cpu8:~$ ls
Android  Documents  file.txt  Pictures  sfuhome  Videos
Desktop  Downloads  Music     Public    Templates 'VirtualBox VMs'
sepidh@csil-cpu8:~$ cp file.txt file2.txt
sepidh@csil-cpu8:~$ ls
Android  Downloads  Music     sfuhome  'VirtualBox VMs'
Desktop  file2.txt  Pictures  Templates
Documents file.txt   Public    Videos
sepidh@csil-cpu8:~$ cp -r Do
Documents/ Downloads/
sepidh@csil-cpu8:~$ cp -r Downloads Downloads_p
sepidh@csil-cpu8:~$ ls
Android  Downloads  file.txt  Public  Videos
Desktop  Downloads_p Music     sfuhome 'VirtualBox VMs'
Documents file2.txt  Pictures  Templates
sepidh@csil-cpu8:~$
```

Basic commands in Linux

- mv: use mv to move files and directories.

```
sepidh@csil-cpu8:~$ ls
Android      Downloads    file.txt     Public       Videos
Desktop      Downloads_p  Music        sfuhome      'VirtualBox VMs'
Documents    file2.txt   Pictures     Templates
sepidh@csil-cpu8:~$ mv file.txt Downloads/
sepidh@csil-cpu8:~$ ls
Android      Downloads    Music        sfuhome      'VirtualBox VMs'
Desktop      Downloads_p  Pictures     Templates
Documents    file2.txt   Public       Videos
sepidh@csil-cpu8:~$ cd Downloads
sepidh@csil-cpu8:~/Downloads$ ls
file.txt
sepidh@csil-cpu8:~/Downloads$ cd ..
sepidh@csil-cpu8:~$ mv Downloads_p Do
Documents/   Downloads/   Downloads_p/
sepidh@csil-cpu8:~$ mv Downloads_p Downloads
sepidh@csil-cpu8:~$ ls
Android      Documents    file2.txt    Pictures     sfuhome      Videos
Desktop      Downloads    Music        Public       Templates    'VirtualBox VMs'
sepidh@csil-cpu8:~$ cd Downloads/
sepidh@csil-cpu8:~/Downloads$ ls
Downloads_p  file.txt
sepidh@csil-cpu8:~/Downloads$
```


Basic commands in Linux

- find: use to find files and directories.

```
sepidh@csil-cpu8:~$ ls
Android      Downloads   Pictures    sfuhome     'VirtualBox VMs'
Desktop      file2.txt   Public      Templates
Documents    Music       sepid.txt   Videos
sepidh@csil-cpu8:~$ find sepid.txt
sepid.txt
sepidh@csil-cpu8:~$ find *.txt
file2.txt
sepid.txt
sepidh@csil-cpu8:~$
```

Basic commands in Linux

- grep: use it to search in the notepad file. Lines that contain the searched word will be displayed fully.

```
Hi my name is Sepid.  
I am SFU students.  
I study computing science.
```

```
sepidh@csil-cpu8:~$ grep stud sepid.txt  
I am SFU students.  
I study computing science.  
sepidh@csil-cpu8:~$
```

Basic commands in Linux

- **man**: use it to view the reference manuals of a command or utility run in the terminal. The output of the command displays the available man page headings for the specified command.

The list of possible headings includes:

- **Name**: The name of the command.
- **Synopsis**: The command's syntax.
- **Configuration**: Configuration details for a device.
- **Description**: A description of the command.
- **Examples**: Several examples demonstrating the use of the command.
- **Defaults**: The default functions of the command and how they can be overridden.

In the terminal window, type **man** followed by the Linux command name which man page you want to see.

The output is lengthy. Use the mouse scroll wheel, the up and down arrow keys, or the PgDn and PgUp keys to navigate through it.

To exit, press **Q**.

output for **man rm**:

```
RM(1)                                General Commands Manual                                RM(1)

NAME
    rm, unlink - remove directory entries

SYNOPSIS
    rm [-f | -i] [-dIRvWx] file ...
    unlink [--] file

DESCRIPTION
    The rm utility attempts to remove the non-directory type files specified on the command line. If the permissions of the file do not permit writing, and the standard input device is a terminal, the user is prompted (on the standard error output) for confirmation.

    The options are as follows:

    -d      Attempt to remove directories as well as other types of files.

    -f      Attempt to remove the files without prompting for confirmation, regardless of the file's permissions. If the file does not exist, do not display a diagnostic message or modify the exit status to reflect an error. The -f option overrides any previous -i options.

:█
```

VS Code configuration

- download and start the app: <https://code.visualstudio.com>

The image shows the Visual Studio Code website on the left and a screenshot of the VS Code application interface on the right.

Visual Studio Code Website:

- Header: Visual Studio Code, Docs, Updates, Blog, API, Extensions, FAQ, Learn, Search Docs, Download.
- Message: Version 1.74 is now available! Read about the new features and fixes from November.
- Text: Code editing. Redefined. Free. Built on open source. Runs everywhere.
- Download Mac Universal Stable Build button.
- Table of download links:

		Stable	Insiders
macOS	Universal	↓	↓
Windows x64	User Installer	↓	↓
Linux x64	.deb .rpm	↓ ↓	↓ ↓

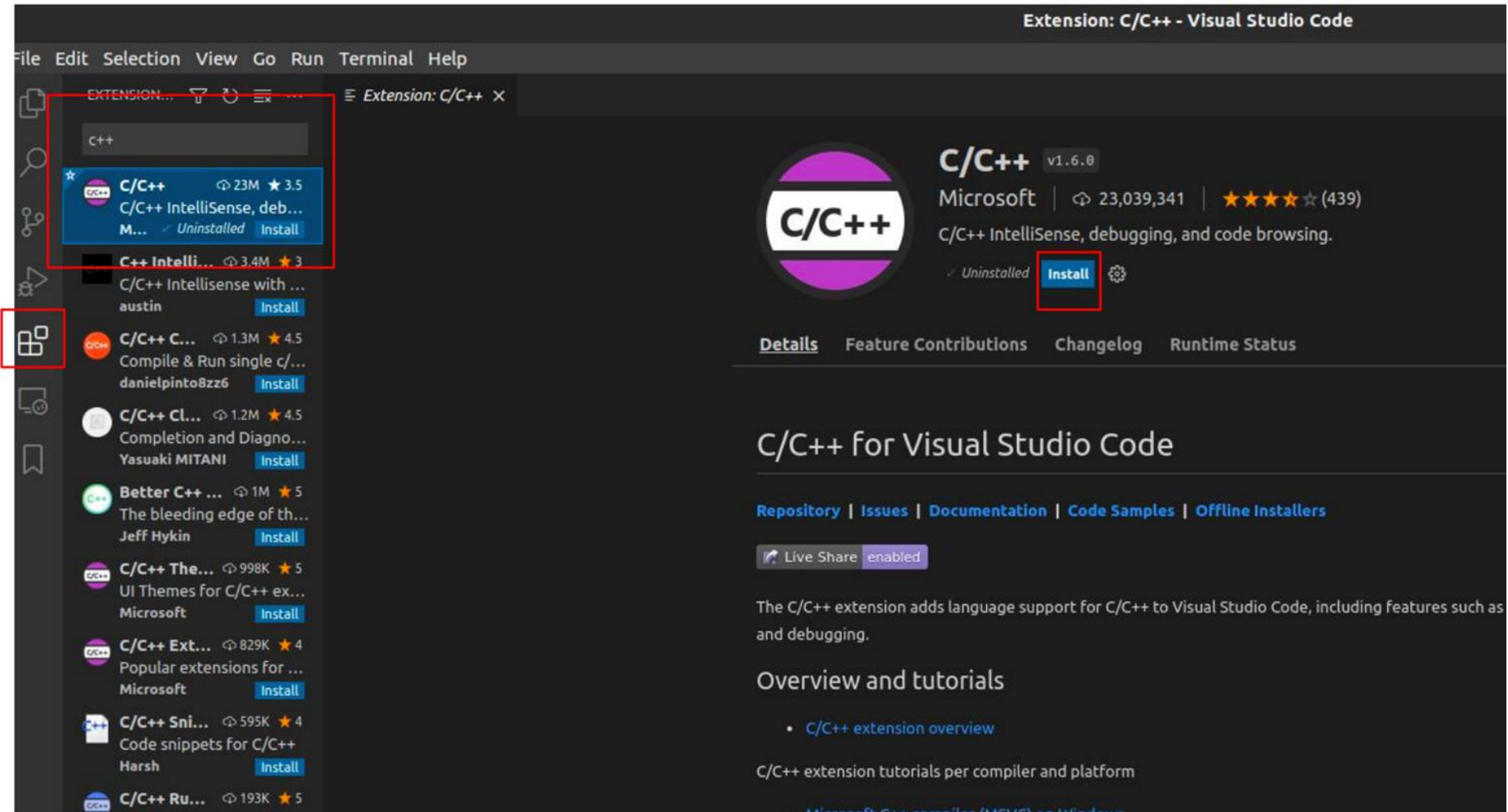
Other downloads or open on web

VS Code Application Interface:

- Extensions: MARKETPLACE
- Search: @sort:installs
- Extensions list: Python, GitLens, C/C++, ESLint, Debugger for C++, Language Support, vscode-icons, Vetur.
- Editor: JS blog-post.js, JS index.js, JS utils.js. Code content is visible.
- Terminal: 2: Task - develop. Output: info [wdm]: Compiling... DONE: Compiled successfully in 26ms.
- Status Bar: master, 0+1, 0, 1, Gatsby Develop (gatsby-graphql-app), Ln 6, Col 21, Spaces: 2, UTF-8, LF, JavaScript.

VS Code configuration

- install c/c++ extension



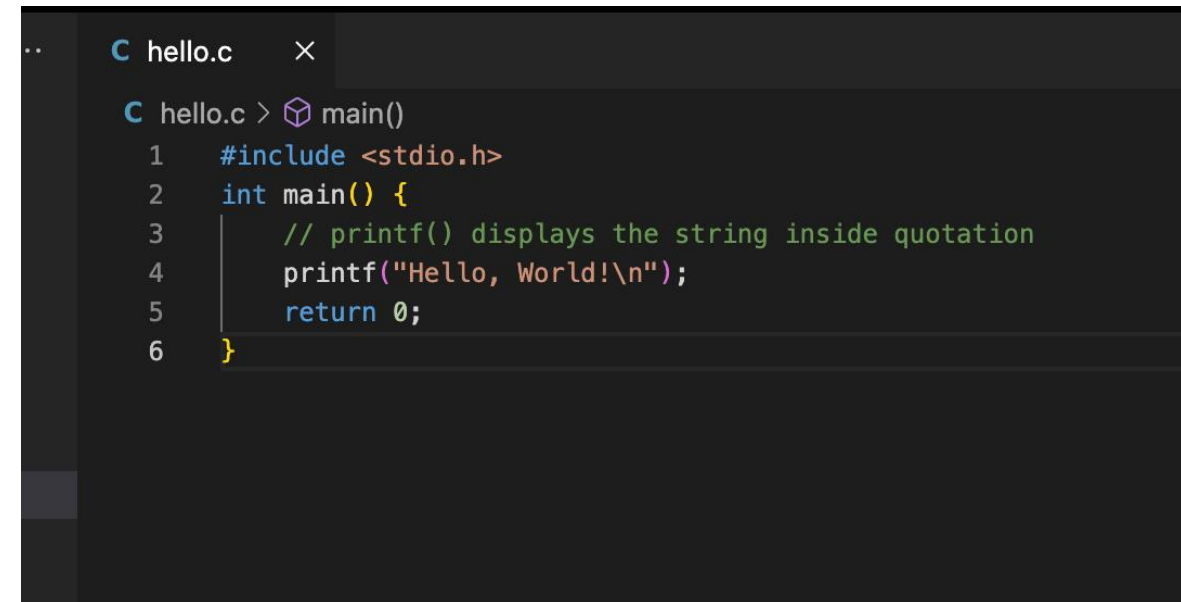
Hello World (VS Code)

- Create a Hello World source code called hello.c

go to File, create new file. paste “hello world” program below in the file and save is as hello.c on your machine.

hello world:

```
#include <stdio.h>
int main() {
    // printf() displays the string inside quotation
    printf("Hello, World!\n");
    return 0;
}
```



```
C hello.c ×
C hello.c > main()
1  #include <stdio.h>
2  int main() {
3      // printf() displays the string inside quotation
4      printf("Hello, World!\n");
5      return 0;
6  }
```

Compile and run your code

If you are in CSIL, you have two main ways to compile and run your code:

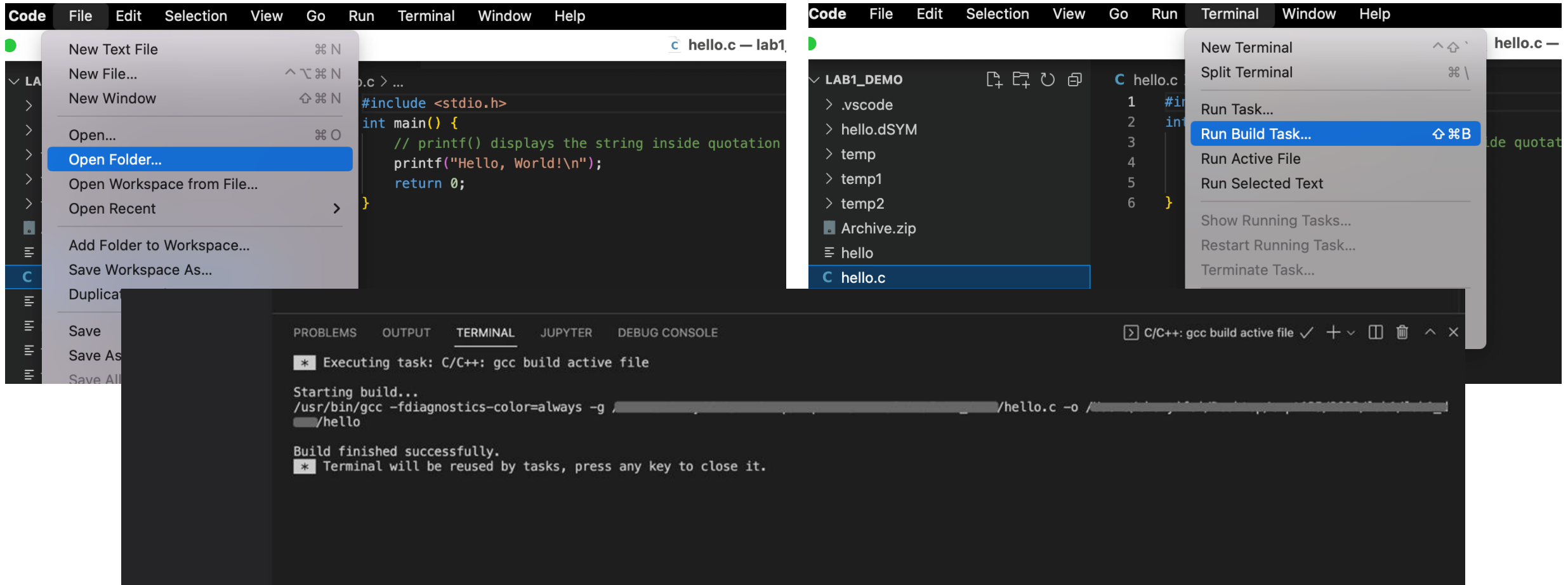
- using VS Code and its own C/C++ compiler
- using the terminal app and CSIL's C/C++ compiler

If you are not in CSIL, you also have two main ways to compile and run your code, provided that you are either still in campus, or connect to SFU VPN when outside campus:

- using VS Code and its SSH tool
- using the terminal app after creating an SSH connection

Compile and run your code using VS Code and its own C/C++ compiler:

- Open the folder where your file is in
- From terminal choose “Run Build Task”, then choose “C/C++: gcc build active file”. Now your code is ready to run and debug using



Compile and run your code **using VS Code and its own C/C++ compiler:**

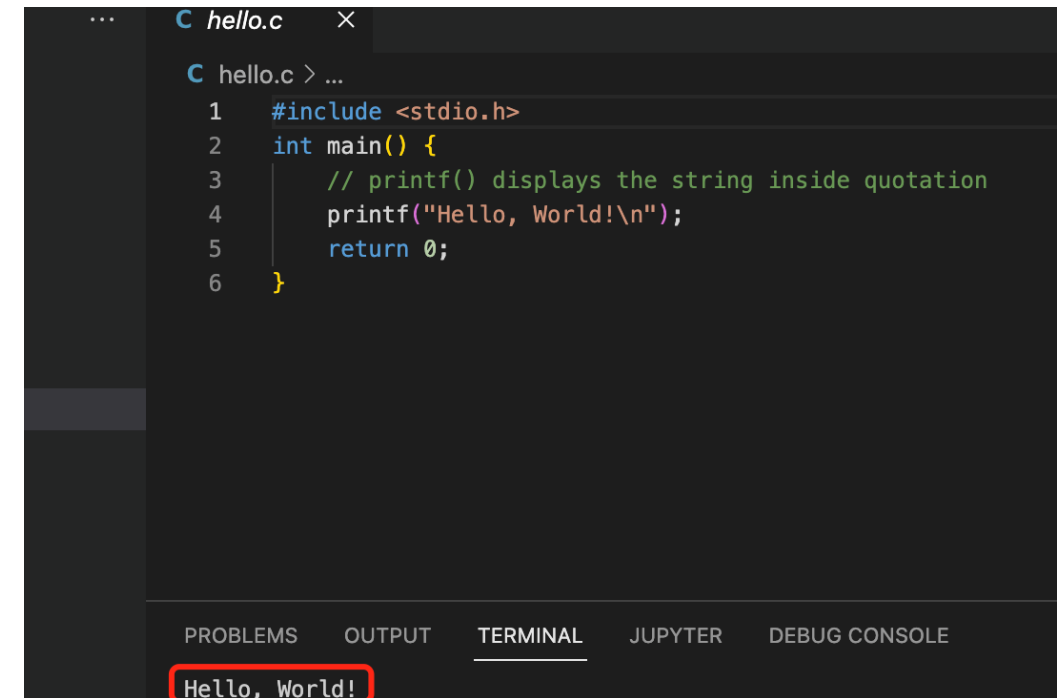
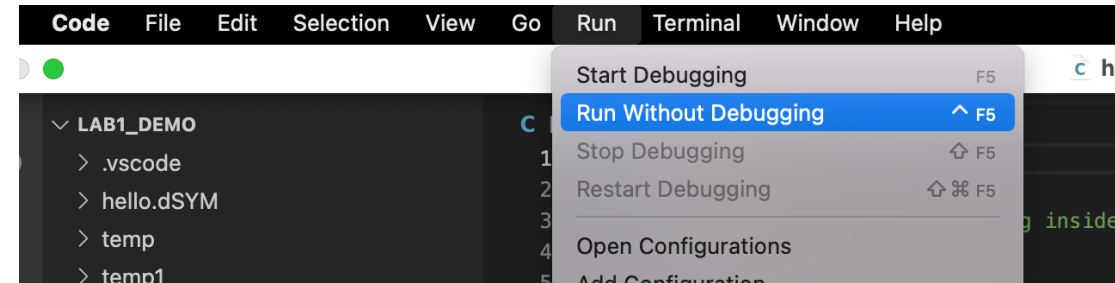
- now your code is ready to run and debug using “Run” in VS code.

In “Run” menu at top choose “Run Without Debugging”.

Then choose C++(GDB, LLDB), and then choose “gcc build and debug active file”.

At terminal down you should be able to see output.

Change “Hello, World!\n” to any sentence you like and see how printed output changes.



Compile and run your code **using VS Code and its own C/C++ compiler:**

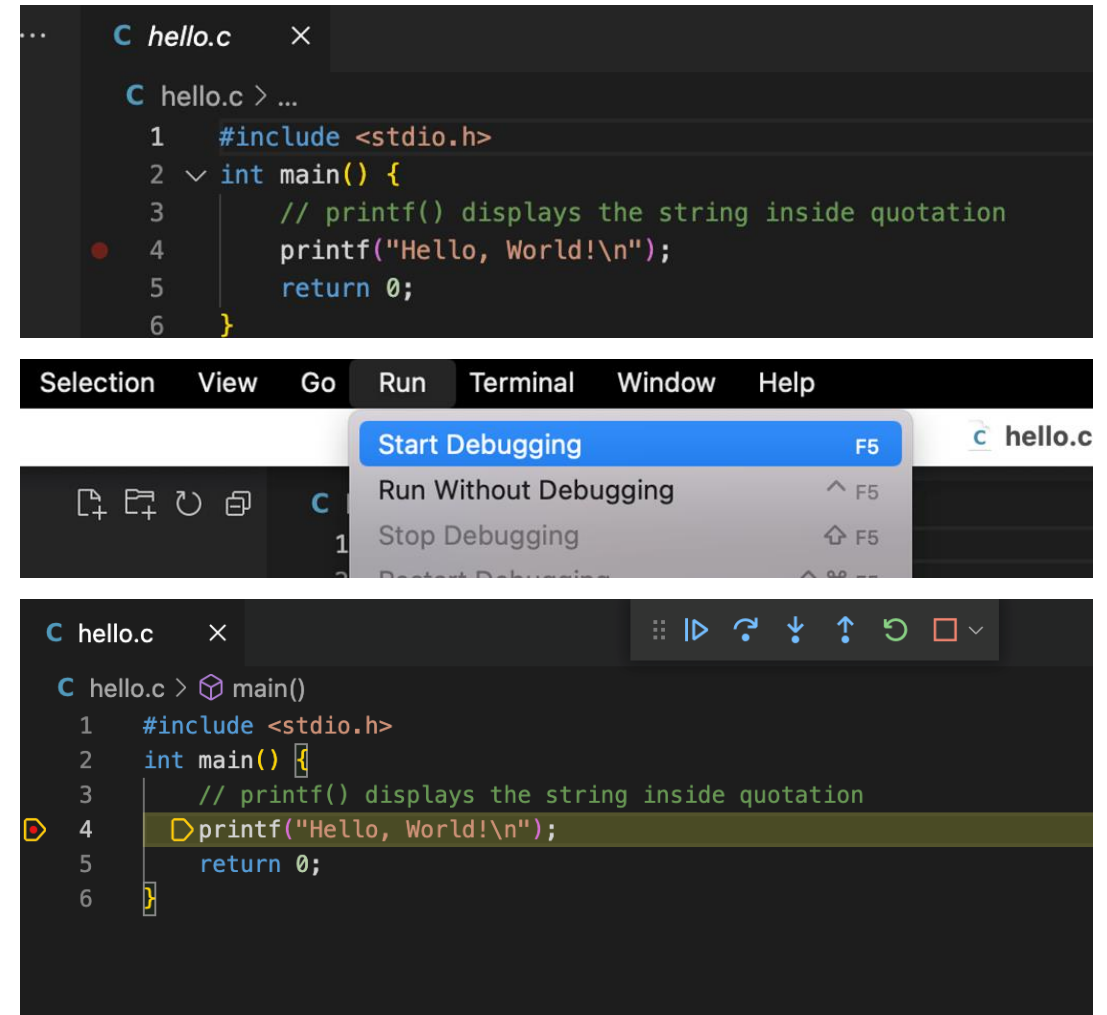
- now your code is ready to run and debug using “Run” in VS code.

To debug the code first click on the lines that you want your code stop on. you should see small red circles there after clicking.

Then from Run menu choose Start Debugging.

It should stop in the selected lines.

Then by using options at top you can navigate through your code and move inside your code



Compile and run your code using the terminal app and CSIL's C/C++ compiler

1. open a terminal and go to the directory that your file is in.

2. use cp to create another Hello World source code called helloCL.c:

cp hello.c helloCL.c

3. to create an executable file for file helloCL.c, and name the executable helloWorld, write this command in the terminal:

gcc helloCL.c -o helloWorld

- -o sets the name of the output file that GCC produces. You're using it when linking object files to make a complete program, and the default output filename for that is a.out. If you don't want your program to be called a.out, you use -o to specify a different name.

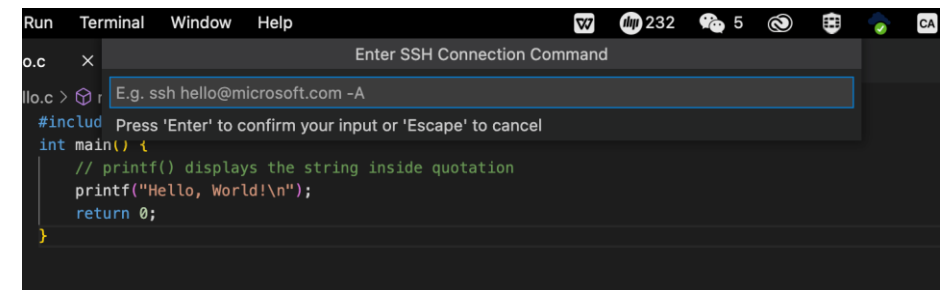
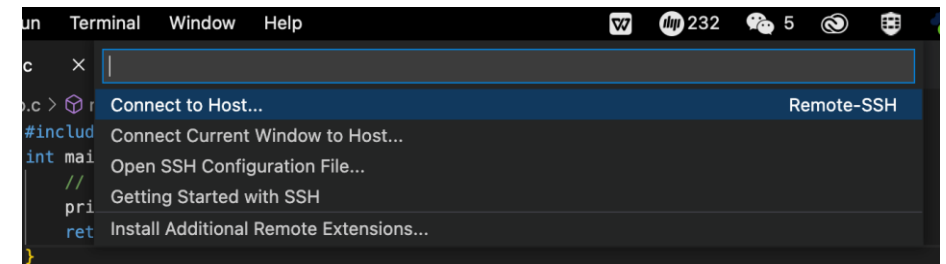
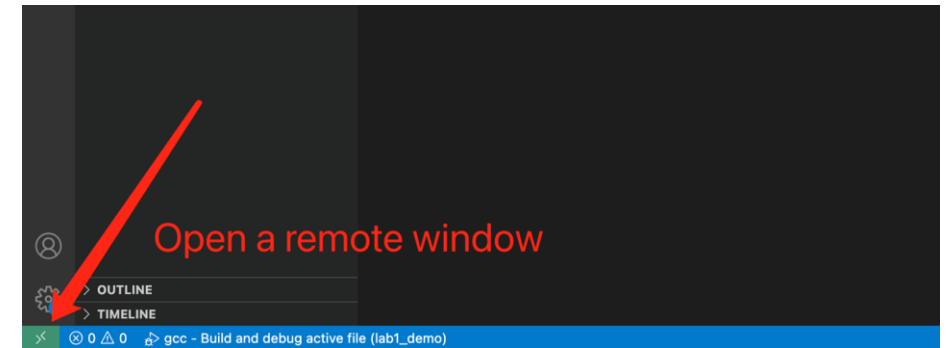
4. run the executable with this command in the terminal:
./helloWorld

```
@asb9838-1-a01:~$ cd sfuhome
@asb9838-1-a01:~/sfuhome$ ls
hello
@asb9838-1-a01:~/sfuhome$ cp hello.c helloCL.c
@asb9838-1-a01:~/sfuhome$ ls
hello  helloCL.c
@asb9838-1-a01:~/sfuhome$ gcc helloCL.c -o helloWorld
@asb9838-1-a01:~/sfuhome$ ls
hello.c  helloWorld
helloCL.c
@asb9838-1-a01:~/sfuhome$ ./helloWorld
Hello, World!
```

Compile and run your code using VS Code and its SSH tool

Using VS code (connect to **SFU VPN** from your local computer)

1. Open a remote window in VS code
2. Choose “Connect to Host”, and “add new SSH host”
3. connect to the host with:
`ssh -p24 your_sfu_computing_id@csil_host.csil.sfu.ca`
where,
your_sfu_computing_id: your SFU Computing ID
csil_host: one of the CSIL hosts listed in:
<https://www.sfu.ca/computing/about/support/covid-19-response--working-remotely/csil-linux-remote-access.html#csil-linux-systems>
4. Once connect to the host, you can open/move/edit/copy/etc.
your files the same way as on your own computer



Compile and run your code **using the terminal app after creating an SSH connection**

Using VS code (connect to **SFU VPN** from your local computer)

1. Open your terminal app

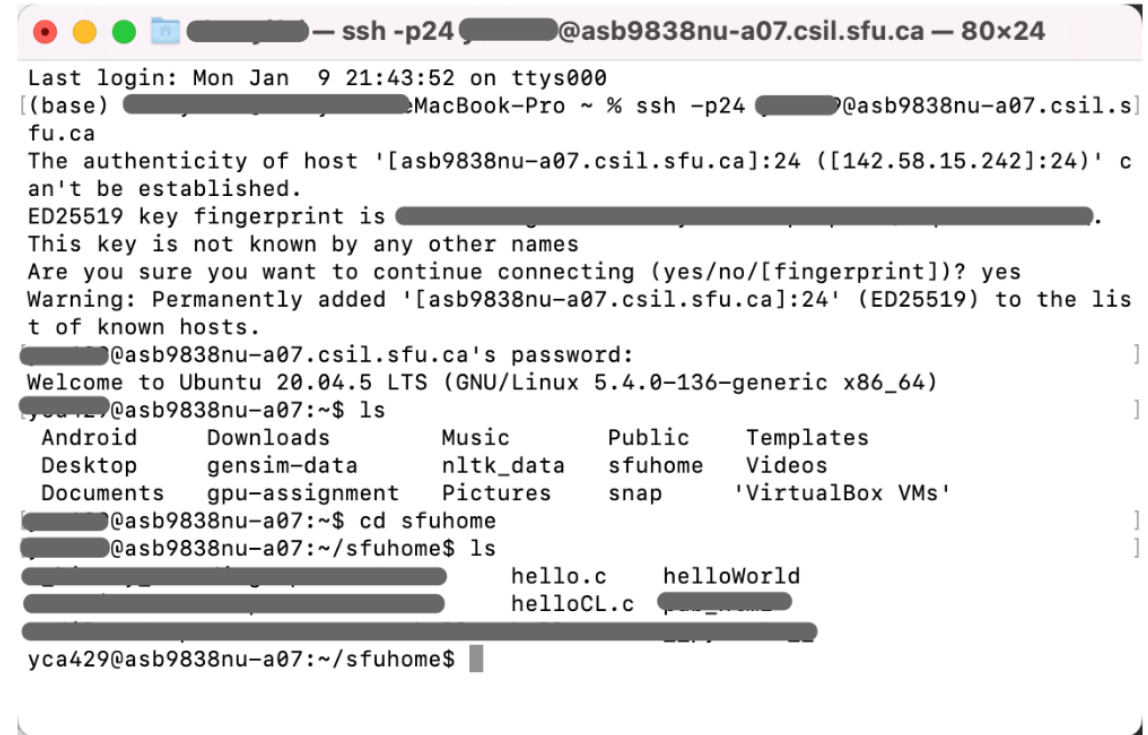
2. connect to the host with:

`ssh -p24 your_sfu_computing_id@csil_host.csil.sfu.ca`
where,

`your_sfu_computing_id`: your SFU Computing ID

`csil_host`: one of the CSIL hosts listed in:

<https://www.sfu.ca/computing/about/support/covid-19-response--working-remotely/csil-linux-remote-access.html#csil-linux-systems>



```
ssh -p24 [redacted]@asb9838nu-a07.csil.sfu.ca — 80x24
Last login: Mon Jan  9 21:43:52 on ttys000
[(base) [redacted] MacBook-Pro ~ % ssh -p24 [redacted]@asb9838nu-a07.csil.sfu.ca
The authenticity of host '[asb9838nu-a07.csil.sfu.ca]:24 ([142.58.15.242]:24)' can't be established.
ED25519 key fingerprint is [redacted].
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[asb9838nu-a07.csil.sfu.ca]:24' (ED25519) to the list of known hosts.
[redacted]@asb9838nu-a07.csil.sfu.ca's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.4.0-136-generic x86_64)
[redacted]@asb9838nu-a07:~$ ls
Android  Downloads  Music  Public  Templates
Desktop  gensim-data  nltk_data  sfuhome  Videos
Documents  gpu-assignment  Pictures  snap  'VirtualBox VMs'
[redacted]@asb9838nu-a07:~$ cd sfuhome
[redacted]@asb9838nu-a07:~/sfuhome$ ls
[redacted]  hello.c  helloWorld
[redacted]  helloCL.c  [redacted]
[redacted]
yca429@asb9838nu-a07:~/sfuhome$
```

The way we recommend for assignments...

Using CSIL's own gcc compiler in terminal, with VS Code connect to CSIL host:

