

Methods for developing C Programs and Associated Information (for COP 3502)

One Method

Develop in an alternate IDE (Code Blocks, VS Code, Dev C++ or other) and then transfer your file to Eustis and recompile and test on Eustis. Then, transfer the file back to your computer so you can upload it to Webcourses.

Another Method

Develop your program directly in Eustis, test it, and then transfer the file to your computer so that you can upload it to Webcourses.

Necessary Tools

This tutorial will NOT cover the use of an alternate IDE. It's expected that if students want to use an alternate IDE, they've used it before for COP 3223 or have learned how to use it on their own.

What this tutorial will cover is the following:

1. How to transfer files from your computer to Eustis and from Eustis to your computer.
2. Basic Unix commands, since Eustis uses Unix.
3. How to create a file on Eustis (using Emacs), edit it, and save it.
4. How to compile a .c file in Eustis.
5. How to run a .c file in Eustis.
6. How to pipe an input file into a program that reads from standard input.
7. How to pipe the output of your program from standard output to a file.
8. How to compare two files on Eustis and how to compare two on Windows.

Step -1: VPN

Follow the steps on Sean's Guide to Eustis to download the Cisco AnyConnect Secure Mobility Client. Install this and then open it and put in your NID and NID password. Once you are on VPN, you can use Eustis from home.

Step 0: Download MobaXTerm or use the Terminal on a Mac

These steps are in Sean's guide also. For windows, download MobaXTerm. On a Mac, you can open a terminal window to get to Eustis.

Item 1: Transferring Files to and From Eustis (SFTP)

In MobaXTerm, open a SFTP session. Open a connection to eustis.eecs.ucf.edu. Put in your NID and NID password. After you do this, you should see a nice graphical interface. On the left side is a file viewer of your local computer, on the right side is your Eustis directory. You can click and drag things from left to right or right to left, moving files between the two entities (your computer and your Eustis account).

Item 2: Editing Items on Your Eustis Account and Basic Unix Commands (SSH)

We are used to going interacting with our computer with a window based interface where we click on windows and double click on applications to get them started. Eustis is a unix system, where you type in commands on the command line. To log into your Eustis account, open a SSH session to eustis.eecs.ucf.edu (10.173.204.63). Note: The number in parentheses is the IP address of eustis. Directly type that in if "eustis.eecs.ucf.edu" isn't recognized.

In unix, you do all of these things with commands typed at a prompt. Here are some of the more common unix commands you may end up using when logged into Eustis:

`ls` - lists the files and folders in the current directory

`cd dirname` - changes the directory to go into the directory with the name `dirname`. It's like click on a folder one level deeper than where you currently are.

`cd ..` - this gets you out of a directory.

`cd ~/` - this gets you back to your home directory.

`more file` - this types out the contents of the file `file` without opening it

`diff -w file1 file2` - this is a utility program which compares to files, `file1` and `file2` and ignores whitespace (`-w` does this)

`emacs file` - this opens `file` in the editor `emacs`, a simple editor to use.

Item 3: Using Emacs

Once you are in an emacs editor, you can basically just type. But if you want to do some other things, here are the commands:

`Ctrl-v`: move forward one screen

`Alt-v`: move backwards one screen

`Ctrl-k`: delete from the cursor to the end of the line

`Ctrl-y`: pastes the last deleted text where the cursor is.

`Ctrl-/_`: undo

`Ctrl-x, Ctrl-s`: saves the file

`Ctrl-x, Ctrl-c`: exit emacs

Item 4: Compiling in Eustis

After you get out of emacs and save your .c file, just do:

```
>gcc -o program program.c
```

where program.c is your source file.

If there are no compilation errors, this will produce the executable file program.

Item 5: Running an executable in Eustis

If program is your executable, run it like this:

```
>./program
```

Item 6: Piping a File as Input to an executable in Eustis

The less than sign does file redirection. So, if you type some input into a file and save that file, let's say, "input.txt", and you write your program so that it reads using standard input, then we can run the program pretending that we typed exactly what was in input.txt into the keyboard as follows:

```
>./program < input.txt
```

Then, you should see the output of the program displayed on the screen.

Item 7: Piping the output of a program to a File in Eustis

The greater than sign takes the output to the screen and redirects it to a file of your choice. So, if you type:

```
>./program < input.txt > myoutput.txt
```

then the output of your program, running on the input in input.txt will be stored in myoutput.txt. If myoutput.txt existed before, then its old contents are wiped out before the program output is written to it.

Item 8: Comparing two Files in Eustis

If you want to see how similar two files, say myoutput.txt and program.out are, just do:

```
>diff -w myoutput.txt program.out
```

If nothing is printed out, then the files are identical except for maybe whitespace (the flag -w ignores whitespace).

Note: In Windows, I use WinDiff to compare to similar files and you can do all the command line stuff in Windows also, just don't do the ./ before the executable name.