

Summary 1

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In this week's lecture, we covered the basics of UNIX, how to access the supercomputer via ssh, and reviewed programming in C.

In order to interact with the supercomputer and run our code, we will have to use the terminal to log on and run our code. In order to do this, we will have to use **SSH**. SSH stands for **Secure Shell**, and it is a way of operating over a network securely. We will be using it to remotely access the supercomputer. While SSH-ing into the supercomputer, we will only have access to a terminal. This necessitates the use of a command-line based text editor. Some that will be at our disposal would be **Nano**, **VI**, **VIM**, and **Emacs**. Out of these four, Nano is the simplest to learn and easiest for beginners, due to its limited functionality, as well as the fact that most of its keyboard shortcuts are displayed on the front. Both Vim and Emacs are considerably harder but have much more functionality due to their many macros and other features. For example, in Emacs, you are able to run code you write inside of emacs, as well as things like have multiple files open at once.

Most of the code we will be writing will be in the language C. C is a very old language, with traditional C starting in 1978. The next version of C, C89 (also called ANSI C) is considered to be the default version of C that will work on almost all compilers and has a good feature set. ANSI C added a lot of features to C, including new keywords like `const`, `signed`, and `volatile`. It also added type checking and a real standard library. By the standard of modern programming languages, C is harder to use but allows for greater control of memory management. With C, we are able to allocate memory using either `malloc` or `calloc` and reallocate memory with `realloc`. However, when we allocate memory, it is important to free, otherwise, it will cause a memory leak. C also has quite a few idiocracies. For example, it does not support classes. Instead of classes, you can use structs, which are similar to classes, but have the caveat that they don't contain functions.