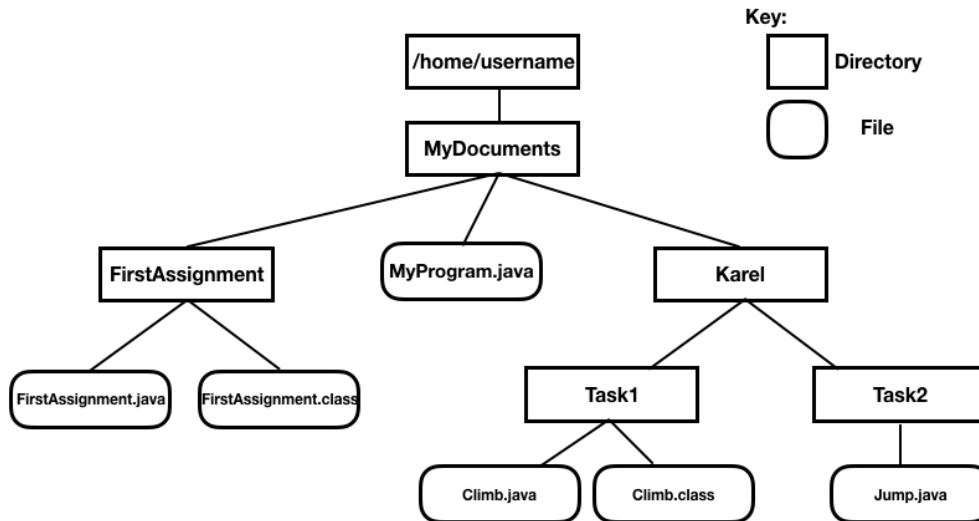


The lab computers use a version of the LINUX operating system. LINUX is similar, in many ways, to the original UNIX operating system developed in the 1970's. The Terminal application runs a version of the **bash** command line.

**UNIX File System**

UNIX/LINUX has a file system structure similar to Windows and Mac OS. It looks like a tree structure (see figure below). UNIX calls a folder a **directory**. On our lab computers, a terminal window will automatically put you into the directory **"/home/username/MyDocuments"**. "username" is your login name.



Create file names and directory names only with alphanumeric characters (A-Z and 0-9) to avoid confusion. The dot (".") and underline ("\_") characters are also allowed. The suffix of a file name, preceded by a dot ".", denotes the file type. For example, the suffix ".java" means the file contains Java source and the suffix ".class" means the file contains Java bytecode.

Important directories:

- /home/username/MyDocuments** starting directory
- ~/MyDocuments** shorthand for "/home/username/MyDocuments"
- .** current directory
- ..** parent directory

**List Files - ls**

A new terminal window starts in the directory */home/username/MyDocuments*, the current directory. To list the files in the current directory use "ls". Say you want to list what is inside the directory "FirstAssignment" in the diagram above. Type "ls FirstAssignment" and it will list the two file names. If you want to see the files inside the "Task1" directory shown above, type "ls Karel/Task1".

Here are some helpful "flags" (options) that will give you more information.

- F** list file names, and list directories preceded by "/"
- s** list files and directory names with file sizes in KB
- l** list files and directory names with lots of information: protections, owner, group, file size, modify date, etc.

**Example:** `ls -l FirstAssignment`

**Other Commands**

<b>cd</b> directoryname	change directory; makes <i>directoryname</i> the current directory
<b>cp</b> oldfile newfile	copy file
<b>du -s</b> <filename> <directoryname>	disk usage (filename and directoryname are optional)
<b>mkdir</b> directory	make directory
<b>mv</b> oldfile newfile	change file name
<b>mv</b> file directory	move file into directory
<b>rm</b> file	remove file (delete)
<b>rmdir</b> directory	remove directory (delete), precondition: directory must be empty

**Sending Files Through Email**

UNIX can compress files and directories into one file that can be sent over email. The compression program is called **zip**. The advantage of using **zip** is being able to send a whole directory of files in one attached email file. Both the files and the directory structure are transported verbatim.

Another powerful use of **zip** is to free up space in your lab computer directory. You only get 25MB of disk for the year. By the second semester, students start running out of space. You can use **zip** to compress your directories and files into one smaller file; therefore, you can remove the space-wasting files and free up space for future work.

Create an archived and compressed zip file:

```
zip -r archiveFileName.zip directoryName
```

Extract the directory and files from a compressed file:

```
unzip archiveFileName.zip
```