

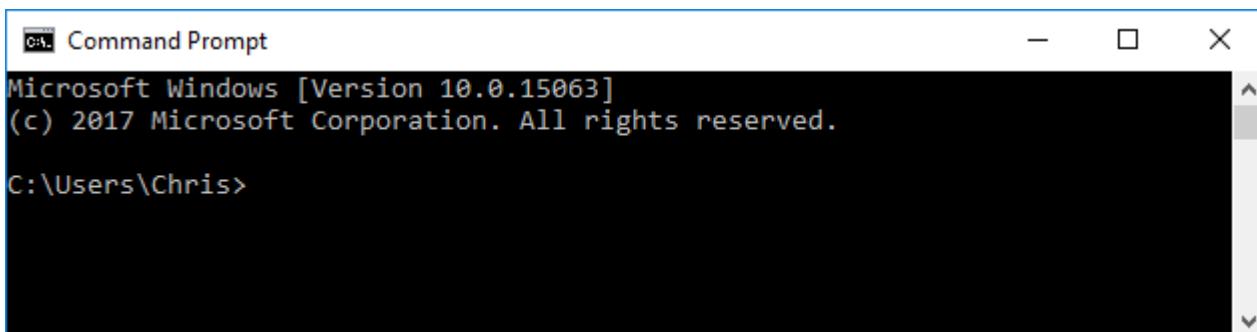
Getting Started with Command Prompts

Updated December, 2017

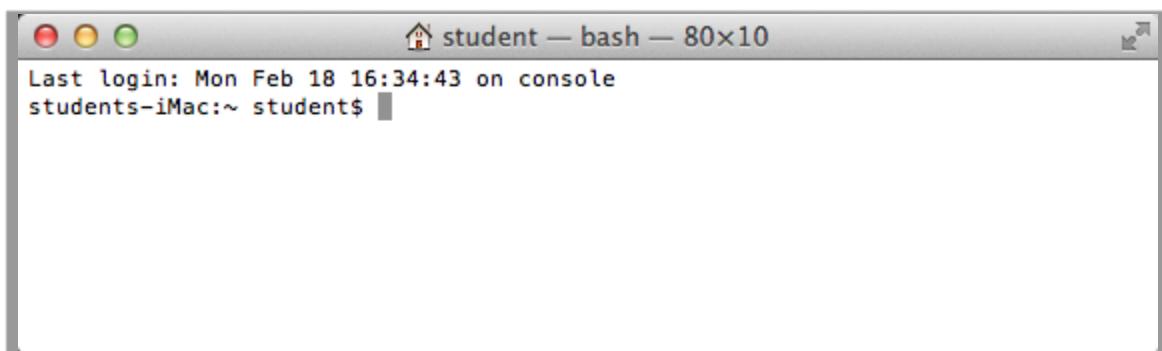
Some courses such as **Java Programming** will ask the student to perform tasks from a command prompt (Windows) or Terminal window (Mac OS). Many students have never had an opportunity to work with command prompts before, so this document will introduce the concepts necessary to be successful in the course activities.

What is a Command Prompt?

Before graphical operating systems like Microsoft Windows and Apple Mac OS, users interacted with computers through a command prompt. Command prompts are text-based windows where users can type commands and receive text-based output. You don't have any familiar mouse input options or graphical buttons, labels, or other widgets common in graphical forms.



Windows Command Prompt

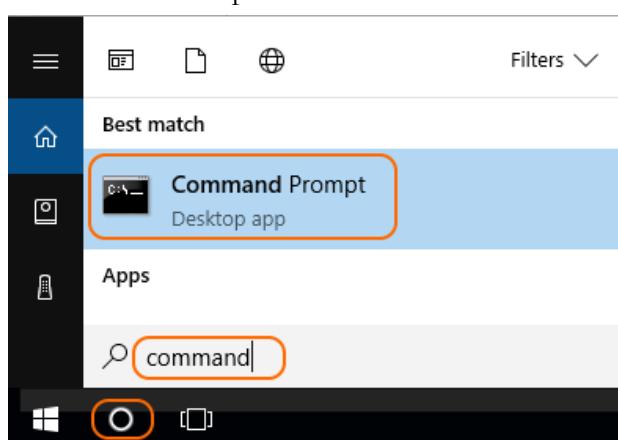
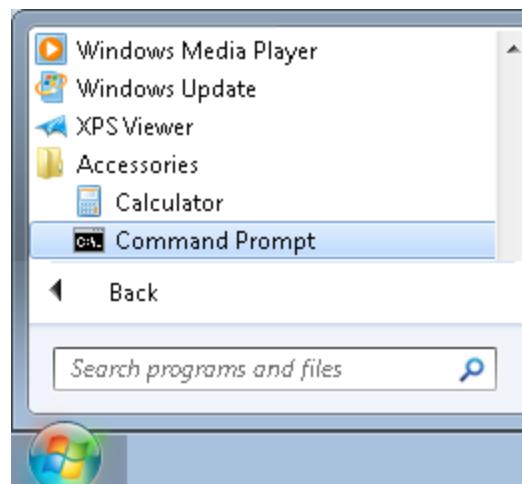


Mac OS Terminal Prompt

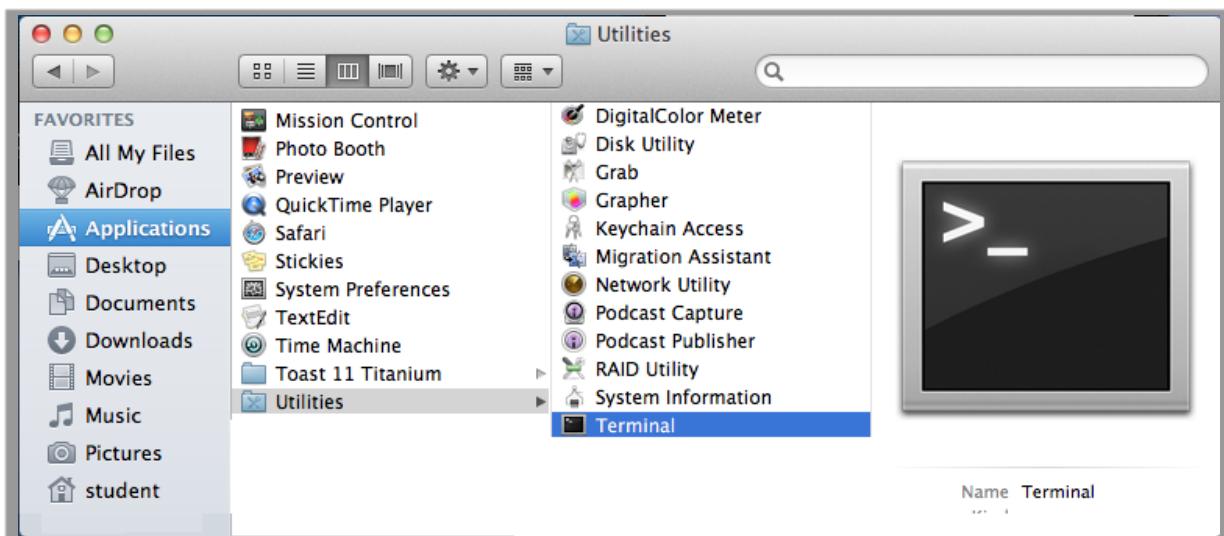
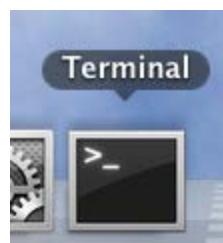
How do I Start a Command Prompt?

On Windows computers you can start a command prompt from the Start Menu on Windows 7. Select “Programs” or “Programs and Features” and then scroll down to the “Accessories” folder. Inside the Accessories folder you will find the “Command Prompt” icon. Click that icon to launch your Command Prompt.

Windows 8 and 10 users can search for the Command Prompt by typing “command” in the search box and selecting the “Command Prompt” result.

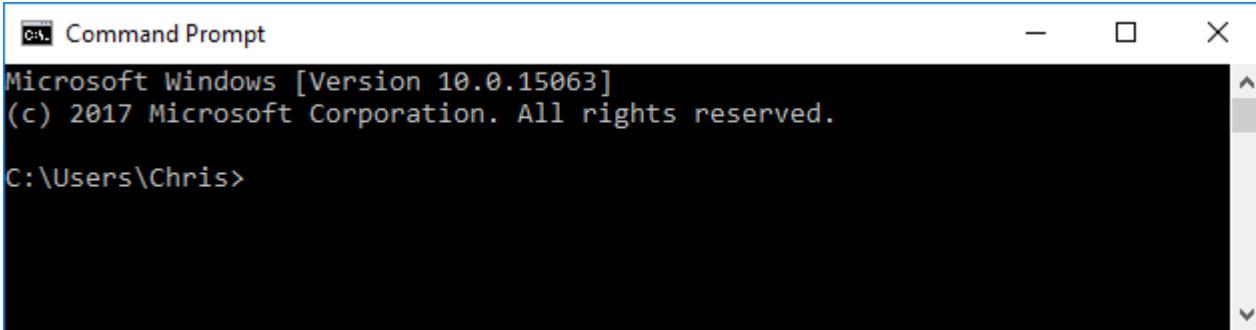


On Mac computers, you may have the terminal docked near the bottom of your screen as shown to the left. If not you can start it from your Finder application by navigating to your “Applications/Utilities” folder and clicking on the “Terminal” icon.



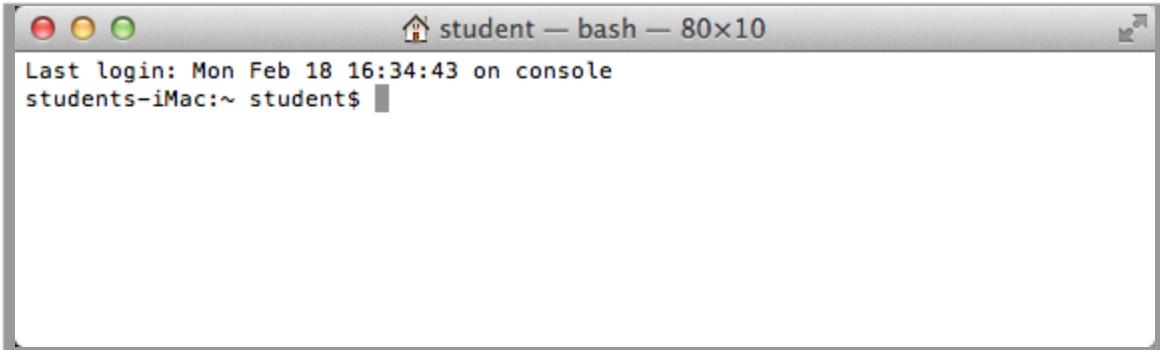
Command Prompts Focus on a Directory

Your computer hard drive contains a number of directories and sub-folders in a hierarchical arrangement. Your command prompt will always be “focused” on one particular directory at a time, and that directory is typically reflected in the text prompt. In the example below the Windows command prompt is focused on the “C:\Users\Chris” directory. Commands that you type into the Windows command prompt will appear after the right angle bracket “>”.



A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows the following text:
Microsoft Windows [Version 10.0.15063]
(c) 2017 Microsoft Corporation. All rights reserved.
C:\Users\Chris>

On Mac OS your directories are also displayed on the command line. In this example we are in the “student” account home directory, represented by a tilde character (~).



A screenshot of a Mac OS Terminal window titled "student — bash — 80x10". The window shows the following text:
Last login: Mon Feb 18 16:34:43 on console
students-iMac:~ student\$

Changing Directories

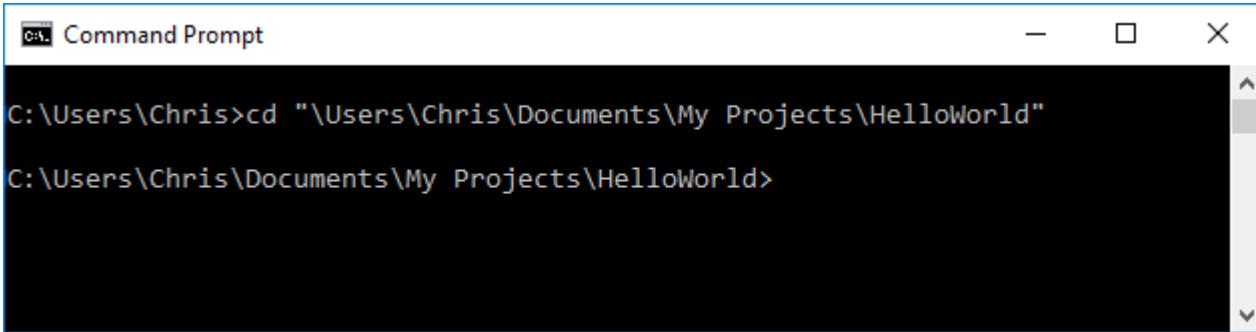
Whenever you run a command (such as compiling or running a Java program), that command will execute in the context of your **current directory**. So you will want to change your current directory to focus the command prompt on the folder that contains your source files. To change the directory, use the “cd” command. That means from the command prompt you type “cd” followed by the target directory:

cd “<target directory>”

Directories are names separated by backslashes (Windows) or forward slashes (Mac OS). The parent or higher-level directory is to the left and the child or lower-level directory names are to the right.

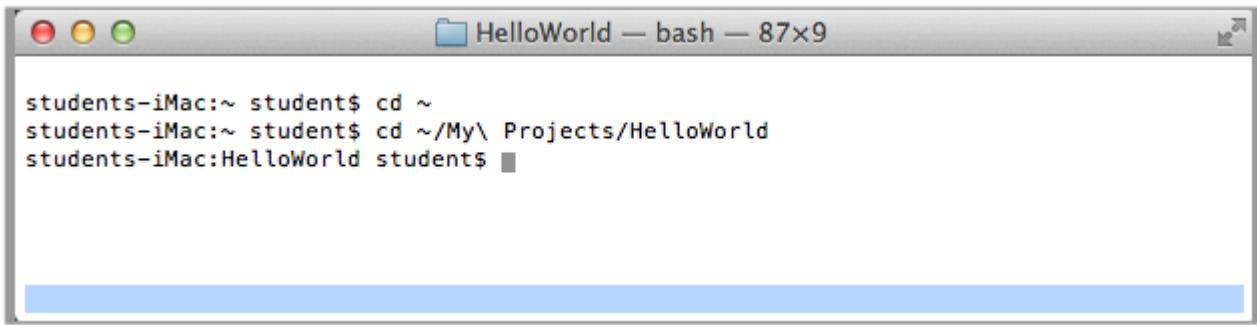
- “My Projects\HelloWorld” (Windows)
- “My Projects/HelloWorld” (Mac OS)

In this Windows example we use the “cd” command to change to a new directory.



A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows the command "cd \"\Users\Chris\Documents\My Projects\HelloWorld\"". After the command is run, the prompt changes to "C:\Users\Chris\Documents\My Projects\HelloWorld>".

We can use the same “cd” command on Mac OS. Depending on your version of Mac OS, you can use the same double-quotes around the entire path, OR you could add a backslash (\) in front of every space within the path like this:



A screenshot of a Mac Terminal window titled "HelloWorld — bash — 87x9". The window shows the command "cd ~" followed by "cd ~/My\ Projects/HelloWorld". After the command is run, the prompt changes to "HelloWorld student\$".

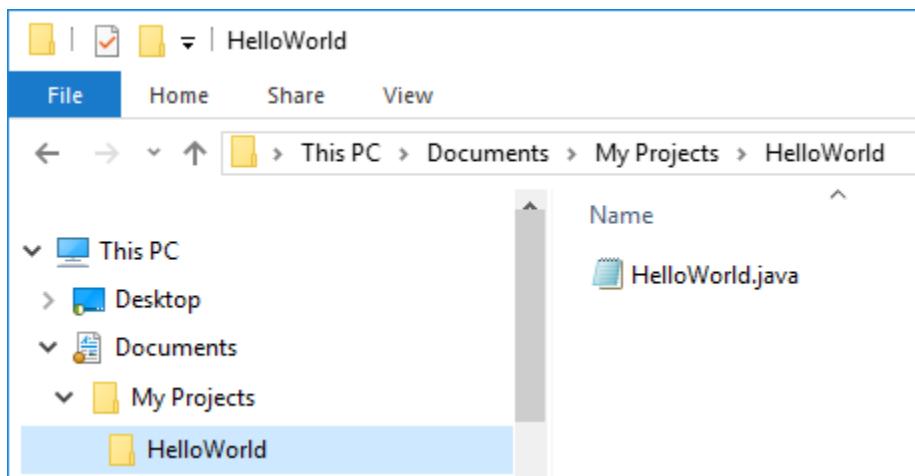
The Mac Terminal will only show the last (leaf) subdirectory and not your full path. Above you can see just the “HelloWorld” part of the full path.

Notice how the command prompt changes to reflect the new directory that has the focus. If you attempt to change to an invalid directory you will get an error message! An error message almost certainly means you have made one of these common mistakes:

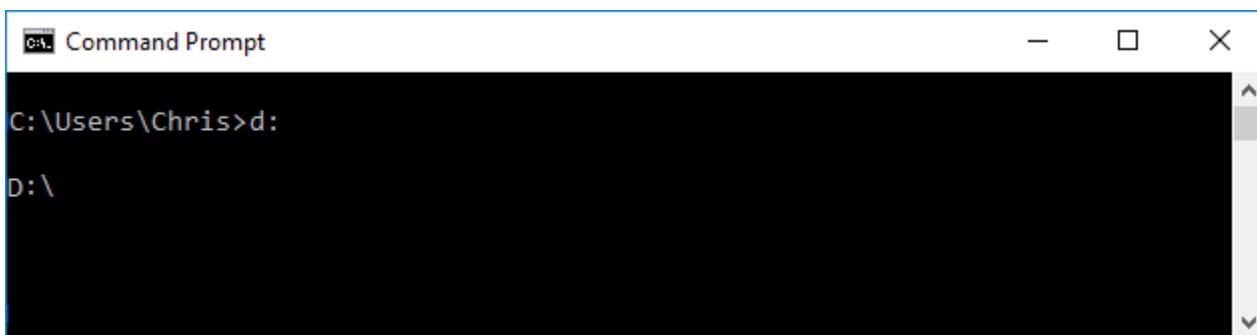
- Spelling a directory name incorrectly (Spaces are important! Mac OS is also case sensitive.)
- Failing to use the correct forward slash (/) or backslash (\) for your operating system.

- Forgetting to use double-quotes on Windows to surround your full directory name
- Forgetting to put a backslash in front of spaces within a path on Mac OS
- Attempting to change to a directory that does not actually exist

If you have not created the “HelloWorld” directory underneath “My Projects” in the example above, then you will not be able to “cd” to that directory and you will receive an error message. If you are confused about what directories are on your hard drive, you can always use Windows File Explorer or Mac OS Finder to review your directory structure and create directories.

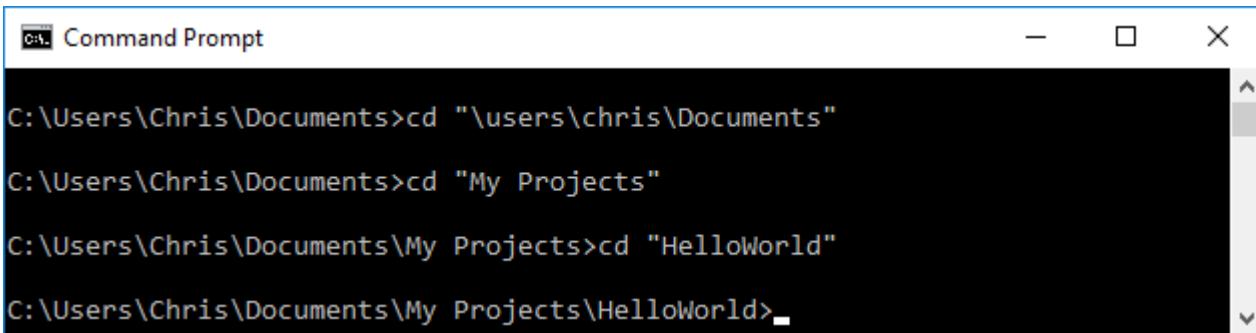


Some Windows computers may have more than one hard drive identified by different letters like C or D. To change your command prompt to focus on a different drive, just type the drive letter followed by a colon. From there you can use the “cd” command to access other directories on that different drive.



Absolute vs. Relative Paths

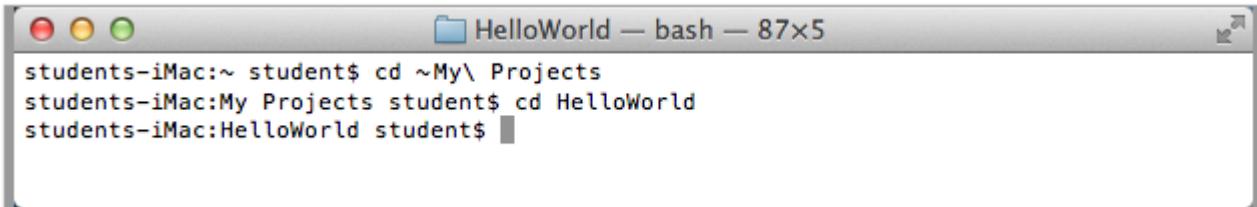
When you run the “cd” command to change to a different directory, you can use an **absolute path** containing the **entire directory structure** at once. If your target directory starts with a slash, that indicates an **absolute** path that will begin from the **root of that hard drive**. If you **omit the leading slash**, that means you want to change to a directory **relative** to your **current location**. In this example we begin with an absolute step to get to the example user’s “Documents” directory and then take smaller steps to reach “HelloWorld”.



A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows a series of "cd" commands being run in sequence:

```
C:\Users\Chris\Documents>cd "\users\chris\Documents"
C:\Users\Chris\Documents>cd "My Projects"
C:\Users\Chris\Documents\My Projects>cd "HelloWorld"
C:\Users\Chris\Documents\My Projects\HelloWorld>
```

Mac OS works the same way, but you also have a special character (~) that represents your user account’s home directory.

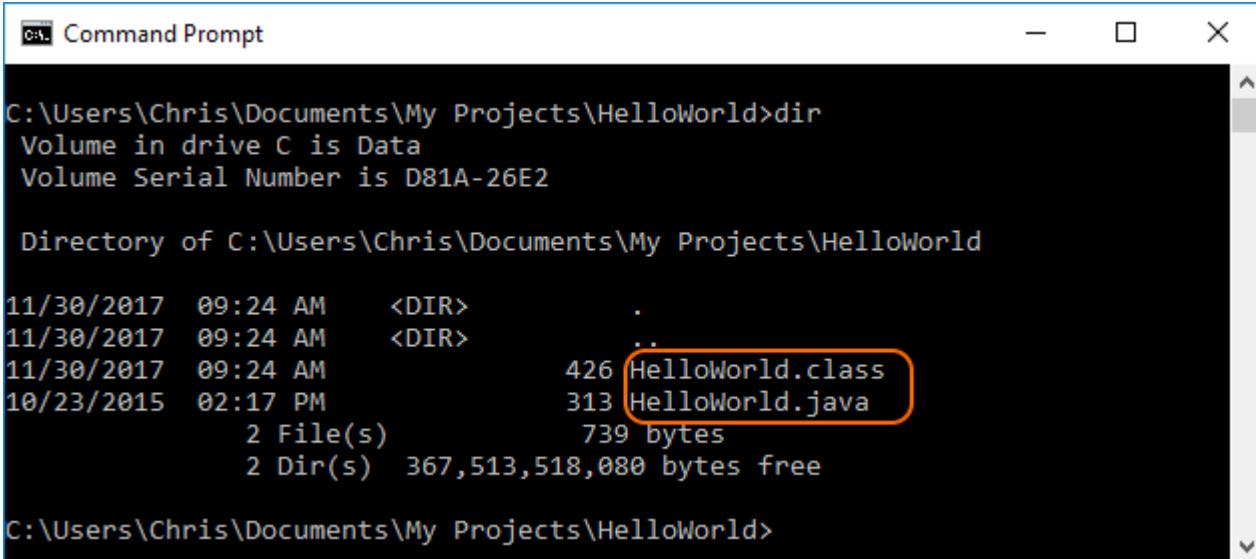


A screenshot of a Mac OS Terminal window titled "HelloWorld — bash — 87x5". The window shows a series of "cd" commands being run in sequence:

```
students-iMac:~ student$ cd ~My\ Projects
students-iMac:My Projects student$ cd HelloWorld
students-iMac:HelloWorld student$
```

Getting Directory Listings

Students may want to examine the contents of the current directory in order to confirm that the right files are in the right place. On Windows type “dir” to get a directory listing.



A screenshot of a Windows Command Prompt window titled "Command Prompt". The command typed is "dir". The output shows the directory structure of "C:\Users\Chris\Documents\My Projects\HelloWorld". It lists two files: "HelloWorld.class" and "HelloWorld.java". Both files have a size of 426 bytes. The file "HelloWorld.java" is dated 10/23/2015 at 02:17 PM, while "HelloWorld.class" is dated 11/30/2017 at 09:24 AM. The total free space is 367,513,518,080 bytes.

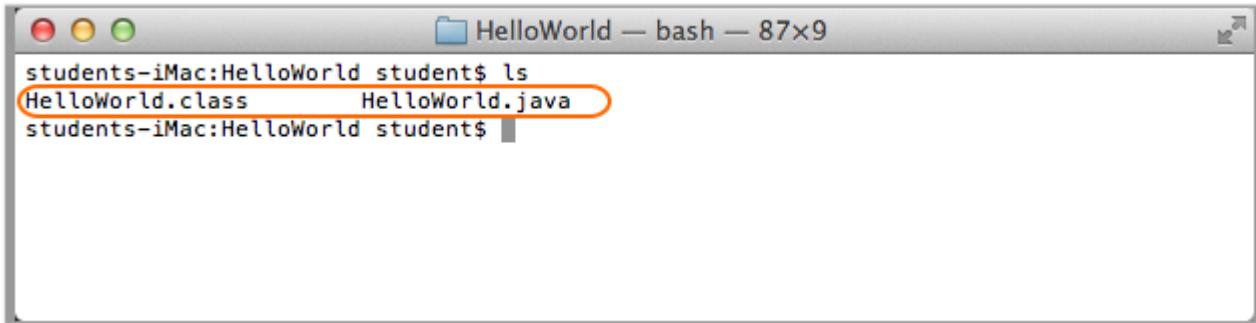
```
C:\Users\Chris\Documents\My Projects\HelloWorld>dir
Volume in drive C is Data
Volume Serial Number is D81A-26E2

Directory of C:\Users\Chris\Documents\My Projects\HelloWorld

11/30/2017  09:24 AM    <DIR>      .
11/30/2017  09:24 AM    <DIR>      ..
11/30/2017  09:24 AM                426 HelloWorld.class
10/23/2015  02:17 PM                313 HelloWorld.java
                           2 File(s)       739 bytes
                           2 Dir(s)   367,513,518,080 bytes free

C:\Users\Chris\Documents\My Projects\HelloWorld>
```

On Mac OS, type “ls” to get a directory listing.



A screenshot of a Mac OS Terminal window titled "HelloWorld — bash — 87x9". The command typed is "ls". The output shows the directory listing of "HelloWorld". It lists two files: "HelloWorld.class" and "HelloWorld.java". Both files have a size of 426 bytes. The file "HelloWorld.java" is dated 10/23/2015 at 02:17 PM, while "HelloWorld.class" is dated 11/30/2017 at 09:24 AM.

```
students-iMac:HelloWorld student$ ls
HelloWorld.class      HelloWorld.java
students-iMac:HelloWorld student$
```

You can also use **Windows File Explorer** or **Mac OS Finder** to visually inspect the contents of your directories!

Attempting to build and run Java programs against files require you to be in the right directory containing the correct files. If you receive error messages while following the documented activity steps, that means you are either focused in the wrong directory, or have not stored the correct files in that directory.