

CISC 3115 TY2

Programming Environment

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Outline

- Get around in Operating Systems
 - Unix-like: Unix, Linux, OS X
 - Windows
- Terminal and command line
- JRE and JDK
- Authoring Java programs
- Compiling and running Java programs

Question?

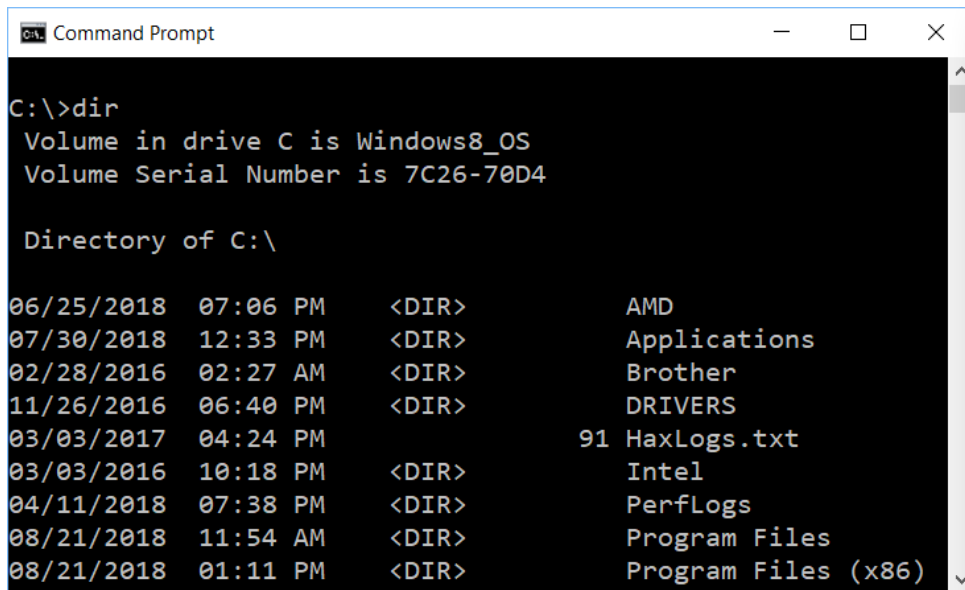
- Do you have a computer that you can use for the class?
- It is necessary to have a computer for this class. What if you don't?

Operating Systems

- Do you know the answers to the questions:
 - Where are my files?
 - What is a folder or a directory?
 - How do I install an computer application?
 - How do I open a terminal window?
 - How do I copy/delete/rename a file, or a folder/directory. How about several files or folders/directories?
- To learn programming, it is necessary to be proficient in using your computer. Minimally, you need to know the answers to the questions like these.
 - If not yet, no sweat, we will get there this semester.

Terminal and Command Line

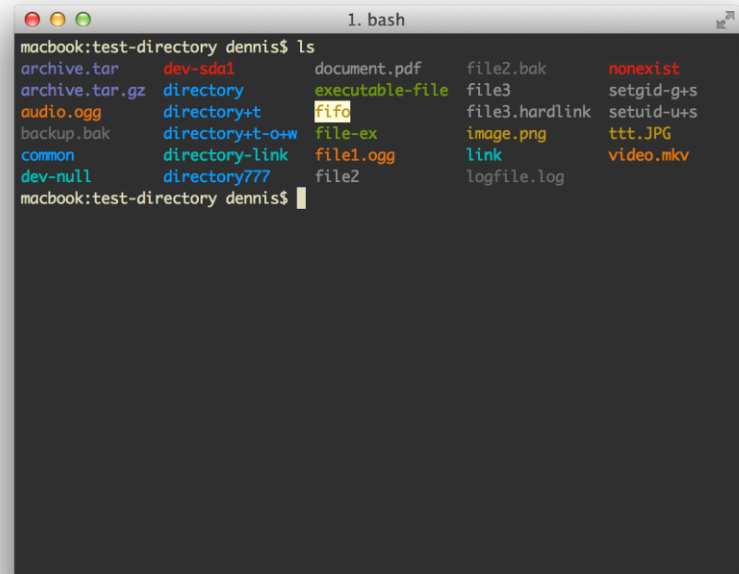
- Use a Command Line
- Why?



```
C:\>dir
Volume in drive C is Windows8_OS
Volume Serial Number is 7C26-70D4

Directory of C:\

06/25/2018  07:06 PM    <DIR>          AMD
07/30/2018  12:33 PM    <DIR>          Applications
02/28/2016  02:27 AM    <DIR>          Brother
11/26/2016  06:40 PM    <DIR>          DRIVERS
03/03/2017  04:24 PM                91 HaxLogs.txt
03/03/2016  10:18 PM    <DIR>          Intel
04/11/2018  07:38 PM    <DIR>          PerfLogs
08/21/2018  11:54 AM    <DIR>          Program Files
08/21/2018  01:11 PM    <DIR>          Program Files (x86)
```



```
macbook:test-directory dennis$ ls
archive.tar  dev-sda1  document.pdf  file2.bak  nonexistent
archive.tar.gz  directory  executable-file  file3      setgid-g+s
audio.ogg    directory+t  fifo          file3.hardlink  setuid-u+s
backup.bak   directory+t-ow  file-ex      image.png  ttt.JPG
common       directory-link  file1.ogg    link        video.mkv
dev-null     directory777    file2        logfile.log
macbook:test-directory dennis$
```

Common Tasks on Command Line

Windows

- Display working directory: `cd`
- Display content of a directory: `dir`
- Change directory: `cd directory_to_go`
- Make directory: `mkdir dir_to_make`
- Move files: `move this_file to_dir`
- Delete file: `del file_to_delete`
- Delete directory: `rmdir dir_to_delete`

Unix-like

- Display working directory: `pwd`
- Display content of a directory: `ls`
- Change directory: `cd directory_to_go`
- Make directory: `mkdir dir_to_make`
- Move files: `move this_file to_dir`
- Delete file: `rm file_to_delete`
- Delete directory: `rmdir dir_to_delete`

JRE and JDK

- JRE: Java Runtime Environment
 - Required to run a Java program
- JDK: Java Development Kit
 - Required to author a Java program
 - Compile and run Java programs
- Have you had JDK installed/set up in your system?

Oracle JDK vs Open JDK

- Java
 - A specification. There are more than one implementations and packaging.
 - <https://docs.oracle.com/javase/specs/index.html>
- Oracle JDK
 - <https://www.oracle.com/java/technologies/javase-downloads.html>
- Open JDK
 - <https://openjdk.java.net/>
- But, wait!!!

Java Version

- For this class, Java 11 or 17 LTS is required.
 - <https://www.oracle.com/java/technologies/javase/jdk11-archive-downloads.html>
 - <https://www.oracle.com/java/technologies/downloads/#java17>

Verify JRE is Present

- On Command Line
 - `java -version`

```
Command Prompt
C:\>java -version
java version "1.8.0_261"
Java(TM) SE Runtime Environment (build 1.8.0_261-b12)
Java HotSpot(TM) 64-Bit Server VM (build 25.261-b12, mixed mode)
C:\>
```



```
Command Prompt
C:\>jave -version
'jave' is not recognized as an internal or external command,
operable program or batch file.
C:\>
```



Verify JDK is Present

- On Command Line (screen shots are dated)
 - javac -version

```
Command Prompt
C:\>javac -version
javac 1.8.0_251
C:\>_
```



```
Command Prompt
C:\>javac -version
'javac' is not recognized as an internal or external command,
operable program or batch file.
C:\>_
```



Verify Versions of JVM and Java Compiler

- On command line (screen shots are dated)

```
Command Prompt
C:\Users\hui>java -version
java version "1.8.0_301"
Java(TM) SE Runtime Environment (build 1.8.0_301-b09)
Java HotSpot(TM) 64-Bit Server VM (build 25.301-b09, mixed mode)

C:\Users\hui>javac -version
javac 14.0.2

C:\Users\hui>
```



```
Command Prompt
C:\Applications\Java>java -version
openjdk version "16.0.2" 2021-07-20
OpenJDK Runtime Environment (build 16.0.2+7-67)
OpenJDK 64-Bit Server VM (build 16.0.2+7-67, mixed mode, sharing)

C:\Applications\Java>javac -version
javac 16.0.2

C:\Applications\Java>
```



Trouble with JDK?

- “I have installed JDK, but still I got this!”

```
Command Prompt
C:\>javac -version
'javac' is not recognized as an internal or external command,
operable program or batch file.
C:\>_
```



- You need to set up the search path for JDK's executables (such as, javac)
 - System specific, but we will do it via the user profile of “Git Bash”

In-Class Exercise

- Let's complete the following tasks
 - Open a terminal
 - Show working directory
 - Display content in the working directory
 - Switch to a different directory
 - Create a directory
 - Delete the directory
 - Verify if JRE is present
 - Verify if JDK is present (if inaccessible on command line, it is OK for this exercise; we shall address this in a little while)
 - Write a short manual about the steps in the journal in directory C0826

In-Class Exercise

1. Create a folder (i.e., directory) , such as “CISC3115” somewhere on your computer
2. In the “CISC3115” directory, create a subfolder (i.e., subdirectory), e.g., for today, create the “C0829” folder.
3. Go to the directory (“cd C0829”)
4. Create a batch file (on Windows systems)/shell script (on UNIX systems)
 - Windows

```
echo java -version > checkjava.cmd
echo javac -version > checkjavac.cmd
```
 - UNIX

```
echo “java -version” > checkjava.sh
echo “javac -version” > checkjavac.sh
```

Questions?

- Do you have any questions?
- Is there any tasks you wish to do, but not introduced in the class?