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JAVA BOOTCAMP

GIT & GITHUB

GOALS FOR THIS UNIT

1. Intro to the command line
2. Version Control
3. Git & Github
4. Hands-on exercises

INTRO TO THE COMMAND LINE

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GETTING STARTED

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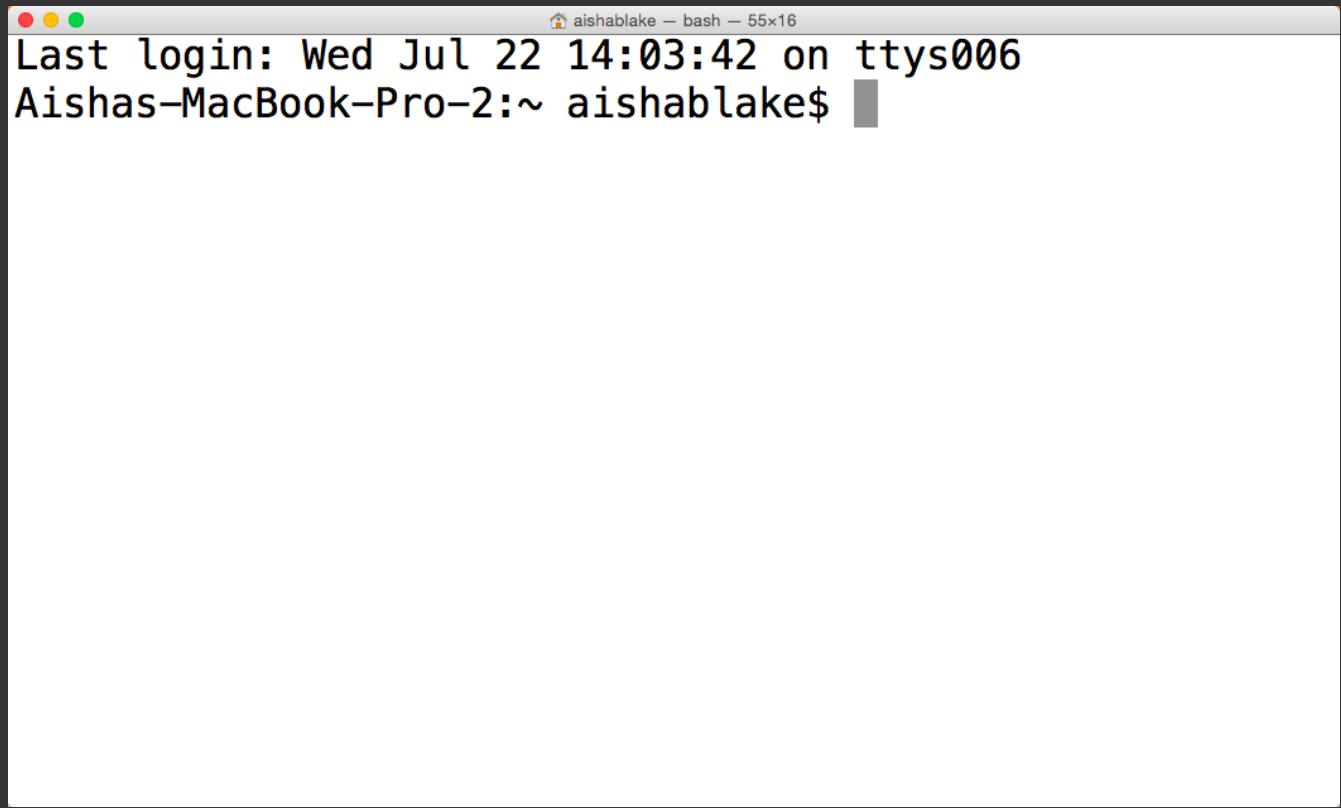
WHICH OS?

Mac users: Open up Terminal

Windows users: Download and install [Git Bash](#)

If you're on a PC, you can use the command line tool that came with your computer, but know that certain commands will be different.

TERMINAL PROMPT



The image shows a Mac OS X terminal window titled "aishablake - bash - 55x16". The window contains the following text:
Last login: Wed Jul 22 14:03:42 on ttys006
Aishas-MacBook-Pro-2:~ aishablake\$

Many command line prompts will end with a dollar sign . This is your signal that it's okay to type a new command.

TERMINAL CHEAT SHEET

There are lots of things we can do with the command line. Once you get used to it, doing things this way can be a lot faster than switching between the mouse and the keyboard, pointing and clicking.

We're going to go over a few very important commands that will be particularly useful to us, but you should feel free to refer back to this [cheat sheet](#) as often as necessary.

Windows users can use this [cheat sheet](#).

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NAVIGATION

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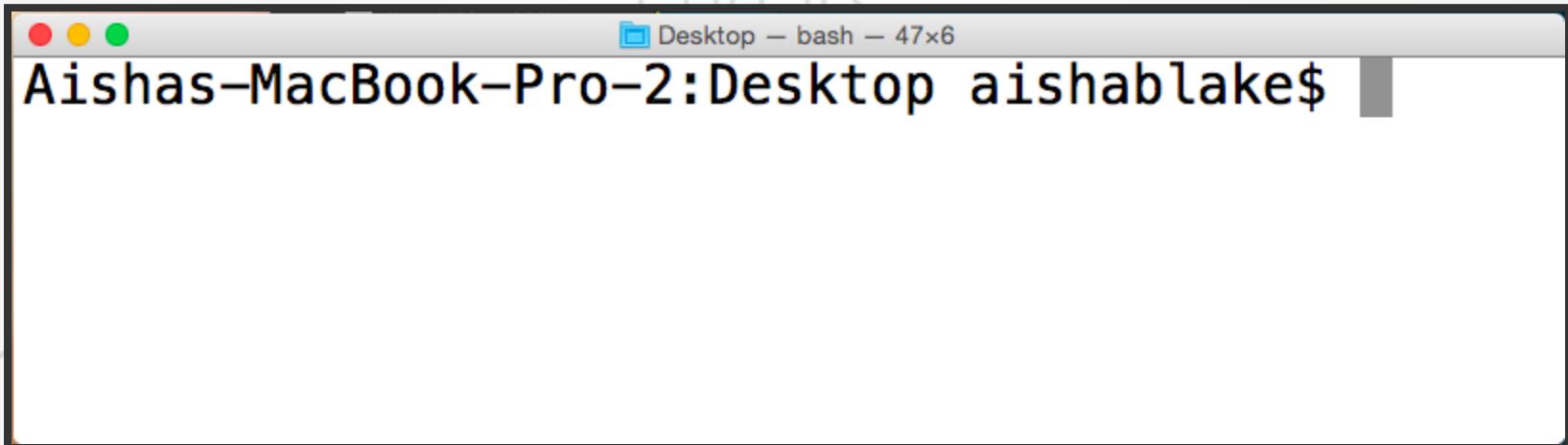
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CHANGE DIRECTORY

The `cd` command allows us to define a path to the directory we wish to navigate to. Executing this command will change where we are in the folder structure. This change should be reflected in our command prompt.

```
$ cd Desktop
```

GETTING ORIENTED



The terminal prompt will give us some indication as to where we are within the folder structure.

CURRENT DIRECTORY

A single period (.) is used to indicate the current directory.

```
$ touch ./example.txt
```

PARENT DIRECTORY

Two periods (..) indicates the parent directory. This is like moving one level "up" within the folder structure.

```
$ cd ../../another-example.txt
```



ROOT DIRECTORY

A tilde (~) is used to indicate the root directory. We're essentially saying "go back to the beginning and start from scratch". On a Mac, this is your Home.

```
$ cd ~
```



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INFORMATION

PRESENT WORKING DIRECTORY

The `pwd` command returns a path showing exactly where we are within the folder structure.

```
$ pwd
```

On a Windows machine? Try using `cd`.

YOU ARE HERE

```
aishablake ~ aishablake$ pwd  
/Users/aishablake  
aishablake ~ aishablake$
```



LIST

Use `ls` to see the contents of the current directory.

```
$ ls
```

On a Windows machine? Try using `dir`.

TABLE OF CONTENTS

```
Aishas-MacBook-Pro-2:Learn aishablake$ ls
Apprend           Conf            Google          Treehouse
CodeSchool        GDI             LevelUpTuts   Udacity
Aishas-MacBook-Pro-2:Learn aishablake$
```

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HELP

When you're not sure what your options are, typing
help will list all possible commands.

```
$ help
```

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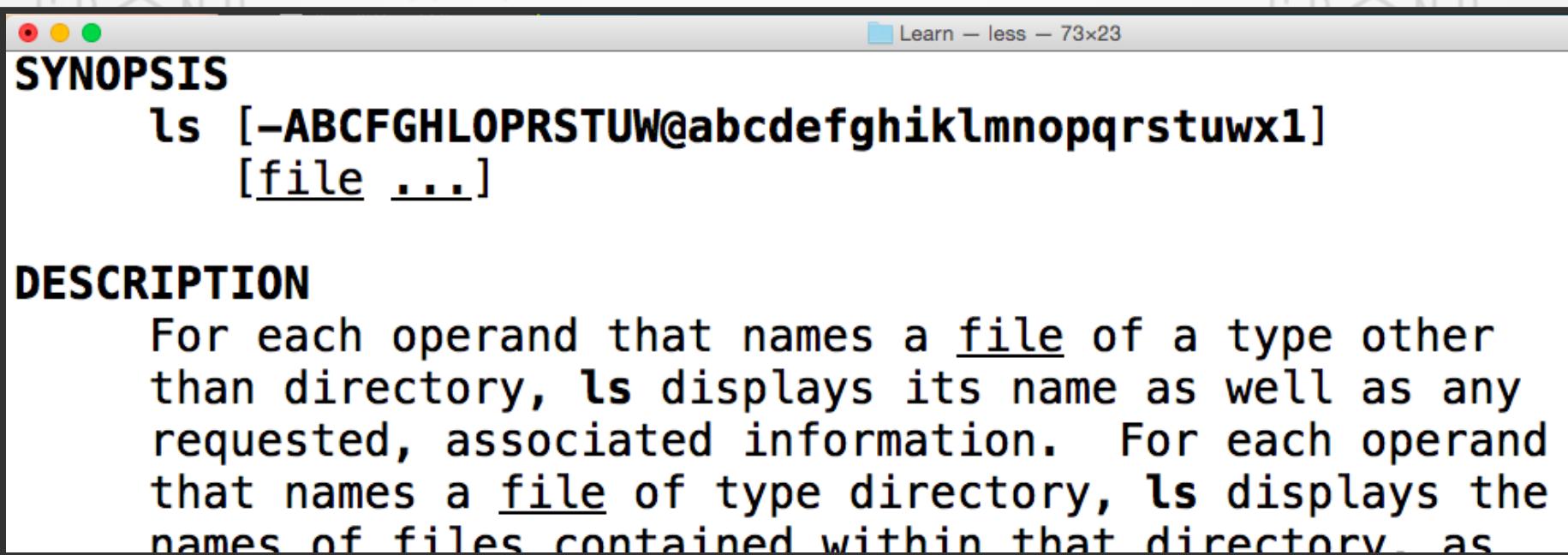
MANUAL

You've figured out what you *can* say, but not what the commands do. Use `man` with any command to see the manual for that command. Hit the 'q' key to escape.

```
$ man ls
```

On a Windows machine? Try using `help`.

NOBODY READS THE MANUAL

A terminal window with a dark gray background and a light gray header bar. The header bar features three colored window control buttons (red, yellow, green) on the left and the text "Learn - less - 73x23" on the right. The main content area of the terminal window contains the following text:

```
SYNOPSIS
ls [-ABCFGHL0PRSTUW@abcdefghiklmnopqrstuvwxyz1]
      [file ...]
```

DESCRIPTION

For each operand that names a file of a type other than directory, **ls** displays its name as well as any requested, associated information. For each operand that names a file of type directory, **ls** displays the names of files contained within that directory, as

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CREATION

NEW FILE

Create a new file by typing the `touch` command followed by the name of the file you wish to create. That file will be added to the current directory.

```
$ touch new-file.txt
```

On a Windows machine? Trying using `echo [some text] > new-file.txt`.



NEW FOLDER

Create a new directory (or folder) by typing the **mkdir** command followed by the name of the folder you wish to create. That folder will be added to the current directory.

```
$ mkdir my-stuff
```



PRO TIPS

PREVIOUS COMMANDS

We can cycle through any previously executed commands using the up and down arrows. This is useful for a number of reasons:

- Correcting small errors in long or complicated commands
- Retyping frequently used commands
- Recalling the steps that led to the current state

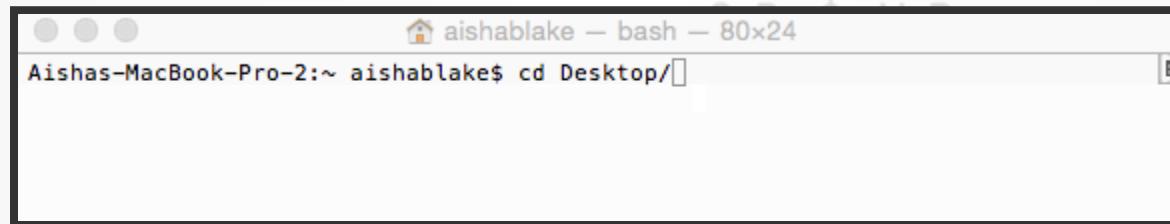
MULTIPLE COMMANDS

We can string multiple commands together with two ampersands (&&). These commands will be executed in order.

```
$ mkdir my-stuff && cd my-stuff
```

AUTOCOMPLETE

Pressing **tab** once you've started typing a directory or file name will trigger autocomplete.



```
aishablake ~ bash - 80x24
Aishas-MacBook-Pro-2:~ aishablake$ cd Desktop/
```



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CLEARING THE SCREEN

The `clear` command (you guessed it) *clears* the terminal window. We can also use the keyboard shortcut `Cmd+K`.

On a Windows machine? Try using `cls`.

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VERSION CONTROL



Version control (sometimes called source control) is a system that manages changes to a program, website, or other collection of files.

Version control facilitates two key processes in development:

- Collaboration
- Managing changes to the codebase

COLLABORATION

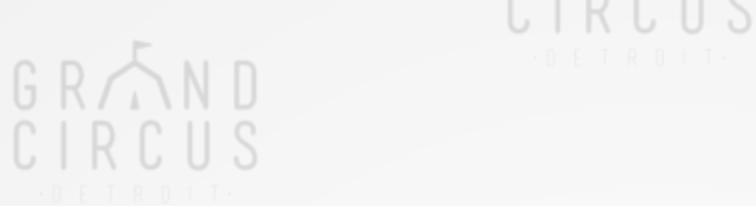
Version control allows you to work on the same project simultaneously with other people and helps to avoid and manage the conflicting changes.

MANAGING CHANGES

Version control systems allow for seamless integration of new code, easy viewing of previous changes, and makes it easy to undo a change set. It also allows us to revert documents back to a previous state.

Kinds of version control:

- Centralized
- Distributed



Centralized version control systems are run on one central server infrastructure. Each collaborator checks out the code from and merges changes into the main server.

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Distributed version control systems allow each collaborator to maintain a separate repository of the code which can be periodically reconciled with other peer repos.

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WHAT DOES IT ALL MEAN?!

We've perhaps already thrown around a couple of words that didn't make sense at the time. Well, now is the time for all to become clear!

Note Remember that you can (and should) always just ask if we say something you don't understand!

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REPO

A location where data is stored and managed

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UNTRACKED

When we talk about "untracked" files, we mean that Git isn't tracking the changes made to such files. It's aware that they exist, but that's about it.



TRACKED

Tracked files are monitored by Git. It keeps tabs on every little change made to tracked files.

GIT, GITHUB & THE COMMAND LINE

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GIT & GITHUB

Git is an open source, distributed version control system originally developed by Linus Torvalds.

GitHub is a social coding service that offers hosting for software projects that use Git as their source control.

GIT & GITHUB

The combination of the two have become the gold standard in the OSS community and startup scene. It is gaining major ground in the enterprise space as well.

Open your command prompt:

- Git Bash in Windows
- Terminal in OSX

INSTALLATION

VERIFY YOUR INSTALL

```
$ git --version
```

If you don't get some kind of error, you're good.

```
git version 2.4.1
```

IF YOU'RE NOT GOOD

If you've never used Git before, you may need to download it. If you're on a Mac, you'll already have Git installed out of the box but may want to upgrade to the latest stable version.

[Get Git!](#)

While we're at it, if you haven't already...

[Create a GitHub account!](#)



BASIC CONFIGURATION

```
$ git config --global user.name "Your Name"  
# sets the default name for git to use when you make a commit  
  
$ git config --global user.email "you@email.com"  
# sets the default email for git to use when you make a commit
```



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.GITIGNORE

WHY WE IGNORE

Sometimes, there will be private files that you want to keep private. Other times, you'll have files that get generated automatically that you don't necessarily want to have to keep track of.

THE SOLUTION

We can use a special file called `.gitignore` to list out everything we don't want Git to track.

A good item to toss in there right now is `.DS_Store`.



.GITIGNORE FOR JAVA

For right now, the only Java-specific thing we'll add to the `.gitignore` file is your `.class` files. Now your `.gitignore` should look something like this:

```
.DS_Store  
*.class
```





GIT COMMANDS



8 GIT COMMANDS YOU NEED

These cover most of what you need to do on a daily basis.

- `git init`
- `git clone`
- `git status`
- `git add`
- `git commit -m`
- `git push`
- `git pull`
- `git reset`



GIT INIT

Creates a new git repository in the current folder
including all child folders

```
$ cd Desktop    // or wherever you want the code to live
$ mkdir git-demo && cd git-demo
$ git init
```



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NEW FILES

Create a new file in the new empty repo.

Call it <yourname>.txt

```
$ touch aisha.txt
```

GIT STATUS

Reports the current status of the repo, such as whether any files have been modified or new files have been created.

```
$ git status
```

GIT ADD

Adds untracked files to the repo AND adds a tracked file's changes to the staging area, making it ready to be committed. `git add` must be called with a parameter that is the path to the file(s) you wish to add.

```
$ git add aisha.txt  
$ git status
```

STAGING AREA

There are 4 states a file can exist in a repo.

- Untracked
- Tracked
- Changed
- Staged
- Committed (which is really just back to 'Tracked')

GIT ADD

- After you add the file, check your status again. You should see that the file is now being tracked and is ready to be committed.
- Change the file in your editor in some way and save it. Run another `git status`. What happened?
- `git add` the file again. Check your `git status` again. What happened?

GIT COMMIT -M <MESSAGE>

- Once you have code staged, you can commit the change to your repo. This will create an anchor point that you can build from or return to if needed.

Protip: Don't forget the **-m**. If you do, you will be thrown into an in-terminal editor and that will ruin your whole day.

GIT COMMIT -M

Commit the new file to your git repo.

```
$ git status  
$ git commit -m "I added a new file!"
```

I check my status like a crazy person. Usually to make sure I'm not committing something I don't want to. **git status** will be one of your most used commands.

BONUS!

`git log` lets you view your repo's commit history

```
$ git log
```

(you may need to press 'q' to exit the log)

There are tons of options you can add to the `git log` command to customize how it looks.



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In order to push our code to GitHub, we will need to create a remote repository for it to live.

Code with me!

PUSHING TO A REMOTE

Once your changes are committed locally and you have a remote repository you can push to, you can do a `git push` to push your code to that repo.

PUSHING TO A REMOTE

`git push` pushes a local repo to a remote location.

```
$ git push origin master  
#or  
$ git push
```

PULLING FROM A REMOTE

`git pull` pulls changes from a remote repo and attempts to merge them with your local changes. You must be in sync with the latest changes to a remote before you can push changes up to it.

```
$ git pull origin master
```

#or

```
$ git pull
```

CLONING A REPO

`git clone` creates a local copy of a remote repository in your local file system allowing you to make local changes. Note: This will make a new directory of the repo's root folder whenever you run this command.

(do this in another directory, not your current project.)

```
$ git clone https://github.com/kroysemaj/git-demo
```

UNDOING BAD THINGS

`git checkout` allows you to remove the changes to a file before it has been staged.

Make some changes to your file and save them.

```
$ git checkout aisha.txt  
$ git status
```

All of your changes will be reset to the state of the file in the last commit.

UNDOING BAD THINGS

With `git reset` you can undo changes you've made or completely destroy all of your changes if you make a real mess of things.

Make more changes to your file. Now stage them.

```
$ git status  
$ git reset HEAD aisha.txt  
$ git status
```

This will discard all of the staged changes to your file.

WRAP UP

Git is awesome but it's a little tough to grok at first. You will be learning it in the best way, you're being forced to. We will use git for all of our project work. I encourage you to do the same for your personal projects as well.

Other resources:

- Try Git
- git immersion

GITTING STARTED

Put your last lab up on GitHub!

All labs from this point forward will be tracked using Git and hosted on GitHub. You'll turn those labs in by submitting a link to the corresponding repo.

INSTRUCTIONS

1. Create a new repo on GitHub.
2. Create a new java project.
3. Initialize a new Git repo in your new java project folder.
4. Add everything and make your initial commit.
5. Add and push to your remote repo.