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Bash, Regular Expressions, and Version Control

What you will be able to do:

- Differentiate jargon:
  - Bash, shell, command line, terminal, prompt
- Use the shell to navigate and do basic tasks
- Write regular expressions
- Setup and use git with Github for version control

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Bash

Put in chat any definitions you know already

- Bash
- Shell
- Command line
- Terminal
- Prompt

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Definitions

- Terminal – What a shell is run on – connects UI to computing resource
  - Used to be dedicated hardware you visited in basement
  - Now it's a software application
- Shell – Command line interpreter which differs by Operating System
  - Example: Windows is called Command Prompt
- Bash – **B**ourne **A**gain **SH**ell – Unix Shell
- Command line (CLI) – The interface you type commands on
- Prompt – The shell's signal it is ready for a command

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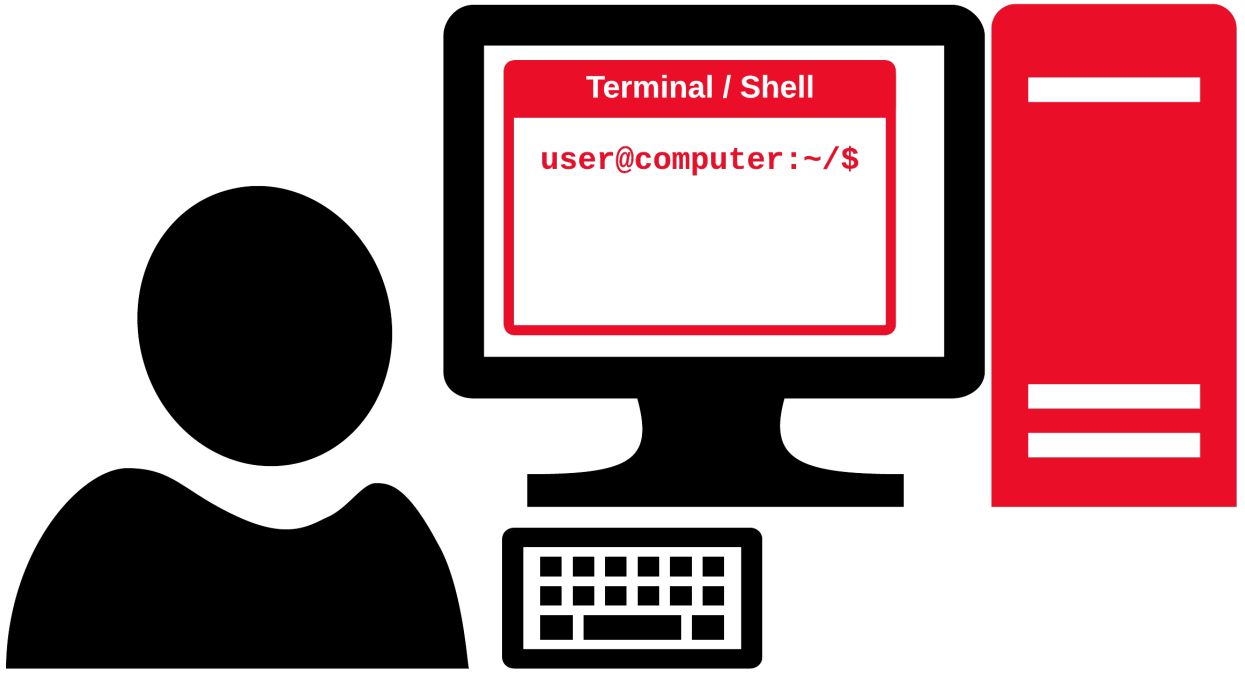
How we interact with computers

- You open the **terminal** which starts the **shell**. Some terminals allow you to open multiple shells.
- The **command line** loads and starts printing information.
- When you see the **prompt** (generally in the format `user@computer:~/location/$`) the system is ready for a command.



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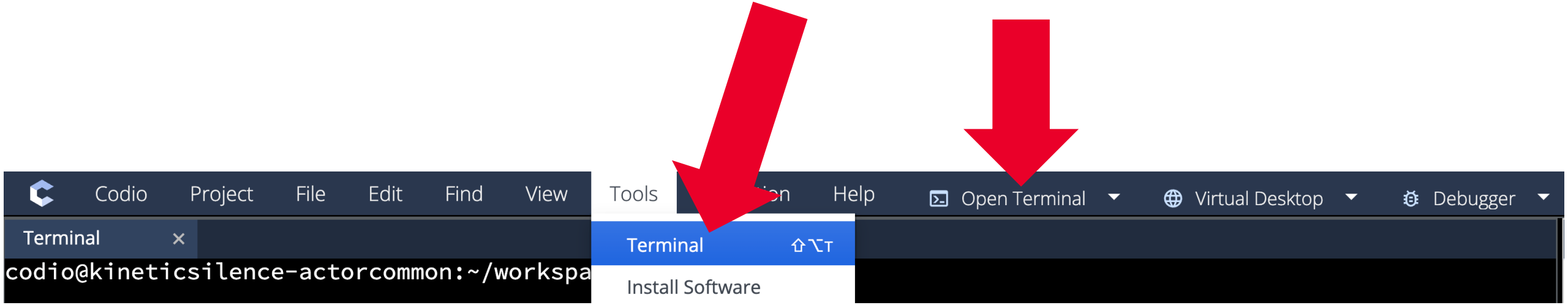
Opening the Terminal in Codio

There are a few ways to open the terminal from the top menu



In the terminal, try typing `echo "Hello shell!”` and press Enter/Return

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Basic Bash Navigation Commands

- Where am I?
  - `pwd` – path to working directory
- What is here?
  - `ls` – list
  - `ls -a` – list all (including hidden)
  - `ls -R` – list recursively
- Go to folder/directory
  - `cd name-of-folder` – go to named folder
  - `cd ..` – go to enclosing folder
  - `cd /` – go to root directory

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Basic Bash File and Variable Commands

- Directories and Files
  - `mkdir folder-name` – creates directory
  - `rm folder-name` – removes directory
  - `touch file-name` – creates file
  - `nano file-name` – opens file in editor
- Variables
  - `NAME="SEO Tech Developer"`
    – assign variable value with =
  - `echo $NAME` – access variable value with $
- Environment Variables
  - `env` – print all environment variables
    - If you already know the variable name, you can print environment variables using `echo`
  - `export VARIABLE_NAME=9999`
    – creates environment variable
  - `export` only sets the environment variable for that shell. *What happens if you try to see it in a different shell?*

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Click here for a list of more commands

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Regular Expressions

Regular Expressions: Character Patterns

- Regular expressions define patterns of characters
- You have probably seen regular expressions – for example:
  - `'*.py'` – all files with extension .py
  - `'[0-9]'` – a single digit number
  - `'[Hh]ello'` – hello or Hello
- Regular expressions are used in many different languages including python and Bash – and RegEx syntax is similar across languages

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RegEx Basics and Quantifiers Syntax

Character	Description
`.`	Match one character of any type
`\d`	Match one number in range 0−9
`\D`	Match non-number
`\w`	Match one “word” (including letters, digits, and _)
`\W`	Match one non-word character
`\s`	Match one whitespace character (space, tab, newline)
`[list]`	Match one character of a defined set
`[0-9]`	Match one integer within a range

Character	Description
`?`	Match zero or one instances of the preceding character
`+`	Match one or more instances of the preceding character
`*`	Match zero or more instances of the preceding character
`{5}`	Match a specific number of instances of the preceding character
`{,5}`	Match 0 to 5 instances of the preceding character
`{5,}`	Match 5 or more instances of the preceding character
`{2,5}`	Match at least 2 or at most 5 instances of the preceding character

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Put your answer in chat

- People build web crawlers which collect people's email addresses.
- What is a RegEx that would capture a wide variety of email addresses?
  - Email examples to consider:
    - help@codio.com
    - Nikki.Susca@seo-usa.org
    - akinwand@mtl.mit.edu

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Make sure you match email addresses only – Does your solution match Twitter / Instagram handles too?

Regular Expressions: Utilities

- To use regular expressions in Bash, you will need to use a utility to interpret them. Some common ones are:
  - `grep`
  - `sed`
  - `awk`
  - `expr`
- You can read a summary of each on their manual page. Use the `man` command to open the manual – for example: `man grep`

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Regular Expressions: Example

- An example of how to use `grep`:
  - `grep -E '[Yy]ou' greeneggs.txt`
    - Matches both 'You' and 'you'

```
You do not like
Could you, would you,
Would you, could you,
Not in a car! You let me be!
You do not like them. So you say.
Try them! Try them! And you may.
```

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Version Control

What is Version Control?

- You already use version control:
  - Save points in a video game
  - Multiple drafts of an essay
  - GoogleDocs version history
- Same idea is used for code
  - Most popular tool is `git`
- Make sure to use good labels for your versions!

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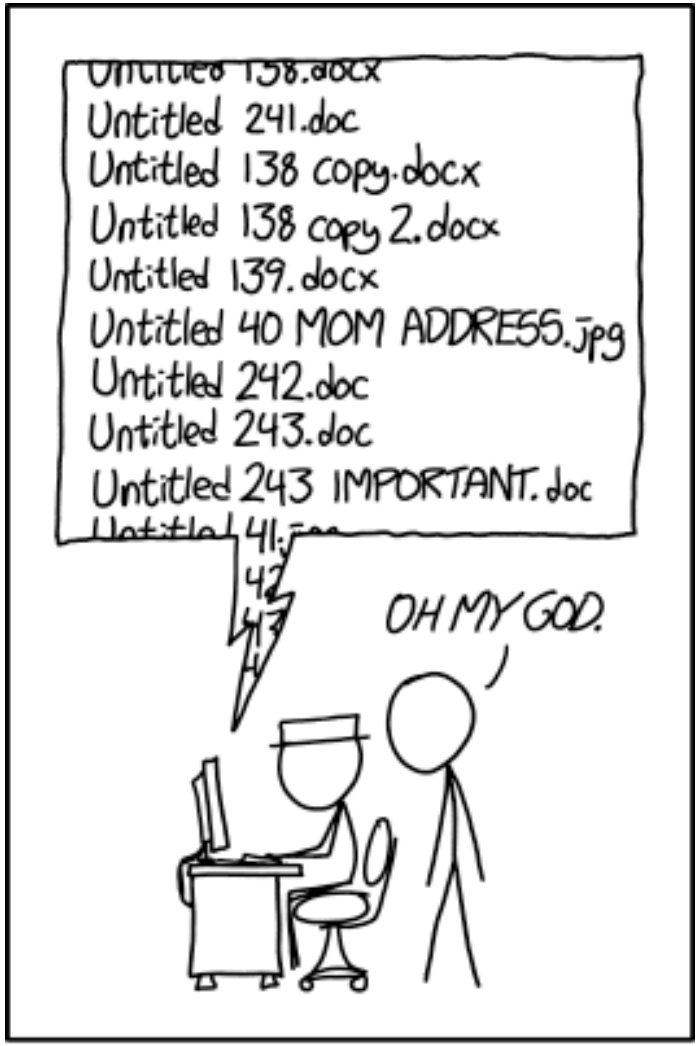
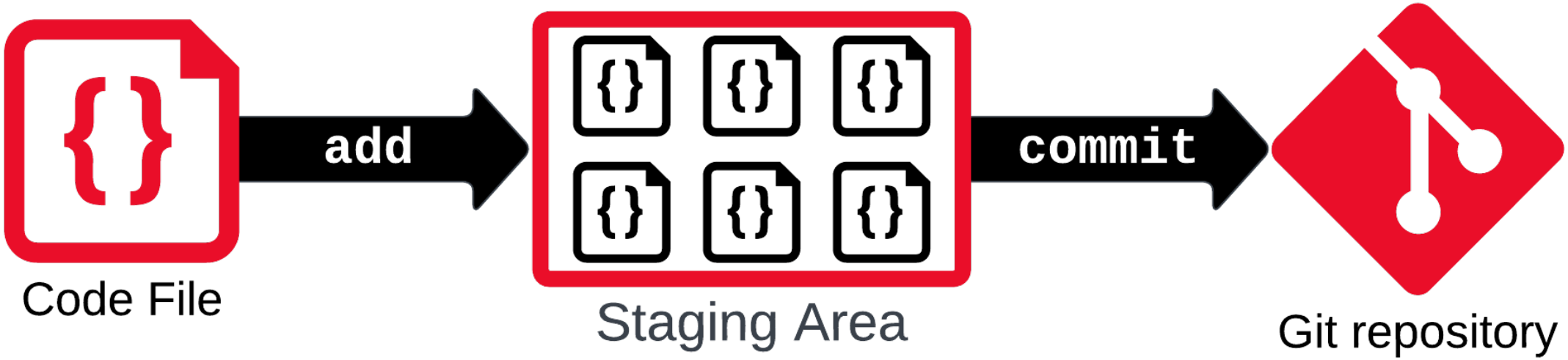


- To get started, simply initialize the repository:
  - `git init`
- If at any point you want to see a list of your save points which git calls commits, you can use:
  - `git log`

Git: Local Repositories

- To create a commit or save point:
  - `git add filename` vs `git add .`
  - `git commit –m “commit message”`



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Remote Repositories: Github

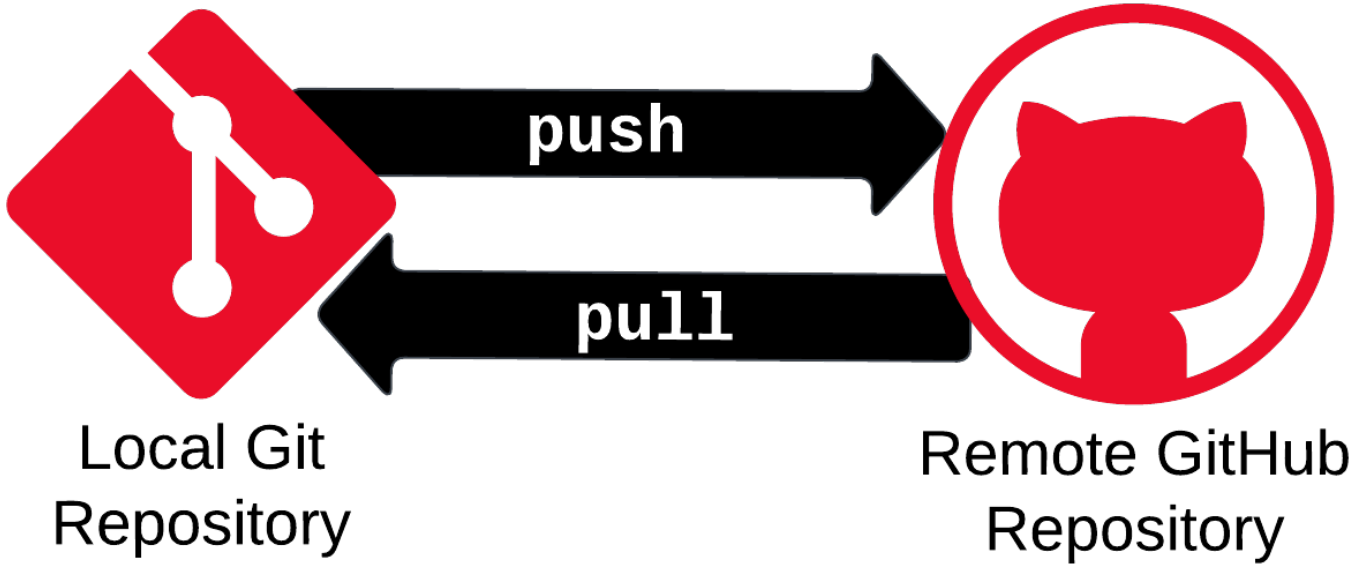
- Often you are collaborating on code and want a central repository.

  This won't be on someone's laptop but instead in the cloud.

  - Github is one of the most popular tools for remote repositories

- `pull` or `push` code between a local and remote repository:

  - `git push`
  - `git pull`



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What questions do you have about…

- Differentiating jargon:
  - Bash, shell, command line, terminal, prompt
- Using the shell to navigate and do basic tasks
- Writing regular expressions
- Setting up and using git with Github for version control

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Thank you!