

Hack Astro Academy



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Class Objectives

- 1. Recap Terminal Commands**
- 2. Introduce Terminal Based Text Editors(vi/vim)**
- 3. Outline Programmatic Thinking**
- 4. In-class Assignment**

Recap: Terminal Commands

ls:

list the content of the directory



mkdir:

Makes a directory



cd:

moves you from one directory to another



pwd:

shows the present working directory (i.e. The directory you are currently at)

Recap: Terminal Commands

touch: makes a file and/or updates time of last used

cat: opens a file

head/tail: shows the first/last 5 lines in a file

rm/rmdir: remove file/remove directory*

Terminal Commands

man: short for manual, lists the instruction for how to use the command that follows it. I.e. `man ls` will list the manual for the `ls` command

Editing Files Through Terminal

```
GNU nano 4.9.3 /Users/smitty/GitHub/scripts/packapp.zsh
1 |#!/bin/zsh
2
3 #
4 # packapp
5 #
6 # App release preparation script
7 #
8 # @author Tony Smith
9 # @copyright 2020, Tony Smith
10 # @version 4.0.1
11 # @license TBD
12 #
13
14
15 # Simple function to present help information
16 show_help() {
17     echo -e "\npackapp -- create a signed and notarized app package\n"
18     echo "This script requires an Apple Developer Account. You will need to set up an app key"
19     echo "for the Apple ID linked to your Developer Account, and to have saved this key in your"
20     echo "Mac's keychain under the ID 'AC_PASSWORD'. Pass the keychain item's account name to"
21     echo "the script as your username."
22     echo -e "\nUsage: packapp [OPTIONS] <app-path>\n"
23     echo "Options:"
24     echo "  -s / --scripts [path]  - Add pre- and/or post-install scripts to the package."
25     echo "  -u / --user             - Your username."
26     echo "  -c / --cert             - Your Developer ID Installer certificate descriptor, eg."
27     echo "  -c / --cert             - 'Developer ID Installer: Fred Bloggs (ABCDEF1234)'"
28     echo "  -v / --verbose          - Show extra informational output."
29     echo -e "  -h / --help             - This help page.\n"
30     echo "Example:"
31     echo "  packapp.zsh -u my_keychain_un -c \"Developer ID Installer: Fred Bloggs (ABCDEF1234)\" \"\$HOME/my app.app\""
32     echo
33 }
34
35
36 # Exit script on fail
37 set -e
38 setopt nomatch
39
```


Introduction to vim/vi

What is Vim/Vi?

A powerful text editor commonly used in Unix/Linux environments. Vim (Vi IMproved) extends the original Vi with additional features.

Key Features:

- Lightweight and efficient.
- Designed for editing text directly in the terminal.
- Supports syntax highlighting, search, and macros.
- Highly customizable and scriptable.

Introduction to vim/vi

Modes of Operation:

1. **Normal Mode:** Navigation and text manipulation.
2. **Insert Mode:** Text entry and editing.
3. **Command Mode:** Executes commands (e.g., save, exit).
4. **Visual Mode:** Selects and manipulates text.

Introduction to vim/vi

Basic Commands:

- Enter **Insert Mode**: Press **i** or **a**.
- Exit Insert Mode: Press **Esc**.
- Save and Exit: **:wq**.
- Quit without Saving: **:q!**.

Note: Mouse clicks do NOT work on terminal, navigating the text through vim is done through the arrows on your keyboard or through vi/vim shortcuts

Introduction to vim/vi

Useful Shortcuts:

- **W**: move to beginning of next word after a whitespace
- **B**: move to the beginning of the previous word before a white space
- **0**: move to the beginning of the line
- **\$**: move to the end of the line

More vi/vim shortcuts can be found here:

<https://gist.github.com/glnds/11027696>

Thinking like a Programmer

Demonstration of vi

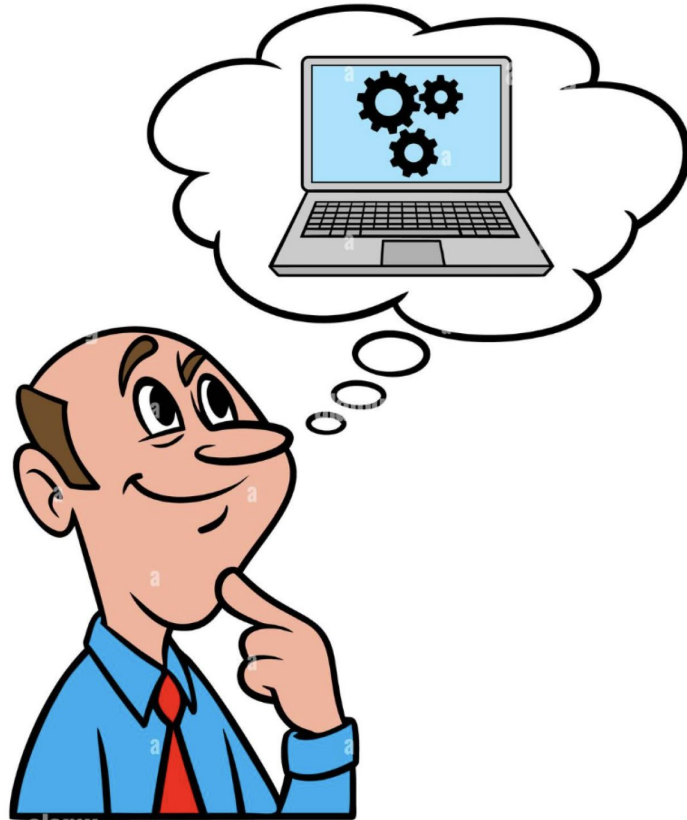
Your Turn (~5 minutes)

In the Week_02 folder there is a file labeled:

text_editor_assignment.txt

**Read the contents of the file and perform the actions outlined
in the file**

Thinking like a Programmer



Overview on How Computers Work

- Question:
 - In the previous lecture we covered terminal commands. How did the computer know what to do when we gave it certain commands like `ls`, `cd`, `cat`?

Overview on how Computers Work

- The computer knew what these commands are because someone has coded up what a computer should do when it sees those commands.
- These commands are a set of instructions that get executed when the correct input is given. These set of instructions are what we call as algorithms

Introducing Algorithms

What is an Algorithm?

An algorithm is a step-by-step, ordered list of instructions designed to solve a specific problem or perform a task.

Key Characteristics:

1. **Clear and Unambiguous:** Every step is precise and easily understood.
2. **Well-Defined Inputs and Outputs:** Starts with given inputs and ends with specific outputs.
3. **Finiteness:** Completes after a finite number of steps.
4. **Effectiveness:** Each step can be performed in a reasonable amount of time

Why Learn Algorithms?

- They form the foundation of programming and problem-solving.
- Efficient algorithms save time and resources in software development.

An Analogy of Algorithm: Recipes

1. Grab some flour, eggs, and milk.
2. Mix everything together.
3. Heat up a pan and pour some batter in.
4. Flip it when it looks right.
5. Cook until done and eat.

An Analogy of Algorithm: Recipes

Ingredients:

- 1 cup all-purpose flour
- 1 tablespoon sugar
- 1 teaspoon baking powder
- 1/2 teaspoon baking soda
- 1/4 teaspoon salt
- 3/4 cup milk
- 1 egg
- 2 tablespoons melted butter or oil

Instructions:

1. **Prepare the Dry Ingredients:**

In a large mixing bowl, combine 1 cup of flour, 1 tablespoon of sugar, 1 teaspoon of baking powder, 1/2 teaspoon of baking soda, and 1/4 teaspoon of salt. Stir to mix evenly.

2. **Prepare the Wet Ingredients:**

In a separate bowl, whisk together 3/4 cup of milk, 1 egg, and 2 tablespoons of melted butter (or oil).

3. **Combine Ingredients:**

Slowly pour the wet ingredients into the bowl with the dry ingredients. Stir gently until just combined. Small lumps in the batter are okay—don't overmix.

4. **Heat the Pan:** Place a non-stick pan or griddle over medium heat. Lightly grease the surface with a small amount of butter or oil.

5. **Cook the Pancakes:**

Pour 1/4 cup of batter onto the pan for each pancake. Cook for 2-3 minutes, or until bubbles form on the surface and the edges look set.

6. **Flip and Finish Cooking:** Use a spatula to flip the pancake. Cook for an additional 1-2 minutes until the underside is golden brown.

7. **Serve:** Remove from the pan and serve warm with your favorite toppings like syrup, fruit, or whipped cream.

Exercise: (~5-10 minutes)

- Read the instructions provided in the **pbj_assignment.txt** file and use vi to write your detailed instructions on making PB&J to a file named *pbj_instructions.txt*

Final Thoughts

- Computers are powerful machines and work by following algorithms
- To make a computer execute a task the algorithm needs to be exact, and clear
- One thing to keep in mind as we start building our own algorithms is that computers only do what we tell it to do.
 - If something did not execute as we expect we need to revisit the steps we provided the computer and see what was unclear