BACKGROUND

The files and directories ("folders") on a computer are organized in a hierarchical structure. Your operating system's graphical interface (Microsoft's *Windows*, Apples *macOS*, Ubuntu's *Gnome*) allows you to intuitively interact with this hierarchy by clicking to select a file or folder, click-dragging to move a file or folder, and double-clicking to open a folder or to to open a file in its preferred application.

It's important for you to have a visual understanding of this hierarchical system so you can better understand where everything is located relative to everything else.

WHAT'S A FILE / DOCUMENT?

Each "document" that you interact with on the computer is called a *file*. The terms "file" and "document" are used interchangeably. A file might include a word-processing document that you're using to write a paper, a PDF-version of a report, a JPG image of a digital photo, an email, a text message, a movie that you downloaded...

Files on a computer always have a name, and that name often consists of two parts: the *filename* and the *extension*. The *filename* consists of a series of letters, numbers, and maybe a few other characters like a hyphen (" – ") or an underscore (" _ "). Although you're technically allowed to use some other characters in a filename (such as a space " "), it's usually better not to.

The *extension* of the file name follows a period (" . ") and is usually used to indicate the type of the file. A `.docx` file, for example, is a Microsoft Word document, while `.xlsx` is a Microsoft Excel spreadsheet. A `.html` file is a file used to display a webpage, a `.jpg` is a graphics file, and `.txt` is a file that contains nothing but plain text characters.

You may not always *see* the files that you're working with, especially if you use a smartphone as your main computer. It's important to know, however, files are the foundation of all your data on a computer. That's why the computers system for organizing this information is called a *file system*.

WHAT'S A FOLDER / DIRECTORY?

Files are often grouped together into *folders*, which are usually called *directories*. Both terms are used interchangeably. A folder on a computer works the same was as manila folders in an office work: they serve as a way of organizing files by grouping related documents together.

I have a directory on my computer called `dog_photos` that has a bunch of photos and movies of my dog Lola.

A directory is easy to identify on your computer because it is usually represented graphically by a "folder"-shaped icon. Folders can contain files, as we've said, but they can also contain other folders as well. I might have a folder called `photos` that contains a folder `photos_2018` that in turn contains folders called `family_photos` and `dog_photos`.

Again, you may not *see* the folders that are used to organize your stuff, especially on a smartphone. But those directories are there, and you should know about them.

VISUALIZING THE FILE STRUCTURE

Your computer's operating system includes a *file system* that allows you to work with files located on your computer. Microsoft's *Windows*, Apples *macOS*, and any Linux window system allow you to view the contents of your computer's hard drive in a number of different ways. Here's one view of some nested files in Apple's OS X.

Computer Science   Worksheet—Files and Folders
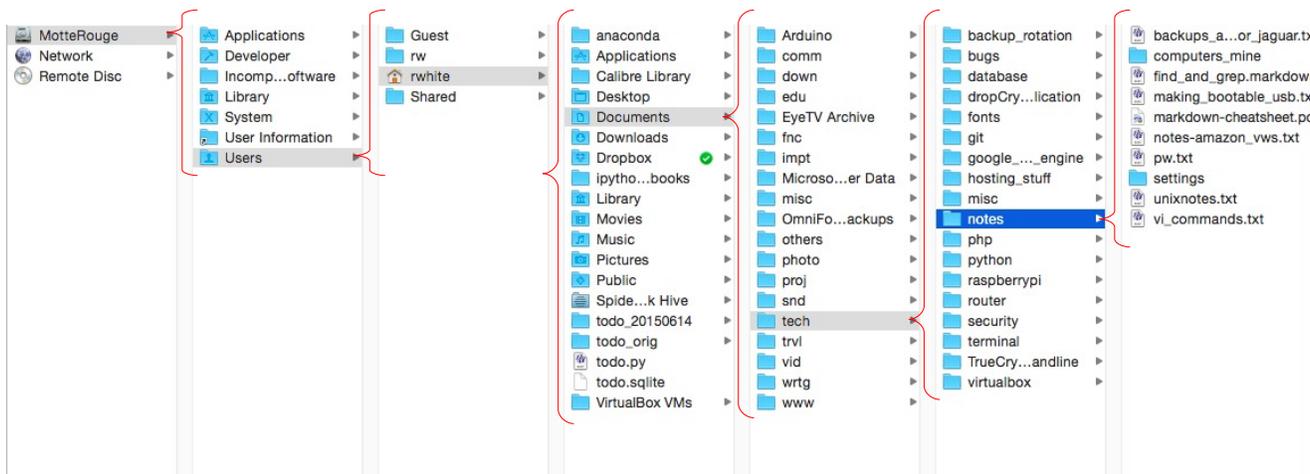
The computer's main drive on this particular computer is named MotteRouge, but it is more generally referred to as the root directory, and indicated with a forward-slash character: / . contains seven directories including one called Users, and that folder in turn contains four directories including my home folder, rwhite, and so on.

On the next page is another way to visualize those same nested files and directories. Not all files and directories are shown in this diagram, but this is a good example.

Use the file system shown to answer the questions below.
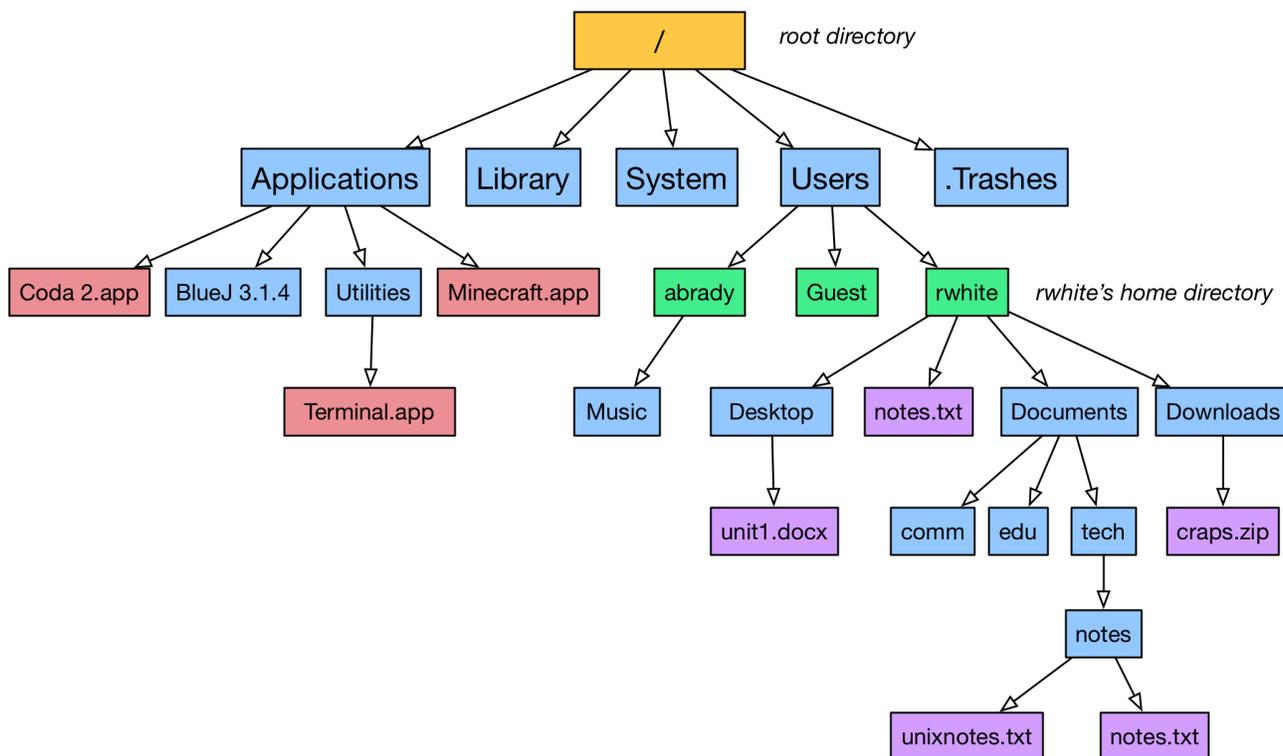
QUESTIONS

1. Is the block with the name craps.zip above a *file* or a *directory*? How do you know?

2. How many files are contained in the directory called notes ? What are their names?

3. What are the two folders that contain a file called `notes.txt` ?

4. What color system is being used for this diagram? What types of items are indicated by each color?

    1. blue = _____

    2. red = _____

    3. purple = _____

    4. green = _____

    5. orange = _____

5. How many users are there on this system that have home directories?

6. What *extension* do some files in the Applications directory have?

7. What two directories in the chart contain both files and directories in them?

8. The user `abrady` records songs on the computer and saves them. Which directory does she probably keep these recordings in if she wants to keep her files well-organized?

9. In this diagram, the *home* directory `rwhite` is listed as having just three directories: `Desktop`, `Documents`, and `Downloads`. When you look at your *home* directory, either on your own computer or a computer in the classroom, what is the name of your home directory? What additional directories do you see listed inside that home directory?