CS170 SP2017 Assignment 1 Solution

Chapter 1: 4, 5, 6, 7, 10

4. What is the Free Software Foundation/GNU? What is Linux? Which parts of the Linux operating system did each provide? Who else has helped build and refine this operating system?
The Free Software Foundation (www.fsf.org) is the principal organizational sponsor of the GNU Project. GNU developed many of the tools, including the C compiler, that are part of the Linux operating system. Linux is the name of the operating system kernel developed by Linus Torvalds, which has since been expanded and improved by thousands of people on the Internet.
Torvalds' kernel and GNU's tools work together as the Linux operating system.

5. In which language is Linux written? What does the language have to do with the success of Linux?
Most of Linux is written in the C programming language. When written in a portable style, C programs can be moved from one platform (processor or CPU-based system) to another by simply recompiling the code. Portability means that manufacturers have a ready supply of software, operating systems, and applications when they modify an existing platform or develop a new one.

6. What is a utility program?
A utility (program), sometimes referred to as a command, performs a task that is frequently related to the operating system. A utility is simpler than an application program, although no clear line separates the two. Linux distributions
include many utilities. You can also download many utilities from the Internet.
Examples of utilities are cp (copies a file), ls (lists information about files), ssh (securely connects to a remote computer), and df (lists information about free space on system devices such as hard disks).

7. What is a shell? How does it work with the kernel? With the user?
A shell is a command interpreter; it starts the program you call from a command line and passes your instructions (arguments) to the program. The shell is also a programming language; it can run files of commands, similar to DOS batch files, when you issue a single command to the shell.

10. What is the difference between a multiuser and a multitasking system?
A multiuser system can support more than one user at a time.
A multitasking system can process more than one task at a time.

Chapter 2: 1, 5, 6, 7, 8

1. The following message is displayed when you attempt to log in with an incorrect username *or* an incorrect password:

Login incorrect

This message does not indicate whether your username, your password, or both are invalid. Why does it not tell you this information?

If the system were to say that a password that someone entered was incorrect, it would be saying that the username was valid. This information could be used by a cracker to help break into the system. Saying that a password is valid for an invalid username does not make sense, but saying that a password is valid on the system could help a cracker in the same manner.

5. Try to change your password to **dog**. What happens? Now change it to a more secure password. What makes that password relatively secure?

$ **passwd**
passwd
Changing password for user sam.
Changing password for sam.
(current) UNIX password:
New password:
BAD PASSWORD: it is WAY too short
...
See page 44 for a list of criteria that make a password relatively secure.

6. How would you display a list of utilities that compress files?

$ **apropos compress**

7. How would you repeat the second preceding command line, edit it, and then execute it?

Press the UP ARROW key two times to display the second preceding command line. Then use the LEFT ARROW and RIGHT ARROW keys to move the cursor, the erase key to delete characters, and normal keyboard keys to add characters to the command line. Press RETURN to execute the command line.

8. Briefly, what information does the **--help** option display for the tar utility? How would you display this information one screen at a time?

When used with tar, the **--help** option displays usage information, examples, and descriptions of the many tar options. Send the output through less to view the output one screen at a time:

$ **tar --help | less**