

## Chapter 2

For questions 1-3, your Bash shell currently looks like this:

```
[zappaf@mycomputer foxr]$
```

1. Who are you logged in as?
2. What directory are you currently in?
3. You type `cd ~`. What changes in your prompt?
4. What does the `who` command do?
  - a. It outputs your user name
  - b. It outputs information about your operating system
  - c. It outputs a list of users currently logged into your computer
  - d. It outputs the contents of your current directory
  - e. It outputs your current working directory
5. True/false: You are in a Bash shell. Typing in the `bash` instruction results in the starting of a new shell such that any definitions from the outer shell are “hidden” (unavailable).
6. You have opened a terminal window which is running a Bash shell. You type `bash`. What happens when you type `exit`?
  - a. Your terminal window closes
  - b. Your terminal window remains open but all Bash shells are closed
  - c. You move from a Bash shell to the default shell
  - d. You move from the newer, inner bash shell to the older, outer bash shell
  - e. You are logged off of the computer
7. True/false: You can enter multiple instructions at once by separating the instructions with a semicolon as in `who; pwd; ls <enter>`.
8. True/false: In entering the `ls` command, you can include options but you must include parameters.
9. Which of the following options of the `ls` command provides a “long listing”?
  - a. `-d`
  - b. `-1` (the number one)
  - c. `-l` (a lower case “L”)
  - d. `-L`
  - e. `-R`
10. How does the command `ls -a` differ from the command `ls`?
  - a. The output includes “hidden files” (files whose names start with a period).
  - b. The output includes the directories `.` and `..`.
  - c. The output includes “hidden files” (files whose names start with a period) as well as the directories `.` and `..`.
  - d. The output only includes directories
  - e. The output includes all files in the directory and directory names but not directory contents.

The following long listing should be used to answer questions 11-13.

```

-rwxr--r--. 1  foxr foxr 183  Jul  23      2014  file1.txt
-rw-rw-rw-. 1  foxr foxr 577  Jul  28      2014  file2.txt
drwxr-xr-x. 1  foxr cool 1024 Jul  16      2014  files

```

11. True/false: The first character in the output denotes the type of entity, in this case whether the item is a file or a directory.
12. True/false: All three of the items listed here are owned by the same user, foxr.
13. The fifth entry on each line is
  - a. The time that the item was created on the given day
  - b. The number of times the item has been accessed since it was created
  - c. The number of links to the item
  - d. The size of the item
  - e. The owner's ID number
14. You perform `man command` for some *command*. Which portion of the man page provides you the syntax for how to use the command by stating the optional and required components of the command?
  - a. The name
  - b. The synopsis
  - c. The description
  - d. Examples
  - e. See also
15. When you do a `man` on a command, it tells you how to use the command. Imagine for some command, you get the following. What does the notation `[-aeiou]` mean?
 

```
command [-aeiou] [file]...
```

  - a. You must use at least one of the options listed (a, e, i, o or u)
  - b. You must use no more than one of the options listed
  - c. You may use as many options as listed but must use at least one of them
  - d. You may use any combination of the options listed including none at all
  - e. You must use the same number of options as files listed so that if you have no files listed, you cannot use any options
16. True/false: All Linux commands exit with some exit code.
17. True/false: If there is a Files section to a man page, then this describes the types of files that you need to specify in the command's parameter section.
18. You can't remember the name of a command but know what it does. You want to identify its name. Which of these commands might help you identify the command name?
  - a. `apropos`
  - b. `help`
  - c. `list`
  - d. `info`
  - e. `man`

Answer each of questions 19-22 using the following history list assuming that command 357 is the last one entered such that if a question has a new command, it will not impact other questions (that is, the command described in question 19 will not affect the history list for question 20-22).

```
351  pwd
352  ls -l /etc
353  cd ..
354  ls -a
355  cd /etc
356  cat passwd
357  ls /home
```

19. We want to re-execute the last command. Which of the following will not accomplish this?
  - a. !!
  - b. !357
  - c. !l
  - d. !ls
  - e. !ls -
20. What command is executed if you enter `!ls -` <enter>?
21. Will `!c` and `!ca` cause different instructions to execute?
22. We want to re-execute instruction 352. Aside from `!352`, what is the shortest instruction we can enter to re-execute it?
23. True/false: All variables defined in a Bash shell are environment variables, defined from within scripts or other software.
24. By default, a variable defined in a Bash shell stores which type of information?
  - a. Any number
  - b. Single character
  - c. Integer number
  - d. Real (floating poing) number
  - e. String
25. True/false: When assigning a variable a value, you must include the `$` prior to the variable name as in `$VAR=0`.

Assume `FIRST=Frank` and `LAST=Zappa`, answer questions 26-28.

26. Using the variables, which of these echo statements properly outputs `Hello Frank Zappa`?
  - a. `echo FIRST LAST`
  - b. `echo "FIRST LAST"`
  - c. `echo $FIRST LAST`
  - d. `echo $FIRST $LAST`
  - e. `echo '$FIRST $LAST'`
27. Assume we execute `echo $FIRST; echo -n $LAST`. What is output?
  - a. `Frank -n Zappa`
  - b. `Frank Zappa`
  - c. `Frank`

- d. Frank                      Zappa
- e. \$FIRST  
\$LAST

28. True/false: There is a difference in the output between `echo "$FIRST $LAST"` and `echo ` $FIRST $LAST`` but no difference in the output between `echo "$FIRST $LAST"` and `echo $FIRST $LAST`.

You are currently in the directory `/etc`. You enter the command `cd /home/foxr`. Answer questions 29-30.

29. What does the environment variable `PWD` store?

- a. `/etc`
- b. `/home`
- c. `/home/foxr`
- d. `/`
- e. There is no way to know

30. Which of the following environment variables would now be storing the value `/etc`?

- a. `HOME`
- b. `OLDPWD`
- c. `PWD`
- d. `PATH`
- e. None of the above, no environment variable would take on the old directory

31. True/false: Once an environment variable has been defined, a user is unable to alter it.

32. What does the environment variable `PS1` store?

- a. Information about running processes
- b. Information about the most recently started process
- c. The specification of the user's prompt within the shell
- d. The User's user name
- e. The current working directory

33. Users will define aliases for several reasons. Which of the following is not such a reason?

- a. To reduce the amount of typing for lengthy instructions
- b. So that complicated instructions do not have to be remembered
- c. So that common typos can be avoided
- d. So that dangerous instructions can be made safer
- e. All of the above are reasons for using aliases

34. True/false: An alias' name must start with a letter, for instance you could not write an alias whose name starts with a punctuation mark.

35. Write an alias called `lhome` what when issued will perform a long listing of your home directory.

36. What does the alias command do if you enter the word alias by itself?

37. Which of the following command line editing sequences moves your cursor to the end of the current word?

- a. control+e
  - b. control+f
  - c. escape+e
  - d. escape+f
  - e. escape+n
38. Which of the following command line editing sequences deletes from the current cursor position to the end of the current word?
- a. control+d
  - b. control+k
  - c. control+y
  - d. escape+d
  - e. escape+k
39. How does the redirection operator > differ from the redirection operator >>?
40. True/false: Since most Linux commands accept input from file rather than keyboard, the redirection operator < is seldom used when issued on Linux operations.
41. True/false: The Linux pipe operator (|) can be used between two Linux operations but you cannot use two pipe operators between three Linux operations.
42. Provide the complete Linux operation that includes proper redirection to create the new file foo.txt by concatenating all existing .txt files in the current directory.
43. Provide the complete Linux operation that includes a pipe to combine all .txt files of the current directory and perform a word count on them, obtaining the total number of words found.
44. Explain what the following Linux command does:  
`cat << quit | sort > foo.txt`
45. What does STDIN mean?
46. Match the following symbols with their role in Bash.
- |       |   |
|-------|---|
| a.    | 1. Obtain value stored in a variable            |
| b. >  | 2. User's home directory                        |
| c. ~  | 3. Precedes a command's option                  |
| d. !  | 4. Pipe output of a command to input of another |
| e. *  | 5. Separate multiple instructions               |
| f. \$ | 6. Assign a variable a value                    |
| g. ;  | 7. Recall from history list                     |
| h. =  | 8. Take output of a command and save to file    |
| i. -  | 9. Wildcard used in file commands               |
47. What is an exported variable?
48. Which of the following features will allow you to enter a portion of a filename, as long as it is unique, in a Linux command and have Bash fill in the full filename for you?
- a. Brace expansion
  - b. Filename completion
  - c. Filename expansion

- d. Escape completion
  - e. Tab completion
49. True/false: The features available in Bash are also available in other shells like the original Bourne shell (sh), C-shell (csh), TC-shell (tcsh) and Ash.
50. True/false: All programming languages use interpreters.
51. Order the following steps of the Bash interpreter when a command is input.
- i. Handle quotes
  - ii. Perform redirections
  - iii. Replace aliases with the aliased definitions
  - iv. Break input into individual tokens
  - v. Replace wildcards with matching files/directories
  - vi. Perform brace expansion
  - vii. Perform tilde expansion
  - viii. Execute arithmetic operations

Answers:

- 1. zappaf
- 2. foxr's home directory (/home/foxr)
- 3. The "foxr" becomes ~ (or zappaf)
- 4. c
- 5. True
- 6. d
- 7. True
- 8. False
- 9. c
- 10. c
- 11. True
- 12. True
- 13. d
- 14. b
- 15. d
- 16. False
- 17. False (it describes the files that the instruction operates on)
- 18. a
- 19. e
- 20. 354 (ls -a)
- 21. no, both execute the most recent c command, cat passwd (356)
- 22. !ls -l
- 23. False (users can define their own variables from either scripts or the command line)
- 24. e
- 25. False, you never include the \$ in front of the variable on the left hand side of the assignment statement.
- 26. d
- 27. c
- 28. True
- 29. c
- 30. b

- 31. False
- 32. c
- 33. e
- 34. False, you could for instance issue the alias `alias ..='cd ..'`
- 35. `alias lhome='ls -l ~'` (or `alias lhome='ls -l /home/username'`)
- 36. It lists all defined aliases of this shell
- 37. d
- 38. d
- 39. `>` will overwrite the destination file if it already exists while `>>` will append to the destination file if it already exists. If the destination file does not already exist, both do the same thing.
- 40. True (`<` is really only useful when you want to redirect input to a shell script)
- 41. False (you can chain together numerous commands using pipes)
- 42. `cat *.txt > foo.txt` (note that `cat *.txt >> foo.txt` is not correct because the question asks for a new file)
- 43. `cat *.txt | wc -w`
- 44. The `cat` command waits for the user to input text from the keyboard, including enter keys, stopping only once the user enters "quit" on a single line, it then takes all of the input, sorts it line-by-line and stores the sorted list to the file `foo.txt` (overwriting it if it already exists).
- 45. It is standard input, the default source of input for Linux commands. This is usually keyboard unless redirected.
- 46. a-4, b-8, c-2, d-7, e-9, f-1, g-5, h-6, i-3
- 47. A variable defined in one shell session or program which is available in other sessions or outside the program.
- 48. e
- 49. False (some features are found in all but many features are found only in some or one type of shell)
- 50. False (many use compilers instead)
- 51. iv, i, iii, vi, vii, viii, ii, v