

CSE/ISE 337 Assignment 4 – System Administration, GUIs, and More (Spring 2019)

Due Date: Friday, May 10th, 2019, at 11:55 PM

Instructions:

- (a) When writing programs, you **must** use the techniques that are described in the lectures. You may **not** use methods, modules, packages that were not covered in this course.
- (b) Start working on this assignment right away; you will find it very difficult to finish if you wait until the last day.
- (c) You **must** provide the commands used to answer each question, the method you used to find the answers using the command output, and selected output and/or commands to support/verify your answer.
- (d) We will use the allv Linux machines to mark your A4.
- (e) Use bash to do this assignment.
- (e) Several of the questions for this assignment assume a Unix environment. Your code **must** run on the allv Linux machines. Running only on your own computer will cost you up to 15 points.

1. Simple Unix Commands (15 pts)

- a. The Shell (3 pts)
 - i. What is your default login shell?
 - ii. What shell variety are you using?
 - iii. What is the command to invoke bash?
 - iv. What is the command to terminate the bash that you invoked in part (1.a.iii)?
- b. The Calendar (3 pts)
 - i. Read the man page for the command `cal`.
 - ii. Find the date of Easter (western church) in 2020.
 - iii. Display a six-month calendar starting with the previous month?
 - iv. Display a calendar of the first four months of 2020 that also includes week numbers.
- c. Viewing Files (3 pts)
 - i. View the contents of the file `/etc/cron.daily/apt-compat` one page at a time starting with page 1.
 - ii. How do you show the next page?
 - iii. How do you show the previous page?
 - iv. How do you exit from viewing the file?
- d. Files
 - i. Create an empty plaintext file named `337A4ans.txt` in your home directory.
 - ii. Read the help entry and the man page for the `wget` command.
 - iii. Use `wget` to retrieve the page `https://www.google.com` and save it to a file named `googleindex.html` in your home directory.
- e. File Paths
 - i. What is the absolute path name of the file you created in (1.d.i)?
 - ii. What is the relative path name of the file you created in (1.d.i) if your current directory is `/home`?

2. UNIX File System Access (15 pts)

a. File Access Permissions (3 pts)

- i. Navigate to your home directory.
- ii. Create a subdirectory names `A4A4`.
- iii. Create a file that contains some content called `myfileA4`.
- iv. What are the file access permissions of the subdirectory `A4A4` created in (2.a.ii.) and of the file `myfileA4` created in (2.a.iii)?
- v. Describe what operations can be performed on the subdirectory `A4A4` and on the file `myfileA4` and by whom. Be accurate, but concise.

b. File Operations (3 pts)

- i. Enter the directory `A4A4` created in (2.a.ii). Remain in this directory for the rest of (2.b).
- ii. Copy the file `myfileA4` created in (2.a.iii) into the current directory. Name the copy `copyfileA4`.
- iii. Remove `myfileA4` created in (2.a.iii).
- iv. Create a subdirectory named `dirA4` in the current directory.

c. Changing Access Permissions (3 pts)

- i. Return to your home directory.
- ii. Change the permissions of the subdirectory `A4A4` created in (2.a.ii) so that you cannot list the content of `A4A4`, but can display the content of the file `copyfileA4` in that directory.
- iii. After changing the permissions, can you enter the subdirectory `dirA4` created in (2.b.iv)?

d. More File Operations (3 pts)

- i. Create a clone of the subdirectory `A4A4` created in (2.a.ii), including the contents of all its subdirectories, sub-subdirectories, etc. and name it `cloneA4`.
- ii. Move the file `googleindex.html` created in (1.d.iii) from your home directory into the directory `cloneA4` created in 2.d.i.

e. Removal

- i. Remove all the contents of the directory `A4A4` created in (2.a.ii), including all sub, sub-sub content, etc.
- ii. Verify that `A4A4` is now empty.
- iii. Remove the now empty directory `A4A4`.

3. UNIX Shell Utilities (16 pts)

- a. What does the following command do? (Look up the `tee` command.)

```
cat *.log.1 *.log | grep " error" | tee e1 e2 | wc -l
```

- b. Find and Redirect

- i. Create a directory named `A4tmp` in your home directory.
- ii. Read the man page for the `find` command.
- iii. Use `find` to identify all the files (only files) within or below the `/var/log` directory that were created within the last 80 minutes. Direct all `STDERR` messages to a file named `logerror.txt` that is inside the `A4tmp` directory.

- c. Counting Items and Links

- i. How many entries are there in the `/usr/share/man/man1` directory?
- ii. How many of those entries are symbolic links? You can identify a symbolic link in the output of `ls -l`. A symbolic link will have the letter `l` at the start of its line, and it will also have an `"->"` sign in its line.

- d. Counting Words and Lines

- i. How many words and lines are there in `/usr/share/dict/words`?
- ii. Based on the result of (3.d.i) how many words are there on each line of the file?
- iii. Save the 800 words starting at word number 1000 into a file named `800w.txt` in your `~/A4tmp` directory.

4. Simple Scripting (10 pts)

Write a script using simple shell commands. The script takes a command line argument that specifies a directory `dir`. The script first changes directory to `dir`, then prints the following in sequence:

- (a) A line starting "Current date and time: ". Then on the same line, the current time and date.
- (b) A line starting "Current directory is : ". Then, on the same line, the absolute pathname of the current working directory.
- (c) An empty line
- (d) The line "--- 10 most recently modified directories ---"
- (e) the 10 most recently modified subdirectories in the current directory in long listing format (most recent first)
- (f) An empty line
- (g) The line "--- 6 largest files ---"
- (h) The 6 largest files in the current directory in long listing format (largest file last)
- (i) An empty line, followed by a line of 70 equal signs

Run your script three times, with three different input directories. Append the output of each script execution to a file called `log4.txt` in your `~/A4tmp` directory.

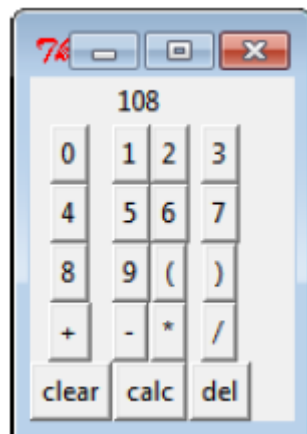
Note that you may assume that there are at least 6 files in an input directory. However, there may be any number of directories in the input directory.

5. GUI Scripting in Python with Tkinter (12 pts)

Do one of the following, either (a) or (b).

- a. Modify the data entry program, `gui-database.py`, discussed in lecture 19, to implement the remove contact view that I left unfinished.
 - i. The user should be able to search for contacts to be deleted by first name, last name, phone number or email address.
 - ii. If the search returns multiple results, the user should be able to specify which of those results should be deleted.
 - iii. The user should then be able to delete the selected contact (or contacts). It is removed from the contact list and will not show up on future searches.
 - iv. Display the results to the user. Produce output showing that the removal is complete and which contact has been removed.
 - v. Bonus (2 pts): Use the `Messagebox` widget to display the result of the deletion in a pop-up.
- b. Create a simple calculator GUI
 - i. Your calculator should allow the user to enter digits. (Inputs are all integers).
 - ii. Your calculator should support addition, subtraction, multiplication, and division.
 - iii. Your calculator should support placing expressions in parentheses.
 - iv. Your calculator should display the calculation entered by the user, and then the result of the calculation.
 - v. Your calculator should allow your user to clear the display and delete from entries to correct mistaken inputs.
 - vi. Use the `grid` function to layout the widgets in your calculator interface.

Here is an example of what your calculator GUI might look like (It does not have to look like this).



Submission Format (2 pts for the right submission format):

Submit a "a4_LastName_FirstName.zip" file that includes the following:

- A README.txt or README.pdf file. It should contain your name, ID, and CS machine used (Linux allv machines or Windows 10 lab machines). It should also contain the answers to all questions that require a written response. Please label each of your answers clearly with the question number and part for which they are a response.
- For all the programs you write, each program should be in a separate .pl file. Please name each program file using its question number and part. For example, the script written to test regexes against strings for the last part of question 1 should be in a file named "1f.pl".

Total Points: 70

Submission Instructions:

Assignments will be turned in through Blackboard. Make sure that your submission is correctly formatted before you turn it in, and that submission occurs before the deadline.

You can only submit twice. Only click "Submit" when you are sure you have followed all the submission requirements.

Late submissions will not be accepted. The due date is **11:55 PM, Friday, May 10.**