

UNIX and Shell Programming

Assignment 5: Filters

5 August 2019

1 Exercise 1

1. Launch a terminal.
2. Use the `cat` command to create a file containing the following data. Name it `Ch6S1F1`. Use tabs to separate the fields.

```
1425      Juan      14.25
4321      George   21.11
6781      Anna     16.77
1451      Ben      21.77
2277      Tuan     18.77
```

3. Use the `cat` command to display the file and check for accuracy.
4. Use the `vi` command to correct any errors in the file.
5. Use the `sort` command to sort the file `Ch6S1F1` according to the first field. Call the sorted file `Ch6S1F1` (same name).
6. Display the file `Ch6S1F1`.
7. Use the `cut` and `paste` commands to swap fields 2 and 3 of `Ch6S1F1`. Call it `Ch6S1F1`.
8. Display the file `Ch6S1F1`.
9. Quit the terminal.

2 Exercise 2

1. Launch a terminal.
2. Use the `tail` command to create and save the following file. Call it `Ch6S2F1`.

PASSES ALL DATA FROM INPUT TO OUTPUT
 PASSES ONLY SPECIFIED COLUMNS
 PASSES NUMBER OF SPECIFIED LINES AT BEGINNING
 COMBINES COLUMNS
 ARRANGES DATA IN SEQUENCE
 PASSES NUMBER OF SPECIFIED LINES AT THE END OF DATA
 TRANSLATES ONE OR MORE CHARACTERS
 DELETES DUPLICATE LINES
 COUNTS CHARACTERS} WORDS, OR' LINES
 ABCDEFGHIJKLMNOPQRSTUVWXYZ

3. Use the `cat` command to view its contents.
4. Use `vi` to correct any errors.
5. Encrypt this file using the following steps:
 - (a) Reverse the file line by line (the last line becomes the first, the line before the last line becomes the second, and so on).
 - (b) Call the file `Ch6S2F1Encr`.
6. Use the `cat` command to view its contents.
7. Display the file.
8. Decrypt the file (reverse the encryption steps). Call it `Ch6S2F1` (original name).
9. Display the file `Ch6S1F1`.
10. Quit the terminal.

3 Exercise 3

1. Launch a terminal.
2. Use the `cat` command to create and save the following file. Call it `Ch6S3F1`.

ALPHABETICAL FACTS.
 THE FIRST THREE LETTERS ARE ABC.
 THE MEDIAN LETTERS ARE MN.
 THE LAST THREE LETTERS ARE XYZ.
 THE FIRST WORD IN MY DICTIONARY IS AAL.
 THE LAST WORD IN MY DICTIONARY IS ZYTHUM.
 THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG.
 THE LAST LETTER MAY BE PRONOUNCED ZEE OR ZED.

```
THE FIRST GREEK LETTER IS ALPHA.  
THE LAST GREEK LETTER IS OMEGA.
```

3. Use the `cat` command to check the contents.
4. Use `vi` to correct any errors.
5. Display the file.
6. Using the `tr` command, encrypt this file by shifting each letter five characters to the end of the character set. For example, A becomes F, B becomes G, and soon. The end of the alphabet will wrap around. For example, Y becomes D and Z becomes E. Spaces and newlines would be preserved. This is called Caesarian encryption because it was invented by Julius Caesar. Call the encrypted file `Ch6S3F1Encr`.
7. Use the `cat` command to check the contents of the encrypted file.
8. Display the file.
9. Now use decryption (reverse strategy) to decrypt the file. Call the new file `Ch6S3F1` (original name).
10. Use the `cat` command to look at the contents of the file. Is it the same as the original file?
11. Display the file.
12. Quit the terminal.

4 Exercise 4

1. Launch a terminal.
2. Use the `cat` command to create and save the followingmg file. Do not type the headings. Call it `Ch6S4F1`.

```
ID      Hour Rate      Hours Worked  
1420 12.56    45 L  
3456 14.56    22  
2341 45.12    34  
1122 23.55    28  
1443 23.23    19  
2351 67.90    56  
8001 7.00     14
```

3. Use the `cat` command to check its contents.
4. Use `vi` to correct any errors.

5. Display the file.
6. Use a command to show the number of workers.
7. Use a command to sort the file based on id.
8. Use one single command to show the worker who is paid the highest hourly rate.
9. Use one single command to show the worker who worked more than anybody else.
The command should show only the id of the worker.
10. Quit the terminal.

5 Exercise 5

1. Launch a terminal.
2. Use the `cat` command to copy file `Ch6S4F1` and name it `Ch6S5F1`.
3. Use the `cat` command to create and save the following file. Do not type the headings.
Call it `Ch6S5F2`.

ID	Hourly Rate	Hours Worked
1420	12.56	45
2456	14.56	22
2341	45.12	34
1322	23.56	28
1443	23.23	19
2351	67.90	56
3467	56.90	14

4. Use the `cat` command to check the contents of both files.
5. Use `vi` to correct any errors.
6. Display both files.
7. Sort each file using the file id as the sort key. Save the sorted files as separate files.
8. Use a command to merge two files created in step 7 on the id field. Call the new file `Ch6S5F3`.
9. Use a command to remove the duplicate from the file and Save it without renaming it.
10. Display the file.
11. Quit the terminal.

6 Exercise 6

1. Launch a terminal.
2. Use the `cat` command to create and save the following file. Do not type the headings. Call it `C6S6F1`.

Department	Course	Session	Enrollment
CIS	15	1	45
CIS	54	1	20
BUS	34	2	20
ENG	11	2	89
CIS	45	1	38
MTH	35	1	56
MTH	35	2	41
PE	17	2	25
CIS	54	2	67

3. Use the `cat` command to check the contents of the file.
4. Use `vi` to correct any errors.
5. Display the file.
6. Use one command to sort the file on department course and session. The resulting file should be ordered first by department; within equal departments, it should be ordered on course; and within equal courses, it should be ordered by session. Hint: use three field specifiers: department, course, and session.
7. Display the file.
8. Quit the terminal.

7 Exercise 6

1. Launch a terminal.
2. Make a copy of `/etc /passwd` file and save it in a file called `Ch6S7F1`.
3. Use a command to count the number of users in this file. Make a note of it.
4. Cut the file so that each line has only two columns: login name (column 1) and user id (column 3). Call the new file `Ch6S7F2`.
5. Sort the file (`Ch6S7F2`) on login name without renaming it. Save the file.
6. Use the commands you have learned so far to reorganize the file `Ch6S7F2` into six columns using the following format:

```
Name id Name id Name id
```

Note that you should divide the number of users by three to find out the number of lines in this new format. You should create three files and then paste them together

7. Quit the terminal.