CSc 3320: Systems Programming

Spring 2021

Homework

1: Total points 100

Submission instructions:

1. Create a Google doc for each homework assignment submission. 2. Start your responses from page 2 of the document and copy these instructions on page 1.
3. Fill in your name, campus ID and panther # in the fields provided. If this information is missing in your document TWO POINTS WILL BE DEDUCTED per submission.
4. Keep this page 1 intact on all your submissions. If this *submissions instructions* page is missing in your submission TWO POINTS WILL BE DEDUCTED per submission.
5. Each homework will typically have 2-3 PARTS, where each PART focuses on specific topic(s).
6. Start your responses to each PART on a new page.
7. If you are being asked to write code copy the code into a separate txt file and submit that as well.
8. If you are being asked to test code or run specific commands or scripts, provide the evidence of your outputs through a screenshot and copy the same into the document.
9. Upon completion, download a .PDF version of the document and submit the same.

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Campus ID: Kguchu1

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PART 1

Answer the following questions briefly. Provide clear and succinct reasoning.

Points per question = 5

1. Tell the differences between Unix and Linux. Then please list some operating systems (at least three) which belong to Unix but not Linux.

Unix is a popular package operating system equipped with various utilities, it is not open sourced and contains a completely different coding language from linux. Linux is a sub-variety of Unix however it does not contain the same coding language, it functions as a kernel/shell and is open source.

Unix- System V(AT&T), BSD(Berkeley Standard Distribution), Apple OS/X , Sun Java Desktop & Solarias

2. What is the pipe mechanism in UNIX? And show one command using pipe and explain how the pipe works in it?

The pipe mechanism allows us to use the (|) as a function to use the output of one process as the input of another process.

Example $ cat Homework.txt | sort

The cat process will show the contents of the Homework.txt file, and that output will be piped to the sort process which will return the contents of the homework.txt file in a sorted order

3. In a Linux system, you can issue the command **ls /** to check the sub directories under root. Please describe the meanings of directory /bin, /dev, /boot, /usr, /etc, /mnt, /sbin, /var separately. For example, you can say that /bin contains binary executable files.

/bin - contains executable binary programs including all the simple processes

/dev - contains device files.

/boot - Contains Kernel / Boot loader files

/usr - contains user installed software and utilities. Also contains subdirectories ex. /usr/public

/etc - contains core systems configuration directory

/mnt - contains temporarily mounted file systems

/sbin - contains essential system binaries

/var - contains variable directory

4. What is the meaning of Multitask and Multi-user in a Unix system?

- Multitasking in unix means the system is able to run multiple programs simultaneously
- Multi-user is the ability for multiple users to work at a given time by using distributed computing systems and shared processing time

5. What does -rwxr-xr-x mean in terms of permissions for a file? What is the exact unix command (with the octal representation) for changing the permissions to this setting?

-rwx r-x r-x - The permissions of this file state that the user has the ability to read, write, and execute the file. A group has the ability to Read and Execute the file but not write, as well, all others can read and execute the file but not write.

rwx	r-x	r-x
111	101	101
7	5	5

Chmod 755 Example.file

6. In class, you have learned the meaning of read, write and execute permission for regular files. However, these permissions are also applied to directories. So please describe the meaning of read, write, and execute permission for directory.

Read - lets users see the contents of a directory

Write - allows user to create/delete files within the directories Execute -

allows user to enter the directory ie. make it there main directory

Part II-a

Regular Expression
Find outcomes for each given basic/extended regular expression (maybe multiple correct answers)

Points per question: 2.5

Example:
'ab+a' (*extended regex*)

***Answer**: aba , abba ; Pattern : The matched string should begin and end with 'a' and 'b' occurs at least once between leading and ending 'a')*

Note: 7) to 10) are basic regexes; Note: 11) to 18) are extended regexes.

7) 'a[ab]*a' -

aa , aaba ; Pattern: matched string will begin and end with any/if any characters between the range of "a-b" (a,b,ab)

8) 'a(bc)?' -

a,abc ; Pattern: matched string will begin with a and contain bc, zero or more times.

9) '.[ind]*' -

Qd, Q,n, Qindd ; Pattern: the matched string will start with anything other than a new line and will contain zero or more of any combination of the characters i, n, and d.

10) '[a-z]+[a-z]'

agcv, ahs, ah, hd: Pattern: the matched string will begin and end with a letter of the from a-z and contain any letters from a-z between.

11) '[a-z] (\+[a-z])+'

D+c, r+v+d+s, t+t: Pattern: matched string will start with letter

"a-z" and contains a "+" followed by another character of "a-z"

12) 'a.[bc]+'

abc, ahcb, albc: Pattern: matched string will start with "a" and

then any character that is not a newline followed by zero or more

of the characters b & c at the end.

13) 'a.[0-9]'

au3 , ay8 Pattern: the matched string will start with a, followed

by any character that is not a new line, and ending with a number

0-9

14) '[a-z]+[\.\?!]'

F. , qrs? Pattern: the matched string will begin with any character

a-z and end with a special character . , ?, or !

15) '[a-z]+[\.\?!]\s*[A-Z]'

y. Y , hg!W Pattern: the matched string will begin with a letter

a-z followed by a special character . , !, ? , followed by zero or

more spaces, and ending in a capital letter A-Z.

16) '(very)+(cool)?(good|bad) weather'

Verycoolgood weather or Verycoolbad weather Pattern: the

matched string will contain one or more of the words "very, cool ,

followed by the word good or bad and ending in weather.

17) '-?[0-9]+'
-33, 4 Pattern: The matched string will start with zero or more negative signs(-), followed by one or more of any digit "0-9"

18) '-?[0-9]*\.?[0-9]*'

-7Y0, 7Y7
The matched string will start with zero or more negative signs(-), followed by one or more number 0-9 followed by zero or more (.), and end with zero or more number 0-9

Part II-b

Regular Expression
Write down the extended regular expression for following questions.
E.g. Social security number in the format of 999-99-9999. Answer: [0-9]{3}-[0-9]{2}-[0-9]{4}

Points per question: 5

19) Valid URL beginning with "http://" and ending with ".edu" (e.g.

http://cs.gsu.edu, http://gsu.edu)

“(http://)\/\/[\w\-_]+(\.[\w\-_]+)+(\w\-\.]*+(edu)?

20) Non-negative integers. (e.g. 0, +1, 3320)
‘(([0-9][0-9])*|0)’

21) A valid absolute pathname in Unix (e.g. /home/ylong4, /test/try.c)

([.\/]+[a-z]*)*

22) Identifiers which can be between 1 and 10 characters long, must start with a letter or an underscore. The following characters can be letters or underscores or digits. (e.g. number, _name1, isOK).

[_|a-z]{10}

23) Phone number in any of the following format: 9999999999,999-999-9999, (999)-999-9999. (Note: all of these formats should be matched by a single regular expression)

[0-9]{10} ,

[0-9]{3}-[0-9]{3}-[0-9]{4} ,

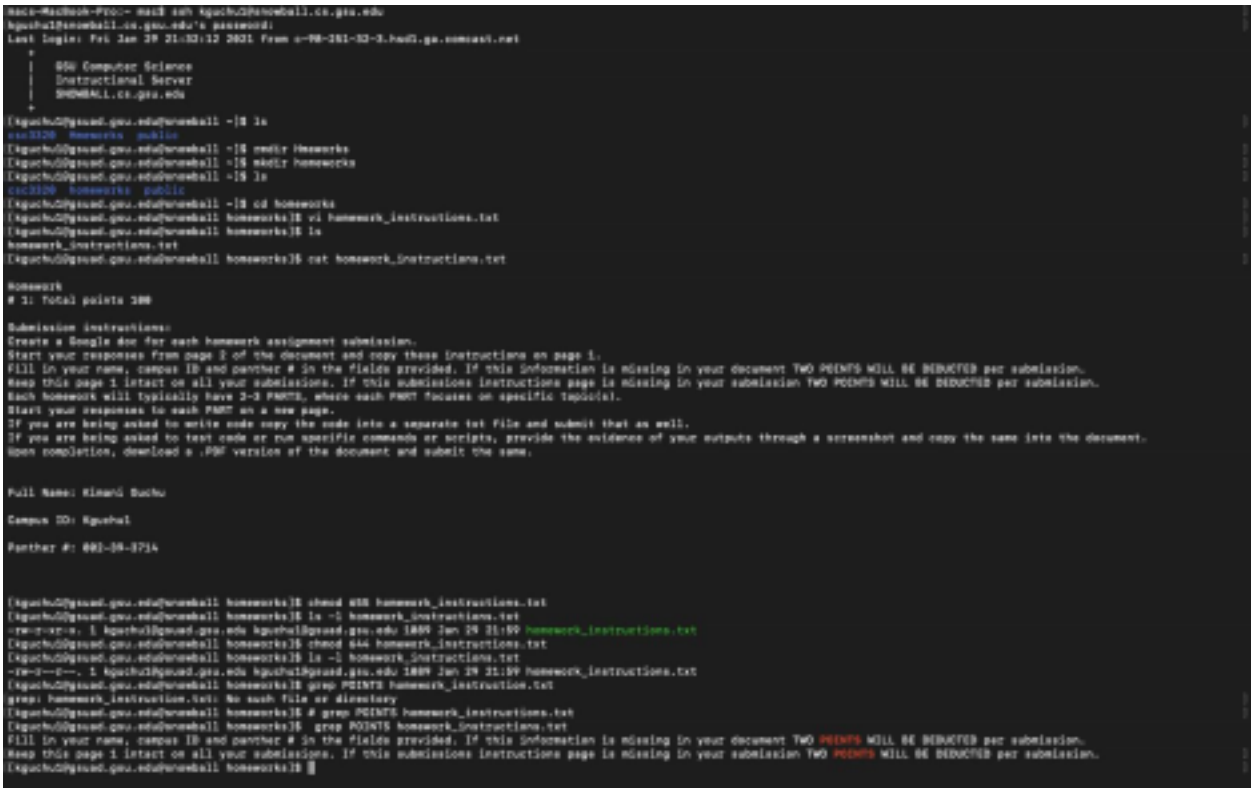
([0-9]{3})-[0-9]{3}-[0-9]{4}

Part III
Programming
Points per question: 15
24. Create a file named homework_instructions.txt using VI editor and type in

it all the submission instructions from page1 of this document. Save the file in a directory named *homeworks* that you would have created. Set the permissions for this file such that only you can edit the file while anybody can only read. Find and list (on the command prompt) all the statements that contain the word POINTS. Submit your answer as a description of what you did in a sequential manner (e.g. Step1 … Step 2… and so on..). Add a screenshot to your answer as a proof of evidence.

1. Mkdir homework - created our directory
2. cd homeworks - access our homework directory
3. vi homework_instructions.txt - open our vi editor
4. **Copy contents of assignment instructions**
5. :wp - to write and save our completed vi file
6. :x -to exit the file
7. Cat homework_instructions.txt - preview contents of our created text file
8. Chmod 644 homework_instructions.txt - update file permissions as stated.
9. ls -l homework_instructions.txt - verify permissions are correct 10. # grep POINTS homework_instructions.txt - returns all statements that contain the phrase “POINTS”

Returns - Fill in your name, campus ID and panther # in the fields provided. If this information is missing in your document TWO **POINTS** WILL BE DEDUCTED per submission. Keep this page 1 intact on all your submissions. If this submissions instructions page is missing in your submission TWO **POINTS** WILL BE DEDUCTED per submission.


kasis-MacBook-Pro:~ kasi$ ssh kguchu2@snowball.cs.gsu.edu
kguchu2@snowball.cs.gsu.edu's password:
Last login: Fri Jan 29 21:32:12 2021 from c-98-161-52-3.hsd1.ga.comcast.net
CSU Computer Science
Instructional Server
SNOWBALL.cs.gsu.edu
[kguchu2@gsuad.gsu.edu@snowball ~]$ ls
csc3320 Homeworks public
[kguchu2@gsuad.gsu.edu@snowball ~]$ rmdir Hmeworks
[kguchu2@gsuad.gsu.edu@snowball ~]$ mkdir homeworks
[kguchu2@gsuad.gsu.edu@snowball ~]$ ls
csc3320 homeworks public
[kguchu2@gsuad.gsu.edu@snowball ~]$ cd homeworks
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ vi homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ ls
homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ cat homework_instructions.txt
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Full Name: Kisardi Buchu
Campus ID: Kguchu2
Panther #: 001-39-3714
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ chmod 655 homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ ls -l homework_instructions.txt
-rw-r-xr-x. 1 kguchu2@gsuad.gsu.edu kguchu2@gsuad.gsu.edu 1889 Jan 29 21:09 homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ chmod 644 homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ ls -l homework_instructions.txt
-rw-r--r--. 1 kguchu2@gsuad.gsu.edu kguchu2@gsuad.gsu.edu 1889 Jan 29 21:09 homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ grep POINTS homework_instruction.txt
grep: homework_instruction.txt: No such file or directory
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ # grep POINTS homework_instructions.txt
[kguchu2@gsuad.gsu.edu@snowball homeworks]$ grep POINTS homework_instructions.txt
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[kguchu2@gsuad.gsu.edu@snowball homeworks]$