**CSc 3320: Systems Programming**

Fall 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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**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.

Linux is an open-source code where it’s stored in a public repository, Linux can be installed in any type of CPU hardware’s, and Unix is not a open source code and Unix cannot be downloaded anywhere only specific places like Solaris, AIX, and mac.

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 is way to combine two or more commands together or also information. An example would be “grep ‘TST 4| TST 1’ TST\_Course.txt in this example grep command is to filter a search and with the pipe command, it allows me to filter what I’m searching for in a file.

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 binary executable files

/dev location of a special or device files

/boot contains the files where to boot the operating system

/usr home of the user directory

/etc contains system that configures the files or sub directory

/mnt it contains a sub directory for individual devices

/sbin standard sub directory of the directory where it also contains files

/var root of the directory of sub directory, in unix it differs it contains files where the system writes the data in the file

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

Multitask is a operating system that supports two or more processors to run at the same time. Multiuser is a operating system allows two or more user to run programs at the same 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?

The command makes the user read and then write the executed permission. Then the group can read and execute the octal representation.

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.

When the user has permission to read which means to open the file and view the content, write is the part where only the user who made the file has permission to edit whatever is on the file. Last is to execute meaning to run the file.

**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, aaa, aba, aaba

8) ‘a(bc)?’ = a, abc

9) ‘.[ind]\*’ = mi, t, tn, td, ti, miidn

10) ‘[a-z]+[a-z]’ = abcd, avc, ad

11) ‘[a-z] (\+[a-z])+’ = a+b, a+b+b

12) ‘a.[bc]+’ = abb, atbc, aucb

13) ‘a.[0-9]’ = at0, ar9

14) ‘[a-z]+[\.\?!]’ = a., abcd?, az!

15) ‘[a-z]+[\.\?!]\s\*[A-Z]’ a. A, abc! Z, abcds?B

16) ‘(very )+(cool )?(good|bad) weather’ verycoolgood weather, veryverybad weather

17) ‘-?[0-9]+’ 9, -2, -345,454

18) ‘-?[0-9]\*\.?[0-9]\*’ ‘’,-0t9, -y, 9u9

**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)

(([1-9][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]{2}-[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.

Step 1: Make a directory called Homeworks and then change the directory to homeworks

Graphical user interface, text

Description automatically generated

Step 2 : Create a file named homework\_instructions.txt

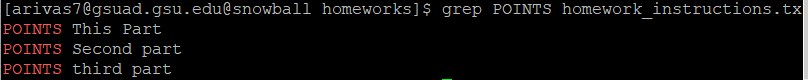


Step 3: Edit the file

Text

Description automatically generated

Step 4: After Creating file search for POINTS only by using grep command



Step 5: Make the file so only they can read, write, and execute and for other people read and execute and only you can write

