**CSC3320 System Level Programming**

**Homework 1**

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Due at 11:59 pm on Wednesday Feb.1st, 2023

Part I: Answer the following questions

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 OS built off of the Unix Os. Apple OS, BSD, Sun Java.

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

Using output of one program as input of another.

$ who | sort

Who activates and gets an output and puts it inside of sort.

3. In a Linux system, you can issue the command ls / to check the subdirectories 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 reveals executable. /dev reveals special.ls ./boot directory stores data. /usr sharable read onlys. /etc has all configuration./mnt mount point. /sbin system binaries executables. /var standard sub directory.

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

Multitask means multiple operations running at the same time. Multi-user is each user having a different terminal and all connected to the HOST COMPUTER

5. What does GNU stand for? What is the GNU project? Which organization funded the development of GNU project?

GNU’s Not Unix. Os that can be its own or with other Oss and is a lot of free softwares. Free Software Foundation.

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

It means that they can read(see) the directory, create files in it, or enter it respectively.

Part II: Regular Expression

1. Chose match(es) for each given basic/extended regular expression (maybe multiple correct matches) and describe the pattern of matched string for 3), 4), 5), 6), 11).

|  |
| --- |
| e.g. ‘ab+a’ （extended regex）  a) ababa b) aba c)abba d)aabbaa e)aa  Answer: b,c ; Pattern : The matched string should begin and end with ‘a’ and ‘b’ occurs at least once between leading and ending ‘a’) |

Note: 1) to 5) are basic regexes;

1) ‘a[ab]\*a’

(a)ababa (b) aaba (c) aabab (d) aabbaa (e)aa

A,b,d,e

2) ‘a(bc)?’

(a) abc (b) a(bc)? (c) a(bc (d) a (e) abcbc

A

3) ‘.[ind]\*’

(a) wind (b) window (c) end (d) good (e)will

Abcde

4) ‘[a-z]+[a-z]’

(a) a+b+c (b) +b (c) x (d) x+1 (e) x+a

Note: 5) to 12) are extended regexes.

none

5) ‘[a-z] (\+[a-z])+’

(a) a+b+c (b) +b (c) x (d) x+1 (e) x+a

none

6) ‘a.[bc]+’

(a)azbc (b) az (c) azbcbc (d) acc (e)acz

A,c,d

7) ‘a.[0-9]’

(a)azz (b) a0z (c) a01 (d) a0a (e)aza

c

8) ‘[a-z]+[\.\?!]’

(a)good! (b) Book. (c) hard? (d) cool?hot (e)nothing

A,C

9) ‘[a-z]+[\.\?!]\s\*[A-Z]’ (hint: \s matches any whitespace characters)

(a)Grade. A (b) book. Z (c) E. G (d) Level. a (e)index?a

10) ‘(very )+(cool )?(good|bad) weather’

(a)good weather (b) very good weather (c) cool weather

(d) very cool bad weather (e)cool good weather

11) ‘-?[0-9]+’

(a) 3312 (b) -2231 (c) +32 (d) 0.5 (e)2/3

12) ‘-?[0-9]\*\.?[0-9]\*’

(a) 3312 (b) -2231 (c) +32 (d) 0.5 (e)2/3

2. 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}

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

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

2) Non-negative integers. (e.g. 0, +1, 3320)

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

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

5) Phone number in any of the following format: 9999999999,999-9999999, (999)-999-9999. (Note: all of these formats should be matched by a single regular expression)

Submission:

• Upload an electronic copy (MS word or pdf) of your answer sheet.

• Please add the homework number and your name at the top of your answer sheet.

• Please write down your answers with the question number only in the answer sheet.

• Name your file in the format of HW1\_FisrtnameLastname (eg.

HW1\_PengWang.docx, HW1\_PengWang.pdf)