CSc 3320: Systems Programming

Fall 2021

Midterm 1: Total points = 100

Submission instructions:

1. Create a Google doc for your 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 TWO POINTS WILL BE DEDUCTED.
4. Keep this page 1 intact. If this *submissions instructions* page is missing in your submission TWO POINTS WILL BE DEDUCTED.
5. Start your responses to each QUESTION on a new page.
6. If you are being asked to write code copy the code into a separate txt file and submit that as well. The code should be executable. E.g. if asked for a C program then provide myfile.c so that we can execute that script. In your answer to the specific question, provide the steps on how to execute your file (like a ReadMe).
7. If you are being asked to test code or run specific commands or scripts, provide the evidence of your outputs through a screenshot and/or screen video-recordings and copy the same into the document.
8. Upon completion, download a .PDF version of the google doc document and submit the same along with all the supplementary files (videos, pictures, scripts etc).
9. Scripts/Code without proper comments, indentation and titles (must have the name of the program, and name & email of the programmer on top the script).

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Questions 1-5 are 20pts each

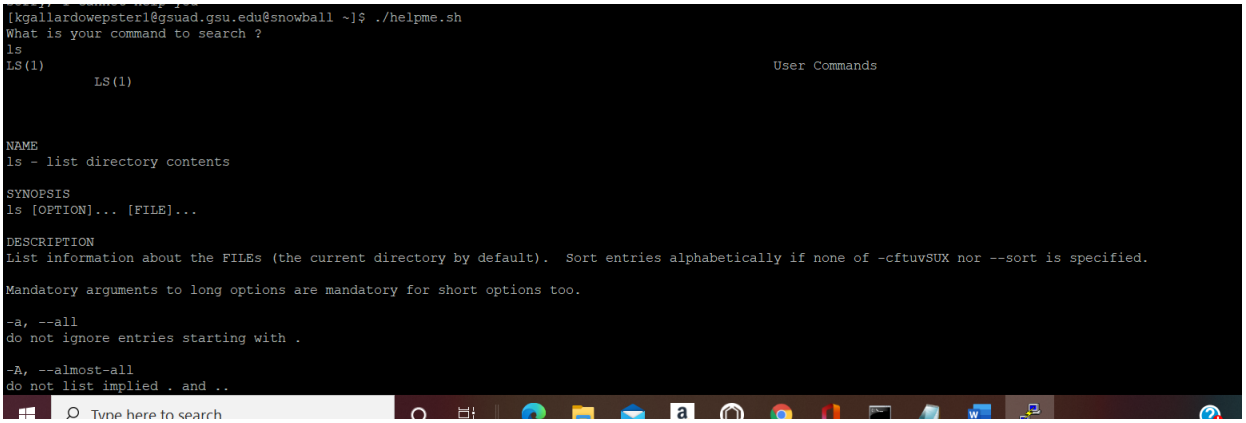
1. (20 pts) Pick any of your 10 favourite unix commands. For each command run the *man* command and copy the text that is printed into a mandatabase.txt. Write a shell script *helpme.sh* that will ask the user to type in a command and then print the manual's text associated with that corresponding command. If the command the user types is not in the database then the script must print *sorry, I cannot help you*

   Step 1) chmod +755 madatabase.txt

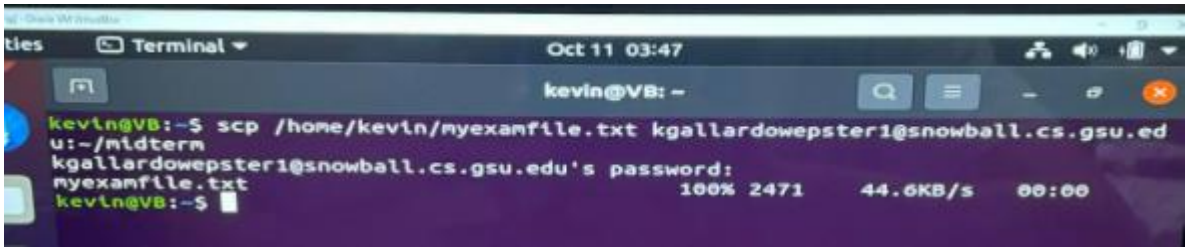
   step 2) chmod +755 helpme.sh

   Step 3) ./helpme.sh

   step 4) ls



2. (10pts each) On your computer open your favourite Wikipedia page. Copy the text from that page into a text file **myexamfile.txt** and then copy that file to a directory named **midterm** (use mkdir to create the directory if it doesn't exist) in your snowball server home directory (use any FTP tool such as Putty or Filezilla to copy the file from your computer to the remote snowball server machine: see Lab 6).



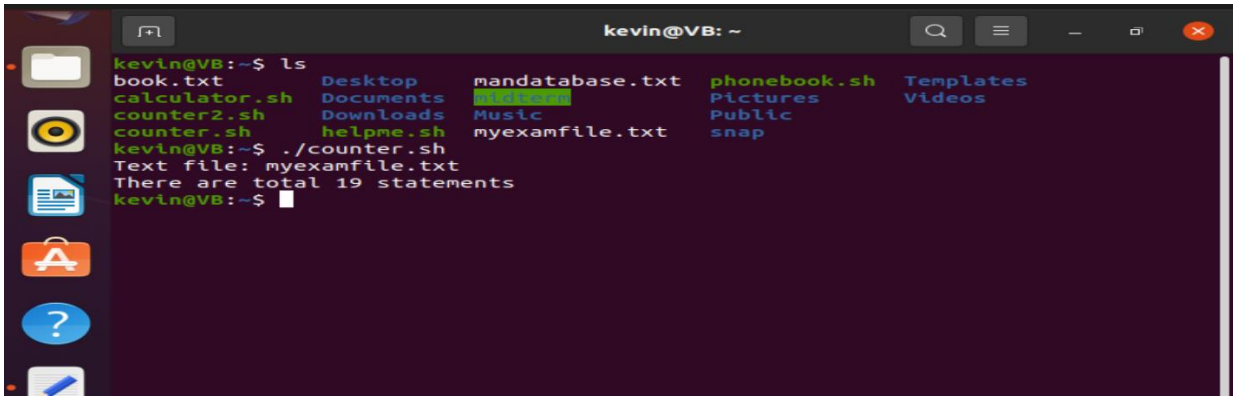
a. Write a shell script that will find the number of statements in the text. A statement is defined as the collection of text between two periods (full-stops).

Step 1) chmod +755 myexamfile.txt

Step 2) chmod +755 counter.sh

Step 3) ./counter.sh

Step 4) myexamfile.txt

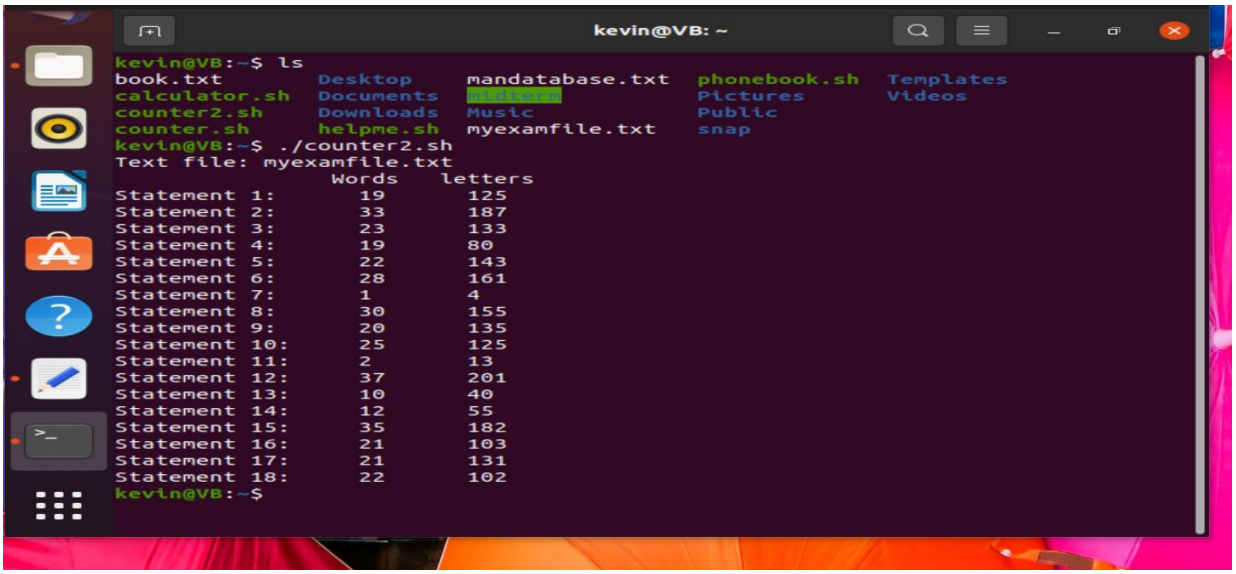


b. Update the script to present a tabular list that shows the number of words and number of letters in each statement.

Step 1) chmod +755 counter2.sh

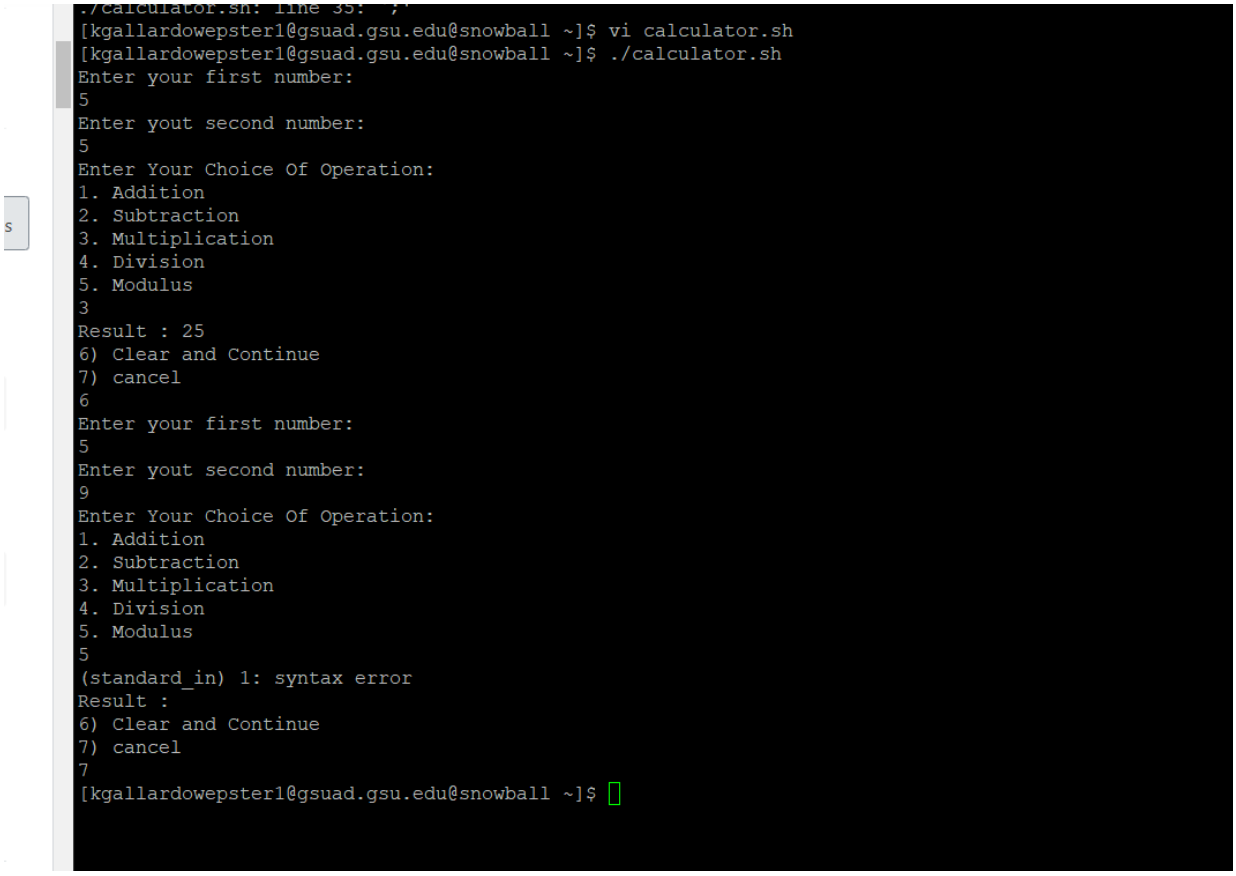
Step 2) ./counter.sh

Step 3) myexamfile.txt



3. (20pts) Design a calculator using a shell script using regular expressions. The calculator, at the minimum, must be able to process addition, subtraction, multiplication, division and modulo operations. It must also have cancel and clear features.

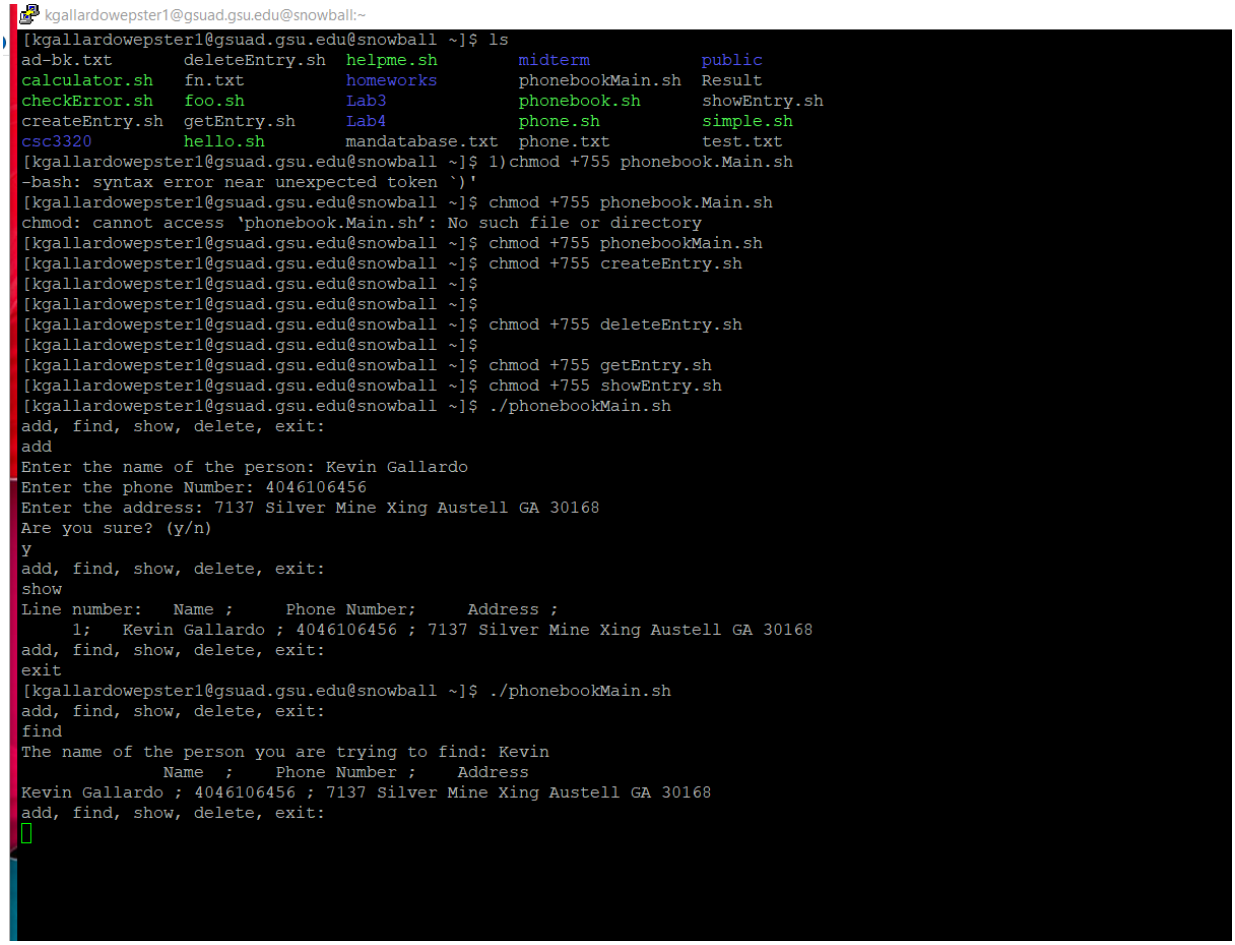
1) ./calculator.sh
2) 8
3) 9
4) 4
5) 7



4. (20pts) Build a phone-book utility that allows you to access and modify an alphabetical list of names, addresses and telephone numbers. Use utilities such as awk and sed, to maintain and edit the file of phone-book information. The user (in this case, you) must be able to read, edit, and delete the phone book contents. The permissions for the phone book database must be such that it is inaccessible to anybody other than you (the user).

Create all the sh files in the home directort (~) in order for the path of each shell to be called correctly by phonebook.Main.sh

1) chmod +755 phonebookMain.sh
2) chmod +755 createEntry.sh
3) chmod +755 deleteEntry.sh
4) chmod +755 getEntry.sh
5) chmod +755 showEntry.sh
6) ./ phonebookMain.sh
7) add
8) Kevin Gallardo
9) 4046106456
10) 7137 Silver Mine Xing Austell GA 30168
11) Y
12) show
13) find
14) Kevin
15) exit


kgallardowepster1@gsuad.gsu.edu@snowball:~
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ ls
ad-bk.txt deleteEntry.sh helpme.sh midterm public
calculator.sh fn.txt homeworks phonebookMain.sh Result
checkError.sh foo.sh Lab3 phonebook.sh showEntry.sh
createEntry.sh getEntry.sh Lab4 phone.sh simple.sh
csc3320 hello.sh mandatabase.txt phone.txt test.txt
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ 1)chmod +755 phonebook.Main.sh
-bash: syntax error near unexpected token `)'
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ chmod +755 phonebook.Main.sh
chmod: cannot access 'phonebook.Main.sh': No such file or directory
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ chmod +755 phonebookMain.sh
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ chmod +755 createEntry.sh
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ chmod +755 deleteEntry.sh
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ chmod +755 getEntry.sh
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ chmod +755 showEntry.sh
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ ./phonebookMain.sh
add, find, show, delete, exit:
add
Enter the name of the person: Kevin Gallardo
Enter the phone Number: 4046106456
Enter the address: 7137 Silver Mine Xing Austell GA 30168
Are you sure? (y/n)
y
add, find, show, delete, exit:
show
Line number: Name ; Phone Number; Address ;
1; Kevin Gallardo ; 4046106456 ; 7137 Silver Mine Xing Austell GA 30168
add, find, show, delete, exit:
exit
[kgallardowepster1@gsuad.gsu.edu@snowball ~]$ ./phonebookMain.sh
add, find, show, delete, exit:
find
The name of the person you are trying to find: Kevin
Name ; Phone Number ; Address
Kevin Gallardo ; 4046106456 ; 7137 Silver Mine Xing Austell GA 30168
add, find, show, delete, exit:

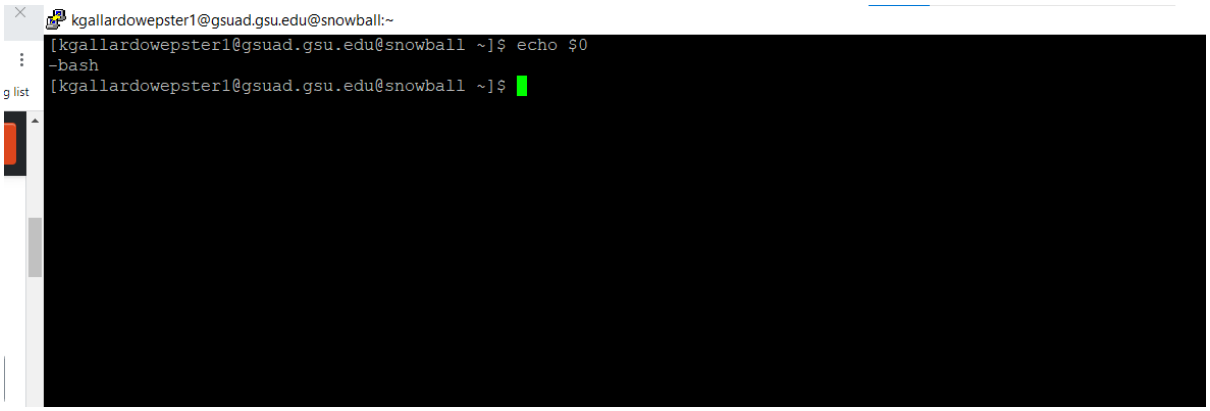
5. (4 pts each) Give brief answers with examples, wherever relevant

A. What is the use of a shell?

It interprets commands for meaning received from standard input or command line argument or redirected standard output. Those commands are translated in order to interact with the system.

B. Is there any difference between the shell that you see on your PC versus that you see on the snowball server upon login? If yes, what are they? Provide screenshots for examples.

Both the server and my virtual machine running Ubuntu have the same shell. There is no difference between them.



C. What are the elements in a computer (software and hardware) that enable the understanding and interpretation of a C program?

Software would be the compiler that converts a C program into machine code and the CPU would be the hardware that carries out the machine code.

D. The “printf()” C command is used for printing anything on the screen. In bash we use the command “echo ”. What is the difference (if any) in terms of how the computer interprets and executes these commands?

The command echo has a built in newline character whereas the command printf() it is added manually.

E. What do these shell commands do? “ssh”, “scp” and “wget”. Describe briefly using an example that you have executed using the snowball server.

Ssh is a secured shell and it’s used to connect two systems. In the snow server we always connect using Ssh and then give out username and password. This enables the user to execute commands remotely.

Scp allows you to copy a file to a remote server from your computer. One example is during this midterm where we had to send a file that we made in our computer to out snowball server account.

Wget is a command used to download files from the Web. One example is when the download link to the assignment about real estate properties was working I used wget to download the file form the source website.