**Homework:02 CS 646**

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***1.[Linux Operating System] free is a command that displays used and available memory in your system. Read man page of free command. Run the command free –o several times, running other programs in between, and store the results in a file. Draw a graph as follows: X-axis: MB-used; for the Y-axis, use (i) Memory Used per unit time; (ii) (Memory Used – Memory Buffered –Memory Cached) per unit time; and (3) Swap Used per unit time. Explain the behavior of this graph with respect to memory utilization in the presence of running various applications.***

Man page of free command:

Text

Description automatically generated

In my computer free-o command does not work so I have done the same task using only free command.

Execution of free command:

A screenshot of a computer

Description automatically generated

Executing free command 10 times at a constant time interval (10 seconds) running other programs in between:

A screenshot of a computer

Description automatically generated with medium confidence

Table

Description automatically generated

***3. [Linux Operating System] df is a command that displays the amount of disk space available on the file system containing each file name argument. Read man page of df command. Run the command df to find out how many disk blocks are available and how many are in use. Does the sum of these equals the total number of disk blocks on the disk? If not, explain why there is a difference. Next run the command df –i to find out how many i-nodes are available and in use. Now create a new file with just a few characters in it, and again run df and df –i commands. Explain the effect of creating this new file. Now increase the size of this new file by entering a large number (> 5000) of characters, and again run df and df –i commands. Explain the effect of increasing the size of the new file.***

Man page of df command :

Text

Description automatically generated

Execution of df Command:

Graphical user interface, text

Description automatically generated



The underlined numbers under “Available” column are the available disk sizes of the file system. The other non-underlined disk sizes are already 100 % used.

Execution of df-i command:

Graphical user interface, text

Description automatically generated



In the above diagram the total number of I nodes are shown under the column of Inodes. The underlined numbers under the ‘Ifree’ colume are the Inodes which are available, the used I nodes are shown under the Iused column.



df and df-I command execution after creating a new file with just a few characters in it:

Text

Description automatically generated



Changes in available disk space is underlined in df command after few characters.

df and df-I command execution after a increasing character size over 5000:

Text

Description automatically generated



Changes in available disk space is underlined in df and df-I command after increasing the number of characters to over 5000.

***4[Programming Problem] Write a program that starts at a given directory and descends the file tree from that point, recording the sizes of all the files it finds. When the traversal is complete, the program should print a histogram of the file sizes using a bin width specified as a parameter into the program (e.g., with 1024, file sizes of 0 to 1023 to in one bin, 1024 to 2047 go in the next, etc.***

Execution of code:

A screenshot of a computer

Description automatically generated with medium confidence