

NSSA-220 Task Automation Using Interpretive Languages Lab 1: Linux Commands

INSTRUCTIONS

For the lab, complete the required tasks. Additionally, review the *submission document* for the mandatory screenshots and the grading rubric. You must provide screenshots from the terminal that includes the commands and relevant output to validate the completion of each task. The lab should be completed and submitted individually, but feel free to work with other classmates and ask for help from your instructor and the teaching assistant as needed. The "official" due date for each assignment will be posted to myCourses. When complete, submit the document to the assignment section in myCourses.

PREPARATION

- Read through this document
- Attend Lecture and take notes
- Review the reading assignments

ACTIVITY SUMMARY

Activity 1 – Modify your shell prompt

Activity 2 – Linux Command One Liner

Activity 3 – Parsing File Information

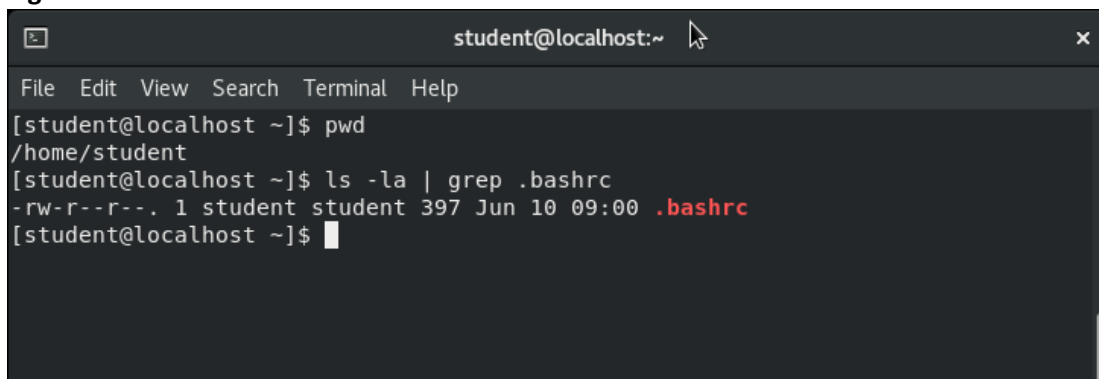
ACTIVITIES

Activity 1 – Configure the Shell Prompt

For this activity, the `.bashrc` file will be edited to show your RIT ID. Throughout the labs, you will be providing screenshots to verify that the activity/task has been completed, and the screenshot must show your RIT ID to receive credit. The file is located in the student home directory or `/home/student` (see Figure 1). To change the prompt, open a Terminal and using an editor of your choice (vim is recommended), add the following line under "*User specific aliases and functions,*" in the "`.bashrc`" file (see Figure 2). Please note the spacing and use of single quotes.

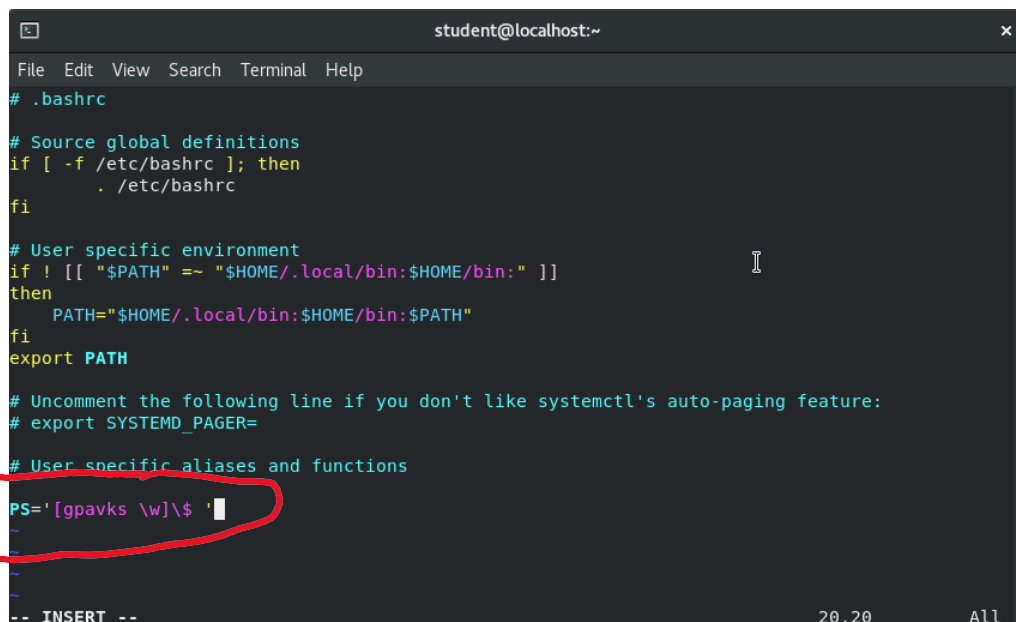
PS1 = '[yourID \w]\\$ '

Figure 1 – Location of `.bashrc` File



```
student@localhost:~  
File Edit View Search Terminal Help  
[student@localhost ~]$ pwd  
/home/student  
[student@localhost ~]$ ls -la | grep .bashrc  
-rw-r--r--. 1 student student 397 Jun 10 09:00 .bashrc  
[student@localhost ~]$
```

Figure 2 – Edited File



```

student@localhost:~
File Edit View Search Terminal Help
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
    . /etc/bashrc
fi

# User specific environment
if ! [[ "$PATH" =~ "$HOME/.local/bin:$HOME/bin:" ]]
then
    PATH="$HOME/.local/bin:$HOME/bin:$PATH"
fi
export PATH

# Uncomment the following line if you don't like systemctl's auto-paging feature:
# export SYSTEMD_PAGER=

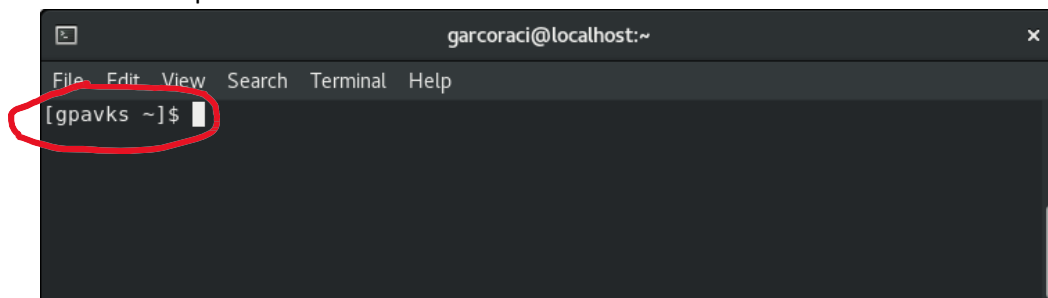
# User specific aliases and functions

PS=[gpavks \w]\$
-- INSERT --
20,20 All

```

Please note that you will need to exit the terminal and open a new instance for the change to take effect, your prompt should look similar to Figure 3.

Figure 3 – New Prompt



```

garcoraci@localhost:~
File Edit View Search Terminal Help
[gpavks ~]$

```

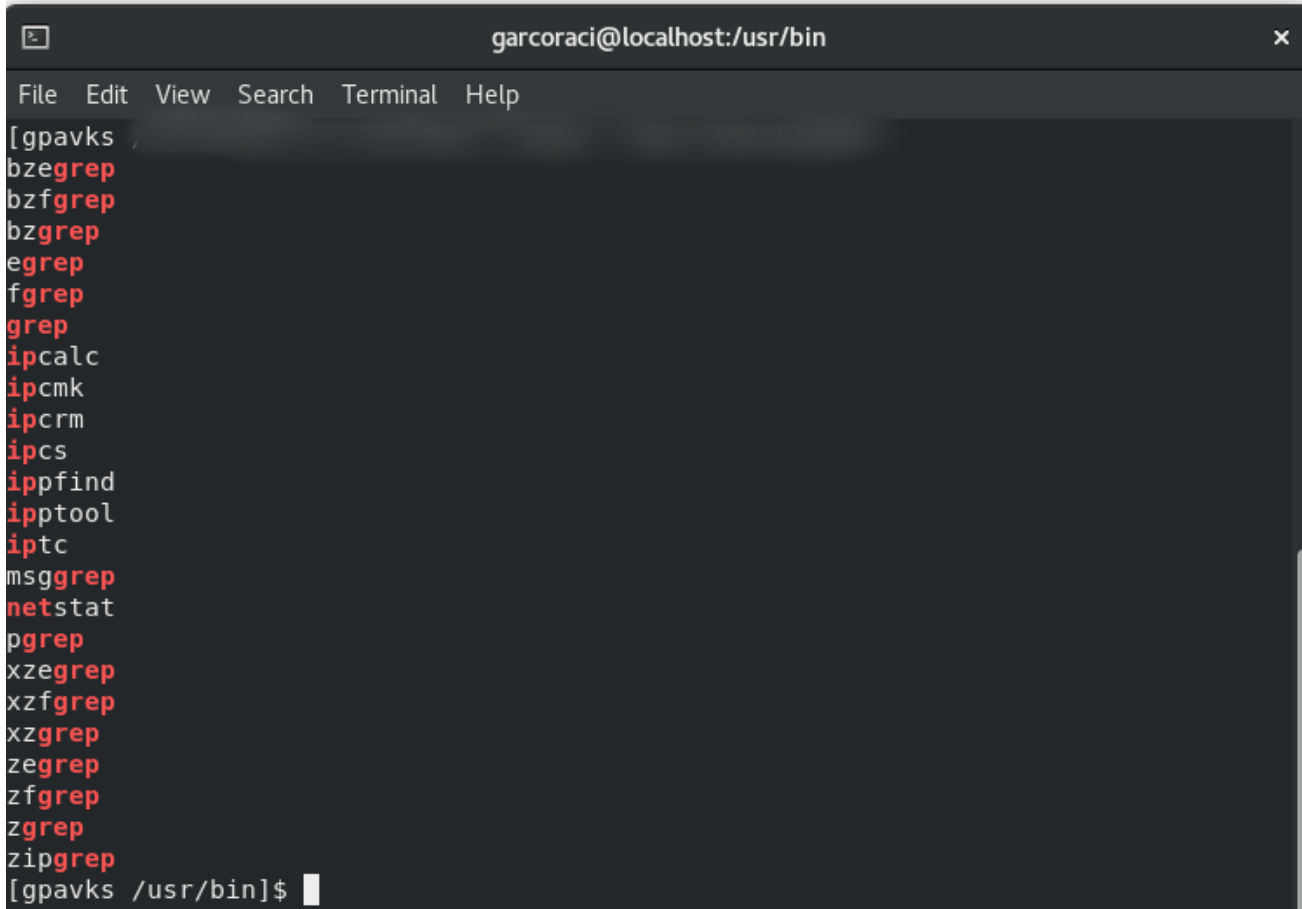
Activity 2 –Linux Command One-liners

For this activity, you will be performing a series of tasks. For each task, include a screenshot that clearly shows the command or commands you used to accomplish it. The screenshot must show your username the prompt. Figure 4 provides a sample of the output (obviously, the command used is blurred); your output may differ depending on the CentOS version. Regardless, the output should only show files starting with 'ip' and 'net' or ending with 'grep.'

Task 1

Write a single command that outputs a list of all files in /usr/bin that begin with "ip", and "net", or end with "grep". Hint: when using a \$ in a regex, the \$ comes *after* the string you want to match at the end of line.

Figure 4 – Sample Output from Command



```
garcoraci@localhost:/usr/bin
File Edit View Search Terminal Help
[gpavks /usr/bin]$ ls
bzegrep  bzfgrep  bzgrep   egrep    fgrep    grep     ipcalc   ipcmk    ipcrm    ipcs     ipfind   iptool   iptc     msggrep  netstat  pgrep    xzegrep  xzfgrep  xzgrep   zegrep   zfgrep   zgrep    zipgrep
[gpavks /usr/bin]$
```

Task 2

This task will require two commands. The first command will output a list of all subdirectories in the `/etc` directory that a standard user *cannot* access (i.e., they are denied permission). The command's output needs to be redirected to a file called `'output.log.'` Next, use the `cut` command to show the absolute path of the subdirectories without any special characters like the colon. See the output below for a sample of the expected output and format. Include a screenshot of `output.log` file using the `cat` command.

Figure 5 – Sample Output for Task 2

```

garcoraci@localhost:~
File Edit View Search Terminal Help
[gpavks ~]$ ls /etc
/etc/audit
/etc/cups/ssl
/etc/dhcp
/etc/firewalld
/etc/grub.d
/etc/libvirt
/etc/lvm/archive
/etc/lvm/backup
/etc/lvm/cache
/etc/nftables
/etc/pki/rsyslog
/etc/polkit-1/localauthority
/etc/polkit-1/rules.d
/etc/sss
/etc/sudoers.d
[gpavks ~]$
  
```

Figure 6 – Contents of the “output.log” File

```

garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$ cat output.log
ls: cannot open directory '/etc/audit': Permission denied
ls: cannot open directory '/etc/cups/ssl': Permission denied
ls: cannot open directory '/etc/dhcp': Permission denied
ls: cannot open directory '/etc/firewalld': Permission denied
ls: cannot open directory '/etc/grub.d': Permission denied
ls: cannot open directory '/etc/libvirt': Permission denied
ls: cannot open directory '/etc/lvm/archive': Permission denied
ls: cannot open directory '/etc/lvm/backup': Permission denied
ls: cannot open directory '/etc/lvm/cache': Permission denied
ls: cannot open directory '/etc/nftables': Permission denied
ls: cannot open directory '/etc/pki/rsyslog': Permission denied
ls: cannot open directory '/etc/polkit-1/localauthority': Permission denied
ls: cannot open directory '/etc/polkit-1/rules.d': Permission denied
ls: cannot open directory '/etc/sss': Permission denied
ls: cannot open directory '/etc/sudoers.d': Permission denied
[gpavks ~/Lab01]$
  
```

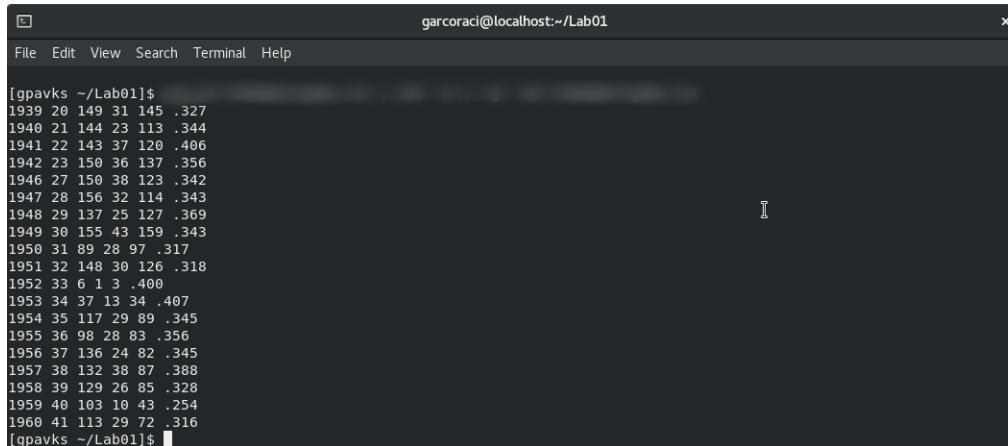
Ted Williams was a baseball player who played Major League Baseball for 19 seasons between 1939 and 1960 and is considered “*The Greatest Hitter Who Ever Lived*.” Some of his statistics are stored in TeddyBallgame.csv on myCourses. Several tasks will be completed using this file. See the top line of the file for the definition of each field in the file. Note that since this is a .csv file, all fields are separated by commas.

Task 1

Using TeddyBallgame.csv, write a single command that removes the top line of the file and replaces commas with spaces. The output should be redirected to a file TeddyBallgame.txt and to standard output (Figure 6). Use the cat

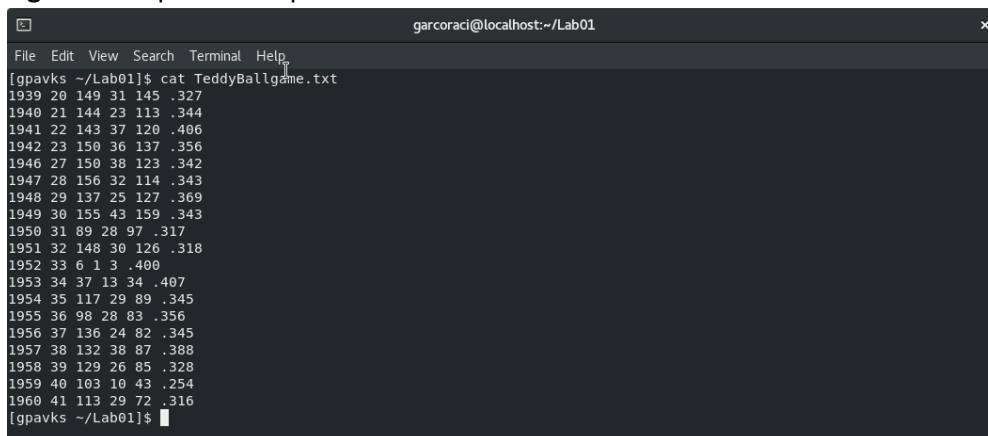
command to show the contents of the TeddyBallgame.txt file (Figure 7). The output from the cat command should match the information in standard output.

Figure 6 – Expected Output from the Command



```
garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$
1939 20 149 31 145 .327
1940 21 144 23 113 .344
1941 22 143 37 120 .406
1942 23 150 36 137 .356
1946 27 150 38 123 .342
1947 28 156 32 114 .343
1948 29 137 25 127 .369
1949 30 155 43 159 .343
1950 31 89 28 97 .317
1951 32 148 30 126 .318
1952 33 6 1 3 .400
1953 34 37 13 34 .407
1954 35 117 29 89 .345
1955 36 98 28 83 .356
1956 37 136 24 82 .345
1957 38 132 38 87 .388
1958 39 129 26 85 .328
1959 40 103 10 43 .254
1960 41 113 29 72 .316
[gpavks ~/Lab01]$
```

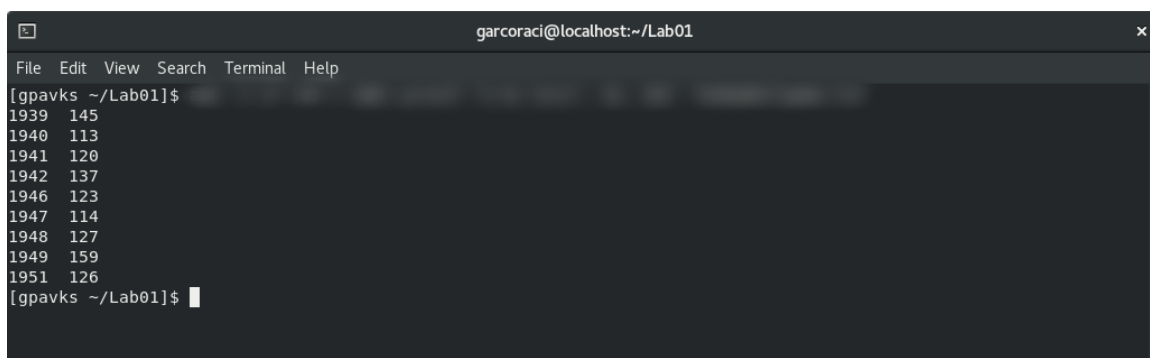
Figure 7 – Expected Output from the cat Command



```
garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$ cat TeddyBallgame.txt
1939 20 149 31 145 .327
1940 21 144 23 113 .344
1941 22 143 37 120 .406
1942 23 150 36 137 .356
1946 27 150 38 123 .342
1947 28 156 32 114 .343
1948 29 137 25 127 .369
1949 30 155 43 159 .343
1950 31 89 28 97 .317
1951 32 148 30 126 .318
1952 33 6 1 3 .400
1953 34 37 13 34 .407
1954 35 117 29 89 .345
1955 36 98 28 83 .356
1956 37 136 24 82 .345
1957 38 132 38 87 .388
1958 39 129 26 85 .328
1959 40 103 10 43 .254
1960 41 113 29 72 .316
[gpavks ~/Lab01]$
```

Task 2

Using TeddyBallgame.txt from the previous task, write a single command to output the list of all seasons where Ted Williams had 100 or more Runs Batted In or RBI. The output should only include the year and the number of Runs Batted In for that year. For sample output, refer to Figure 8. Please note that the command should not alter the contents of the file. Hint: Using an awk if statement is helpful.

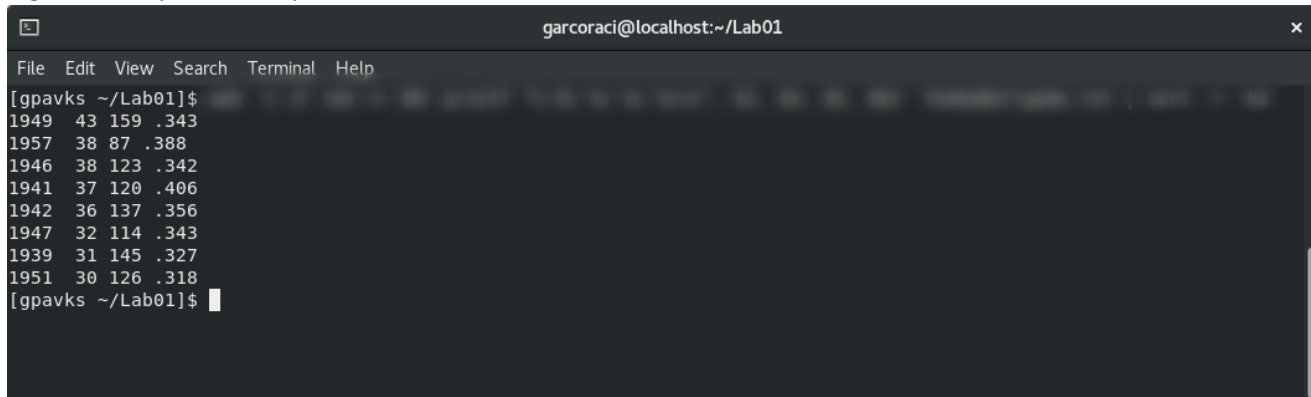


```
garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$
1939 145
1940 113
1941 120
1942 137
1946 123
1947 114
1948 127
1949 159
1951 126
[gpavks ~/Lab01]$
```

Task 3

Using the `TeddyBallgame.txt` from Task 2, write a single command to output the list of all seasons where Ted Williams hit 30 or more Home Runs. The list should be sorted from most to least Home Runs, and the final output should include the fields for the Year, Home Runs, Runs Batted In, and Batting Average for those seasons. Refer to Figure 9 for the expected output.

Figure 9 – Expected Output from Task 3



```
garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$
1949 43 159 .343
1957 38 87 .388
1946 38 123 .342
1941 37 120 .406
1942 36 137 .356
1947 32 114 .343
1939 31 145 .327
1951 30 126 .318
[gpavks ~/Lab01]$
```

Task 4

Modify the command used in Task 3 to sort the seasons by Runs Batted In from low to high. Refer to Figure 10 for the expected output.

Figure 10 – Expected Output for Task 4



```
garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$
1957 38 87 .388
1947 32 114 .343
1941 37 120 .406
1946 38 123 .342
1951 30 126 .318
1942 36 137 .356
1939 31 145 .327
1949 43 159 .343
[gpavks ~/Lab01]$
```

Task 5

Write a single command that stores the names of all `.conf` files located in `/etc` that contain an IP address beginning with “192.168” and redirects the output to a file called “out.txt.” Use the `cat` command to show the contents of the file and include the screenshot. See expected contents of `out.txt` below. Any errors should be redirected to `/dev/null` so that they are not in the file.

Figure 11 – Expected Output for Task 5

```
garcoraci@localhost:~/Lab01
File Edit View Search Terminal Help
[gpavks ~/Lab01]$ cat out.txt
/etc/chrony.conf
/etc/dnsmasq.conf
/etc/resolv.conf
/etc/rsyslog.conf
[gpavks ~/Lab01]$
```

GRADING RUBRIC AND SCREENSHOTS



↓↓↓↓↓↓↓↓↓↓ PLEASE READ ↓↓↓↓↓↓↓↓↓↓

For the submission, screenshots are required to validate the completion of the tasks. For each screenshot, specific information is requested. This information must be in a single screenshot; multiple screenshots will not receive credit. **ALL** information must appear in a single screenshot when requested. Screenshots that are illegible, blurry, or otherwise unreadable will not receive credit. Any attempt to alter the information in the screenshots is academic dishonesty and results in a zero grade for the assignment.