Instructions:

Write the answer to each question below the question in the space provided.
You can "wrap-around" the answer on separate lines if you need more space.

1. Hard Links:

    a. What is the purpose of creating a hard-link?

    -> For backup purposes. As long as one hard link of original file exists, no data is lost.

    b. What is a limitation of a hard link?
    -> You cannot hard link directories or files contained on other file-systems (network)

    c. Write a single Linux command to create a hard link called **~/backup/myfile.txt.lnk** for the existing file called **~/myfile.txt**
    -> ln ~/myfile.txt ~/backup/myfile.txt.lnk

    d. Write a single Linux command to display the **i-node** number for both files. Are the **i-node** numbers identical?

➔ ls -l **~/myfile.txt ~/backup/myfile.txt.lnk**
➔ **YES**

2. Symbolic (Soft) Links:

    a. What is the purpose of creating a symbolic (soft) link?
    -> A symbolic link is a shortcut (pointer) to an existing file.

    b. What is a limitation of a symbolic (soft) link?
    -> Not good for backup purposes.

    c. Write a single Linux command to create a symbolic link
    called **~/shortcuts/murray.saul.lnk**
    to the existing directory called **~murray.saul**
    -> ln -s ~murray.saul ~/shortcuts/murray.saul.lnk

    d. Are the i-node numbers identical for both of those files?
    -> NO

    e. What data is contained in the file called **~/shortcuts/murray.saul.lnk**?

    -> Same data as in the ~murray.saul directory

3. Background / Foreground Processes:

a. Write a single Linux command to run the program called **~/clean.sh** in the **background**.
-> ~/clean.sh &

b. Write a single Linux command to place the previously issued program in the **foreground**.
-> fg

c. Write a single Linux command to **confirm** that this program is running in the *background*.
-> jobs

d. What **key-combination** would you issue to send that program again into the **background**?
-> `Ctrl + Z`

e. Write a single Linux command to have that process sent into the background to **continue running**.

➔ bg %1

4. Managing Background processes:
Use the following diagram to answer the accompanying questions.
Each of the following questions will use the diagram below and are treated as independent situations.

```
[1]  Stopped vim a
[2]- Stopped vim b
[3]+ Stopped vim c
```

a. Write a single Linux command to bring the second-recently process placed in the background into the **foreground**.
-> fg %2

b. Write a single Linux command to **terminate job #3**.

➔ kill %3

5. Write a single Linux command to display running processes in “real-time”.

-> top

6. Write a single Linux command to terminate a process that has the following PID: **22384**
-> kill 22384

7. Aliases / History:

a. Write a linux command to create an **alias** called **ld** that issues the command: **ls -ld**
-> alias ld='ls -ld'

b. Write a linux command to unset the **alias** created in the previous question.
-> unalias ld

c. Issue a Linux command to list **history** of commands that match the pattern called **touch**.

➔ history | grep touch

8. Create a **table** listing each Linux command, useful options and command purpose for the following Linux commands:
ln , **ps** , **top** , **fg** , **bg** , **jobs** , **kill** , **alias** , **unalias** , **history**

Command	Useful Options	Purpose
ln	-	Create links between files/directories
ps	aux	Display information about running processes
top	-	Display and update sorted information about processes
fg	%job_number	Bring a background job to the foreground
bg	%job_number	Resume a suspended background job
jobs	-	List all jobs
kill	-	Terminate a process
alias	-	Create an alias for a command
unalias	-	Remove an alias
history	-	Display command history