Question 1

awk

- **Description:** Awk is a scripting language used for processing a displaying text.
- **Formula:** `awk + options + {awk command} + file`
- **Examples:**
  - **Print the first column of every line of a file:**
    - `awk '{print $1}' ~/Documents/Csv/cars.csv`
  - **Print the last field of a file:**
    - `awk -F: '{print $NF}' /etc/passwd`
  - **Print the first and 3rd field with line numbers:**
    - `awk -F: {print NR,$1,$3}' /etc/passwd`

cat

- **Description:** The cat command is used for displaying the content of a file.
- **Formula:** `cat + option +file(s) to display`
- **Examples:**
  - **Display the content of a file using absolute path:**
    - `cat ~/Documents/todo.lst`
  - **Display the content of a file with line numbers:**
    - `cat -n ~/Documents/todo.lst`
  - **Display the content of a file a $ at the end of every line:**
    - `cat -E ~/Documents/todo.lst`

cp

- **Description:** The cp command copies files/directories from a source to a destination
- **Formula:** `cp + files to copy + destination`
- **Examples:**
  - **To copy a file:**
    - `cp Downloads/wallpapers.zip Pictures/`
  - **To copy a directory with absolute path:**
    - `cp -r ~/Downloads/wallpapers ~/Pictures/`
  - **To copy multiple files in a single command:**
    - `sudo cp -r script.sh program.py home.html assets/ /var/www/html/`

cut

- **Description:** The cut command cuts a specific fields from a file.
- **Formula:** `cut + option + file(s)`
- **Examples:**
  - **Display a list of all the users in your system:**
    - `cut -d ':' -f1 /etc/passwd`
  - **Cut a file using a delimiter but changing the delimiter in the output:**

        - `cut -d ':' -f1,7 --output-delimiter=' @ ' /etc/passwd`
    - **Display a list of all the cereals with their number of calories using the delimiter ' calories = ':**
        - `cut -d ';' -f1,4 --output-delimiter=' calories = ' ~/Documents/Csv/cereal.csv`

grep

- **Description:** the grep command is used to search text in given file.
- **Formula:** `grep + option + search criteria + file(s)`
- **Examples:**
    - **Search any line that contains the word "dracula" in the given file:**
        - `grep 'dracula' ~/Documents/dracula.txt`
    - **Search any line that contains the word 'dracula' regardless of the case:**
        - `grep -i 'dracula' ~/Documents/Books/dracula.txt`
    - **Search for all the lines that don not contain the word 'war':**
        - `grep -v 'war' ~/Documents/Books/war-and-peace.txt`

head

- **Description:** The head command displays the first 10 lines.
- **Formula:** `head + option + file(s)`
- **Examples:**
    - **Display the first 10 lines of a file:**
        - `head ~/Documents/Books/dracula.txt`
    - **Display the first 5 lines of a file:**
        - `head -5 ~/Documents/Books/dracula.txt`
    - **Display the account information of the first user in your system:**
        - `head -1 /etc/passwd`

ls

- **Description:** The ls command is used for listing the content of a given directory or the file/directory itself.
- **Formula:** `ls + option + directory to list`
- **Examples:**
    - **List all the files inside the current working directory including hidden files:**
        - `ls -a`
    - **List all the files inside a given directory:**
        - `ls -a ~/Pictures`
    - **List all the files in a given directory sorted by file size:**
        - `ls -S ~/Documents`

man

- **Description:** The man command is used to display the user manual of any command given.
- **Formula:** `man + option`
- **Examples:**

    - **Display the user manual for the ls command:**
        - `man ls`
    - **Display the user manual for the grep command:**
        - `man grep`
    - **Display the user manual for the cut command:**
        - `man cut`

mkdir

- **Description:** The mkdir command is used for creating a single or multiple directories.
- **Formula:** mkdir + the name of the directory
- **Examples:**
    - **Create a directory in the present working directory:**
        - `mkdir wallpapers`
    - **Create multiple directories at once:**
        - `mkdir wallpapers/cars wallpapers/cities wallpapers/forest`
    - **Create a directory with a parent directory at the same time:**
        - `mkdir -p wallpapers_others/movies`

mv

- **Description:** The mv command moves and renames directories.
- **Formula:** `mv + source + destination`
- **Examples:**
    - **To move a file from a directory to another using relative path:**
        - `mv Downloads/homework.pdf Documents/`
    - **To move multiple directories/files to a different directory:**
        - `mv games/ wallpapers. rockmusic/ /media/student/flashdrive/`
    - **To move and rename a file in the same command:**
        - `mv Downloads/cis106homework.docx Documents/new_cis106homework.docx`

tac

- **Description:** The tac command is used for displaying the content of a file in reverse order.
- **Formula:** `tac + option + file(s) to display`
- **Examples:**
    - **Display the content of a file located in the pwd:**
        - `tac todo.md`
    - **Display the content of the /etc/passwd file in reverse order:**
        - `tac /etc/passwd`
    - **Display the content of the book dracula in reverse order:**
        - `tac ~/Documents/Books/dracula.txt`

tail

- **Description:** The tail command displays the last 10 lines.
- **Formula:** `tail + option + file`
- **Examples:**

    - **Display the last 10 lines of a file:**
        - `tail ~/Documents/Books/bible.txt`
    - **Display the account information stored in /etc/passwd of the last user in your system:**
        - `tail -1 /etc/passwd`
    - **Display the last 5 lines of a file:**
        - `tail -5 ~/Documents/Book/dracula.txt`

touch

- **Description:** The touch command is used for creating files.
- **Formula:** `touch + name of the file`
- **Examples:**
    - **To create several files:**
        - `touch list_of_cars.txt script.py names.csv`
    - **To create a file inside a directory:**
        - `touch assets/image.png`
    - **To create a file with a space in its name:**
        - `touch "list of foods.txt"`

tr

- **Description:** The tr command is used for translating or deleting characters from a standard output.
- **Formula:** `Standard output | tr + option + set + set`
- **Examples:**
    - **Translate one character to another (For example a period with a comma):**
        - `cat file.txt | tr '.' ','`
    - **Translate white space into tabs:**
        - `cat program.py | tr "[:space:]" '\t'`
    - **Translate every period to a exclamation point in bible.txt:**
        - `cat ~/Documents/Books/bible.txt | tr '.' '!'`

tree

- **Description:** The tree command list contents of directories in a tree-like format.
- **Formula:** `tree + directory`
- **Examples:**
    - **List the files in your cis106 folder using the tree command:**
        - `tree /home/jdeguzman/cis106/`
    - **List the files in your downloads folder using the tree command:**
        - `tree ~/Downloads`
    - **List all the files in your current including hidden files using the tree command:**
        - `tree -a`

Question 2

How to work with multiple terminals open?

- Open the Tilix terminal and then click the button on the top left to add a new terminal to the right or to the bottom.

How to work with manual pages?

- To access the manual page(s) for a command you type the command "man" followed by the name of the command you want to know about.
- **Example:**
  - `man ls`

How to parse (search) for specific words in the manual page

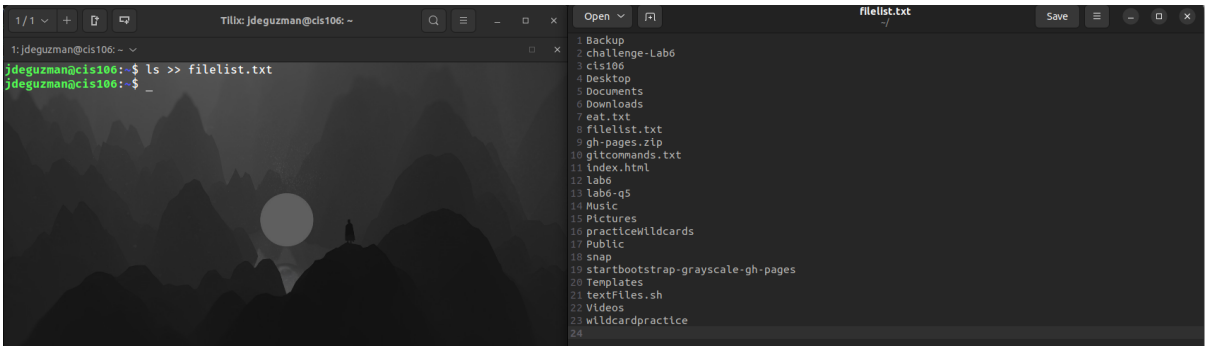
- To search for a specific word(s) in the manual page you would use the command `man ls | grep "human-readable"`

How to redirect output (> and |)

- To redirect and save an output of a file you would use the command `ls -lA ~ > all-files-in-home.txt`
- To redirect standard output you would use the | operator.
  - **Example:**
    - Display only the options of the ls command from its man page `man ls | grep "^[[:space:]]*[[:punct:]]"`

How to append the output of a command to a file

- To append the output of a command to a file you use >> operator.
- **Example:**
  - `ls >> filelist.txt`



  - `ls -la > allmyfiles.lst` This command will overwrite whatever is already inside the file.

How to use wildcards

- Wildcards represent letters and characters used to specify a file name for searches.
- File globbing is the processing of pattern matching using wildcards.
- The wildcards are officially called metacharacter wildcards.

* Wildcard

The * wildcard matches from 0 to any number of characters.

- **Examples:**
  - **List all the text files in a directory:**
    - `ls *.txt`
  - **List all the files that start with the word "file":**
    - `ls file*`
  - **Copy all the mp4 files:**
    - `cp Downloads/*.mp4 ~/Videos/Movies/`

? Wildcard

The ? Wildcard metacharacter matches precisely one character.

- **Examples:**
  - **List all the files that have 3 characters and are followed by the word "file" in the name:**
    - `ls ???File*`
  - **List all the files that have a 2 letter extension:**
    - `ls *.??`
  - **List all files that start with the letter p and have a 2 letter extension:**
    - `ls *p?*.??`

[] Wildcard

The [] Wildcard match a single character in a range. The [] Wildcard use the exclamation mark to reverse the match.

- **Examples:**
  - **Match all files that have a vowel after the letter f:**
    - `ls f[aeiou]*`
  - **Match all the files whose name does not have a number in their file name:**
    - `ls *[!0-9].*`
  - **Match all files whose name begins with any 3 combination of numbers and the current user's username:**
    - `ls [0-9][0-9][0-9]$USER`

How to use brace expansion

- The {} expansion is not a wildcard but another feature of bash that allows you to generate arbitrary strings to use with commands.
- **Examples:**
  - **Create a whole directory structure in a single command:**
    - `mkdir -p music/{jazz,rock}/{mp3files,videos,oggfiles}/new{1..3}`
  - **Remove multiple files in a single directory:**
    - `rm -r {dir1,dir2,dir3,file.txt,file.py}`
  - **Create a N number of files:**
    - `touch website{1..5}.html`