Chapter 1. BEGINNING WITH FUNDAMENTAL CONCEPTS – Exercises

Exercise 1: Navigating and Understanding the Environment

Use your command-line skills to navigate to your home directory, list all files and directories (including hidden ones), and then use the man command to learn more about the **`ls`** command. Summarize three options of the ls command in a file named **`LsOptions.txt`** without using redirection to create the file content.

Expected Output:

A file named **`LsOptions.txt`** in your home directory with a manual summary of three options for the **`ls`** command, written manually by you after reading the manual page.

Steps to Achieve the Goal:

Navigate to your home directory and list all contents.

Read the **`ls manual`** page to find interesting options.

Manually create **`LsOptions.txt`** and write summaries.

Solution:

- **`cd ~ and ls -la`**
- **`man ls`** and look for interesting options like **`-l, -a, -h`**.
- **`touch LsOptions.txt`** and use **`echo “(your_summary)” > LsOptions.txt`** to write the summaries, changing `your_summary` with your actual summary.

Exercise 2: File and Directory Mastery

Create a directory named **`Projects`** in your home directory. Inside Projects, create two files, **`Project1.txt`** and **`Project2.txt`**, using a single command. Write **"My First Project"** in Project1.txt and **"My Second Project"** in Project2.txt using command-line text editors or redirection.

Expected Output:

A Projects directory in your home directory containing two files, each with a line of text corresponding to the project title.

Steps to Achieve the Goal:

Create the **`Projects`** directory.

Simultaneously create **`Project1.txt`** and **`Project2.txt`**.

Add text to each file.

Hint/Solution:

- `mkdir ~/Projects`
- `touch ~/Projects/Project1.txt ~/Projects/Project2.txt`
- `echo "My First Project" > ~/Projects/Project1.txt and echo "My Second Project" > ~/Projects/Project2.txt`

Exercise 3: Medium - Directory Deep Dive

Create a script that navigates from your home directory to **`/etc`**, lists all the **`.conf`** files (configuration files), and redirects this list to a file named **`ConfFilesList.txt`** in your home directory.

Expected Output:

A file named **`ConfFilesList.txt`** in your home directory containing a list of all **`.conf`** files found in the **`/etc`** directory.

Hints:

Navigate to the **`/etc`** directory.

Use **`ls`** with wildcards to list **`.conf`** files.

Redirect the output to **`ConfFilesList.txt`** in your home directory.

Solution:

- **`cd /etc`**
- **`ls *.conf > ~/ConfFilesList.txt`**

Exercise 4: Medium - File Content Search

Within the **`/var/log`** directory, search for all occurrences of the word **"error"** in **`.log`** files. Redirect the output to a file named **`ErrorLogs.txt`** in your home directory. Assume you have read permissions for these log files.

Expected Output:

A file named ErrorLogs.txt in your home directory containing all lines from .log files in /var/log that contain the word "error".

Hints:

Navigate to the **`/var/log`** directory.

Use **`grep`** with wildcards to search for "**`error`**" in **`.log`** files.

Redirect the output to **`ErrorLogs.txt`** in your home directory.

Solution:

- **`cd /var/log`**
- **`grep "error" *.log > ~/ErrorLogs.txt`**

Exercise 5: Hard - System Command Locator

You're curious about where certain system commands are stored and how to get more information about them. Pick three commands you frequently use (e.g., ls, grep, cd). Find the **binary, source, and manual page locations** for these commands and write a brief **summary** of each into a file named **`CommandLocationsAndSummaries.txt`** in your home directory.

Expected Output:

A **`CommandLocationsAndSummaries.txt`** file in your home directory with the locations (**`binary, source, manual`**) of the three chosen commands and a **brief summary** of each command's purpose and usage.

Hints:

Use **`whereis`** to locate the binaries, sources, and manuals for the chosen commands.

Use **`man`** to view the manual pages and summarize the commands.

Write the findings into **`CommandLocationsAndSummaries.txt.`**

Solution:

- **`whereis ls > ~/CommandLocationsAndSummaries.txt`**
- **`man ls >> ~/CommandLocationsAndSummaries.txt`** (Repeat for each command, summarizing key points.)

Exercise 6: Personal Wiki Setup

You've decided to create a personal Wiki for your study notes using plain text files in a directory named **MyWiki** within your Documents. Your first task is to set up a directory structure based on subjects like Linux, Networking, and Scripting. Inside each subject directory, create a **README.txt** file with a brief description of the subject.

Expected Output:

A MyWiki directory in your Documents containing directories for each subject, each with its own README.txt file.

Hints

Create the **MyWiki** directory and subject directories within it.

For each subject directory, create a **README.txt** file and add a brief description.

Solution:

- `mkdir -p ~/Documents/MyWiki/{Linux,Networking,Scripting}`
- Within each subject directory, use `echo "Subject Overview" > README.txt` to create and write to the README files.

Exercise 7: Advanced File Sorting

In your Downloads directory, you've accumulated a mix of files (.pdf, .txt, .jpg, and .zip). Your task is to create a script that not only **sorts these files** into type-based directories but also **logs the name of each moved file** and its destination directory into a file named `sorting_log.txt` within Downloads.

Expected Output:

Type-based directories within Downloads containing the sorted files and a `sorting_log.txt` file logging the moves.

Hints:

Sort files into their respective type-based directories.

Log each file move with its destination directory in sorting_log.txt.

Solution:

- Use `mkdir your_file_name` to create directories for each file type if they don't exist, changing your_file_name with the actual name of the subject
- Use a combination of `mv` for moving files and `echo` to write the log entries, like `echo "Moved file.txt to TextFiles/" >> sorting_log.txt.`

Exercise 8: Basic System Information Report

Create a file named **`SystemInfo.txt`** in your Documents folder containing your **username** and a list of **directories in your home directory**.

Solution:

Find your username:

- Use the **`whoami`** command to identify your username.
- Use **`>`** to save the username to the report file:
  - **`whoami > ~/Documents/SystemInfo.txt`**

List directories in your home directory:

- Use the **`ls`** command to list all files and directories in your home directory.
- However, you might only want to list directories, not individual files. To do this, add the **`-d`** flag to the ls command:
  - **`ls -d ~/ >> ~/Documents/SystemInfo.txt`**

Exercise 9: Kali Linux Directory Discovery

Investigate the root directory of your Kali Linux system to identify at least **three directories**. Create a directory named **Discovery** in your home directory. Inside Discovery, create a file called **`findings.txt`** and list the names of the three directories from the root directory you found there.

Expected Output:

A directory named **`Discovery`** in your **home directory**, containing a file **`findings.txt`** with the names **of three directories from the root directory**.

Hint:

- Go to the root directory and list its contents to find directory names.
- Create the Discovery directory in your home directory.
- Within Discovery, create the findings.txt file.
- Write the names of three root directories into findings.txt.

Solution:

- Use **`cd /`** to navigate to the root directory.
- Use **`ls`** to view directories and files in the root.
- Use **`mkdir ~/Discovery`** to create the directory in your home.
- Use **`cd ~/Discovery`** and **`touch findings.txt`** to create the file.
- Use **`echo -e "bin\netc\nvar" > findings.txt`** to write the directory names into findings.txt.

Exercise 10: Discovering Command Locations

Use the **`which, whereis,`** and **`locate`** commands to find the full path, **`binary/source/manual`** locations, and all instances of the **`grep`** command on your system. Document your findings in a file named **`CommandPaths.txt`** in your home directory using redirection.

Expected Output:

A file named **`CommandPaths.txt`** in your home directory containing the full path, binary/source/manual locations, and all instances of the grep command.

Solution:

- **`which grep > ~/CommandPaths.txt`**
- **`whereis grep >> ~/CommandPaths.txt`**
- Update the database for locate if necessary with sudo updatedb (note: might require root privileges), then **`locate grep >> ~/CommandPaths.txt`**