Introduction to Linux – Exercise List 1 - Linux Basics

Before start to work, let's play a little bit with the commands who help us to help ourselves :

- Use the **man** command to find information about the **ls** command. What are some of the options you can use with **ls**?
- How can you access quick help for a command without opening the manual? Use the appropriate command.
- Explore the documentation for the **mkdir** command using the **info** command. What additional information does it provide compared to **man**?
- Use the **help** command to display information about built-in shell commands. Find the description of the **cd** command.
- What command can you use to display information about a shell command in a concise format? Try it with the touch command.

Now, let's start the serious work!

1) Perform the following operations in the terminal :

   a) Display your current working directory.
   b) List all files and directories in your home directory, sorted alphabetically.
   c) Create a new directory named "exam_backup" in your home directory.
   d) Change your current working directory to "exam_backup."
   e) Create a new text file named "notes.txt" in the "exam_backup" directory and write "This is my exam notes" to it.
   f) Rename "notes.txt" to "exam_notes.txt."
   g) Display the contents of "exam_notes.txt" using the cat command.
   h) Append the text "I'm learning Linux!" to "exam_notes.txt."

2) For the following questions, create a file named phonebook_file.txt with the following content:

```
Laura!1987!Maceio
Miguel!2022!JoaoPessoa
Azin!1990!Zahedan
Paula!1988!SaoPaulo
David!1989!Arcoverde
Luis!1984!Madrid
```

   Then, using Linux commands:

   a) Count the number of characters in the file.
   b) Sort the file by the name field in descending order.
   c) Sort the file by phone number in ascending order.
   d) Display only the cities and names.
   e) Replace all "!" characters with ":" (use the tr command for this).
   f) Display the first line of the file.
   g) Display the last column.
   h) Compact the file into a tar file.

3) During their travels across the galaxy, Arthur Dent and his friends stumbled upon a file that contains the answer to the ultimate question about life, the universe, and everything else. This file, named 'theLastResponse.txt,' is illustrated below and contains a single line:

```
111111111111111111111111111111111112111111110000000011100000000
000001112111111100000000011100000000000001112111111001111100011
111111111110001112111110011111100011111111111110001112111100111
111100011111111111110001112111000000000000011111111111110001112
```

11100000000000001110000000000001112111111111111000111000000000
00000111211111111111110001110001111111111112111111111111000111
10001111111111112111111111111000111000000000000111211111111111
11110001110000000000001112111111111111111111111111111111111112

Fortunately, one of their friends, Tricia McMillan, realized that every 35 characters, the digit 2 appears, and that these groups of 35 characters probably represent lines that should be displayed sequentially in a Linux terminal, one below the other. This way, the hidden message will become comprehensible.

As brave as they are, Arthur and Tricia know nothing about Linux and its commands. Therefore, they have entrusted you with the mission to decipher the file's content and reveal to the world the answer to the ultimate question about life, the universe, and everything else, using Linux commands.

So, demonstrate your exceptional Linux command line skills and reveal the hidden message.

4) Imagine you are working as a system administrator for a large web hosting company. Your company hosts numerous websites on various servers, and it's crucial to monitor and manage server resources efficiently. Today, you have received a task to identify the most memory-intensive processes on one of your web servers to ensure optimal performance.

   Using the ps command, perform the following tasks to analyze memory usage on the server:

   a) Display the top 10 processes consuming the most memory on the server. Show only the following information for each process:

      - Process ID (PID)
      - Process Name (Command)
      - Resident Set Size (RSS). This represents the memory usage in kilobytes.
      - % CPU usage

   b) Sort the processes by memory usage in descending order so that the process using the most memory appears at the top.

   Hints:

   * You can use the -e option to show information about all processes.
   * Utilize the --sort option to sort the processes by memory usage