Operating Systems Lab 1

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1 Task 2: Basic Linux Commands

In this task, we explored several essential Linux commands. Below is a list of the commands along with their descriptions:

1.1 Command Descriptions

1. `uname` – Prints system information such as the OS, kernel version, and hardware architecture.
2. `whoami` – Displays the username of the current effective user.
3. `hostname` – Shows or sets the system's hostname.
4. `pwd` – Prints the current working directory.
5. `ls` – Lists the contents of a directory.
6. `cd` – Changes the current directory.
7. `man` – Displays the system's manual for a command (e.g., `man ls`).
8. `whatis` – Provides a brief description of a command.
9. `diff` – Compares two files line by line.
10. `df` – Displays file system disk usage and available space.
11. `du` – Shows disk usage of files and directories recursively.

Note: Additional commands were covered in prior coursework and are not described here.

2 Task 3: Writing and Executing a C Program

In this task, we created, compiled, and executed a simple C program. Below are the steps:

2.1 Steps to Create and Run the Program

1. Create a file named `prog.c` using a text editor:

```
vim prog.c
```

2. Write the following C code inside the file:

```
#include <stdio.h>  // Include standard input/output library

int main() {
    printf("Hello, World!\n");  // Print "Hello, World!" to the console
    return 0;  // Indicate successful execution
}
```

3. Save and exit the editor.

4. Compile the program using GCC:

```
gcc prog.c -o prog
```

5. Make the compiled file executable:

```
chmod +x prog
```

6. Run the program:

```
./prog
```

2.2 Expected Output

When executed, the program outputs:

```
Hello, World!
```

3 Task 4: Additional Exercises

3.1 C Loops

(Include details about loop structures like `for`, `while`, `do-while`.)

3.2 C Matrix Multiplication

(Explain and provide a sample implementation.)

3.3 Exploring More Linux Commands

Below are additional useful Linux commands:

- `date` – Displays the system date and time.
- `who` – Lists logged-in users, their session details, and terminal IDs.
- `chgrp` – Changes the group ownership of a file.
- `chown` – Changes the owner of a file.
- `more` – Displays file content one screen at a time.
- `cp` – Copies files and directories.
- `id` – Displays user ID (UID) and group ID (GID).
- `finger` – Provides detailed user information.
- `lscpu` – Displays detailed CPU information.
- `pstree` – Shows a hierarchical tree of processes.
- `iwconfig` – Lists wireless network interfaces and their details.
- `netstat` – Displays network connections.
- `ssh` – Connects to a remote system securely.
- `echo` – Prints text to the terminal.
- `apt` – Package manager for Debian-based distributions.
- `reboot` – Restarts the system.
- `shutdown` – Powers off the system (supports options like immediate or scheduled shutdown).
- `systemctl` – Manages system services and processes.
- `sort` – Sorts text files line by line.
- `adduser` – Adds a new user to the system.