Operating System Lab Work

Lab 01: Linux Commands

Basic Commands

- **`pwd`** - Print working directory.
- **`ls`** - List directory contents.
- **`cd`** - Change directory.
- **`mkdir`** - Create a new directory.
- **`rmdir`** - Remove an empty directory.
- **`rm`** - Remove files or directories.
- **`cp`** - Copy files or directories.
- **`mv`** - Move or rename files or directories.
- **`touch`** - Create an empty file or update the timestamp of a file.
- **`cat`** - Concatenate and display file contents.

File Permissions and Ownership

- **`chmod`** - Change file permissions.

File Searching and Viewing

- **`find`** - Search for files in a directory hierarchy.
- **`grep`** - Search text using patterns.
- **`less`** - View file contents page by page.
- **`more`** - View file contents (similar to less).
- **`head`** - Display the first lines of a file.
- **`tail`** - Display the last lines of a file.
- **`wc`** - Count words, lines, and characters in a file.

System Information

- **`uname`** - Display system information.
- **`top`** - Display active processes.
- **`df`** - Report file system disk space usage.
- **`free`** - Display memory usage.
- **`uptime`** - Show how long the system has been running.

Networking

- **`ping`** - Check connectivity to a host.
- **`ifconfig`** - Configure network interfaces (deprecated in favor of `ip`).
- **`ip`** - Show/manipulate routing, devices, policy routing, and tunnels.

- **`netstat`** - Print network connections, routing tables, interface statistics.
- **`traceroute`** - Trace the route to a network host.
- **`curl`** - Transfer data from or to a server (supports various protocols).
- **`wget`** - Download files from the web.
- **`ssh`** - Securely connect to a remote host.

Archiving and Compression

- **`tar`** - Archive files (create and extract).
- **`gzip`** - Compress files.
- **`gunzip`** - Decompress `.gz` files.
- **`zip`** - Package and compress files.
- **`unzip`** - Extract compressed files from a `.zip` archive.

User Management

- **`useradd`** - Create a new user.
- **`userdel`** - Delete a user.
- **`usermod`** - Modify a user account.
- **`passwd`** - Change user password.
- **`who`** - Show who is logged in.
- **`whoami`** - Display the current user.

System Administration

- **`sudo`** - Execute a command with superuser privileges.
- **`systemctl`** - Control the systemd system and service manager.
- **`shutdown`** - Shut down or restart the system.
- **`reboot`** - Restart the system.
- **`history`** - Show command history.
- **`crontab`** - Schedule periodic jobs.
- **`env`** - Display the environment variables.

Development and Scripting

- **`git`** - Version control system (e.g., `git clone`, `git commit`).
- **`make`** - Build automation tool.
- **`gcc`** - GNU Compiler Collection (C/C++ compiler).
- **`python`** - Run Python scripts (or `python3` for Python 3).
- **`bash`** - GNU Bourne Again SHell (command interpreter).

Miscellaneous

- **`echo`** - Display a line of text.
- **`date`** - Display or set the system date and time.

- `cal` - Display a calendar.
- `bc` - Command-line calculator.
- `ping6` - Ping for IPv6 addresses.

Networking Utilities

- `nslookup` - Query DNS to obtain domain name or IP address mapping.

Package Management (Debian-based)

- `apt-get` - Package handling utility (e.g., install, update packages).

Firstly, do all tasks with example, then make a report.

Lab 02: Windows command

2.1 Questions for WMIC Commands

1. What command would you use to retrieve the operating system's name, version, and architecture?
2. How can you list all the software installed on your system along with their versions using WMIC?
3. Which WMIC command provides the number of cores and logical processors for the CPU?
4. How can you find out the capacity and speed of each RAM module installed on your computer?
5. What command will list all currently running processes, including their process IDs and command lines?
6. How would you terminate all instances of a specific application, such as Notepad, using WMIC?
7. Which command can you use to display the model and total size of all disk drives on your computer?
8. How can you query the number of records in the system event log using WMIC?
9. What WMIC command retrieves the MAC address and status of all network adapters?
10. Which command would you use to check when your system was last booted?
11. How can you retrieve the BIOS version and release date using WMIC?
12. How can you list all user accounts on the system using WMIC?
13. Which command can you use to list all services running on your system, along with their statuses?

2.2 Questions for Network related

1. What command would you use to display your computer's current IP address and network configuration?
2. How can you check if you can reach a specific website, like `example.com`, using CMD?
3. What command provides a list of all active network connections and listening ports on your computer?
4. If you need to release the current DHCP lease on your computer, which command should you use?
5. Which command would allow you to renew your IP address from the DHCP server?
6. How can you display the routing table for your network?
7. What command would you use to find the MAC address of your network adapter?

Firstly, do all tasks with example, then make a report.

Lab 03: Process scheduling and Memory allocation algorithm

3.1 Practice, write and make a report by java code for process scheduling algorithm of –

1. First-Come, First-Served (FCFS)
2. Shortest Job Next (SJN) / Shortest Job First (SJF)
3. Round Robin (RR)
4. Priority Scheduling

3.2 Practice, write and make a report by java code for memory allocation algorithm of –

1. First fit
2. Best fit
3. Worst fit