**Arafat Khaled Mohiuddin**

**Task 1: Basic Linux Commands**

1. **Create and Navigate Directories:**
   * Create a directory structure as follows: /home/devops/academy/project.
   * Navigate into the project directory.

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AI-generated content may be incorrect.

1. **File Management:**
   * Create an empty file named README.md inside the project directory.
   * Create another file named notes.txt and add the text "DevOps Linux Challenge" into it. o Copy notes.txt to /home/devops/academy/backup/.

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1. **Permissions:**
   * Change the permissions of README.md to be readable and writable only by the owner. o Make notes.txt readable by everyone, but writable only by the owner.

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**Task 2: User and Group Management**

1. **Create Users:**
   * Create a new user named student1.
   * Set a password for student1.
2. **Groups:**
   * Create a new group named devops.
   * Add student1 to the devops group.

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1. **User Permissions:**
   * Ensure that the project directory is accessible to members of the devops group.

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1. **Disk Usage:**
   * Display disk usage in human-readable format for /home directory and save the output to a file named disk\_usage.txt.

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**Intermediate Level**

**Task 3: Process Management**

1. **List Processes:**
   * Display all running processes and redirect the output to a file named

process\_list.txt.

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1. **Background Process:**
   * Start a simple background process that writes the current date and time to a file named timestamp.txt every minute using a while loop and sleep.

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1. **Kill Process:**
   * Find the process ID (PID) of the background process started in the previous step and terminate it.

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1. **CPU and Memory Usage:**
   * Display the current CPU and memory usage using top or htop, save a

snapshot of this information to a file named cpu\_mem\_usage.txt.

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**Task 4: Networking**

1. **Network Configuration:**
   * Display the current network configuration using ifconfig or ip addr.

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1. **Ping Test:** o Ping google.com and save the output to a file named ping\_results.txt.

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1. **Open Ports:**
   * List all open ports on the system using netstat or ss command.

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1. **Firewall Configuration:**
   * Check if the ufw (Uncomplicated Firewall) is installed and running. If not, install and enable it. o Allow incoming connections on port 80 (HTTP) and 443 (HTTPS).

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**Task 5: Shell Scripting**

1. **Backup Script:**
   * Write a shell script named backup.sh that compresses the project directory into a tar.gz file and saves it in the /home/devops/academy/backup directory. The script should include error handling to ensure the backup only proceeds if the project directory exists.

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1. **Automation Script:**
   * Create a script named cleanup.sh that deletes all files in the /home/devops/academy/backup directory that are older than 7 days.

Schedule this script to run daily using cron.

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1. **Log Rotation:**
   * Write a script named rotate\_logs.sh to rotate the timestamp.txt file if it exceeds 1MB in size and save old logs with a timestamp in the filename.

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**Advanced Level:**

* **Advanced Shell Scripting:**
* Write a script named resource\_monitor.sh that:
  + Monitors CPU, memory, and disk usage.
  + Logs usage data every 5 minutes to a file named resource\_usage.log. o Sends an alert email if CPU usage exceeds 80% or available disk space falls below 20%.

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* **User Management Automation:**
* Write a script named bulk\_user\_add.sh that: o Reads a list of usernames from a file named user\_list.txt. o Creates each user and sets a default password.
* Adds each user to a specific group (e.g., students).
* Ensures each user has a home directory created.

A screen shot of a computer program

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