## Step 1: Create, Extract, Compress, and Manage tar Backup Archives

1. Command to **extract** the TarDocs.tar archive to the current directory:
   **sudo tar -xf TarDocs.tar**
2. Command to **create** the Javaless_Doc.tar archive from the TarDocs/ directory, while excluding the TarDocs/Documents/Java directory:
   **sudo tar -cf Javaless_Docs.tar --exclude="TarDocs/Documents/Java" TarDocs/**
3. Command to ensure Java/ is not in the new Javaless_Docs.tar archive:
   **sudo tar -tf Javaless_Docs.tar | grep Java**

**Bonus**

- Command to create an incremental archive called logs_backup.tar.gz with only changed files to snapshot.file for the /var/log directory:

**#command for first incremental backup:**
**sudo tar -cvvzf logs_backup.tar.gz --listed-incremental=logs_backup_snapshot.snar --level=0 /var/log**

**#command for second backup and furthermore backups:**
**sudo tar -cvvzf logs_backup.tar.gz --listed-incremental=logs_backup_snapshot.snar /var/log**

**Critical Analysis Question**

- Why wouldn't you use the options -x and -c at the same time with tar?

**Option -x is for extraction of tar and -c is for creation of tar so they cannot be used at same time with tar command**

## Step 2: Create, Manage, and Automate Cron Jobs

1. Cron job for backing up the /var/log/auth.log file:

## 0 6 * * 3 tar -czf /auth_backup.tgz /var/log/auth.log

## Step 3: Write Basic Bash Scripts

1. Brace expansion command to create the four subdirectories:
   **mkdir -p ~/backups/{freemem,diskuse,openlist,freedisk}**

Paste your system.sh script edits below:
**#!/bin/bash**
**free -h > ~/backups/freemem/free_mem.txt**
**du -h > ~/backups/diskuse/disk_usage.txt**
**lsof > ~/backups/openlist/open_list.txt**
**df -h > ~/backups/freedisk/free_disk.txt**

2. Command to make the system.sh script executable:
   **chmod u+x system.sh**

**Optional**

- Commands to test the script and confirm its execution:
  **sudo ./system.sh**

**Bonus**

1. Command to copy system to system-wide cron directory:
   **sudo cp system.sh /etc/cron.weekly/**

## Step 4. Manage Log File Sizes

1. Run sudo nano /etc/logrotate.conf to edit the logrotate configuration file.

   Configure a log rotation scheme that backs up authentication messages to the /var/log/auth.log.

   - Add your config file edits below:

**/var/log/auth.log {**

**rotate 7**

**weekly**

**notifempty**

**delaycompress**

**missingok**

**}**