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

1. Command to **extract** the TarDocs.tar archive to the current directory:  
   tar -xvf TarDocs.tar
2. Command to **create** the Javaless\_Doc.tar archive from the TarDocs/ directory, while excluding the TarDocs/Documents/Java directory:  
   sudo tar cvvf Javaless\_Docs.tar --exclude=Java ./TarDocs/Documents/
3. Command to ensure Java/ is not in the new Javaless\_Docs.tar archive:  
   tar -tvf Javaless\_Docs.tar | grep java

#### **Critical Analysis Question**

* Why wouldn't you use the options -x and -c at the same time with tar?  
  You cannot create and extract a file at the same time as they are opposites.

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

1. Cron job for backing up the /var/log/auth.log file:  
   0 6 \* \* 3 gzip cvvf /auth\_backup.tgz /var/log/auth.log

### **Step 3: Write Basic Bash Scripts**

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

Paste your system.sh script edits below:  
  
 #!/bin/bash

1. free -h | grep Mem: | awk -F" " '{print $4}' > ~/backups/freemem/free\_mem.txt  
     
   du -h > ~/backups/diskuse/disk\_usage.txt  
     
   lsof /dev/null > ~/backups/openlist/open\_list.txt  
     
   df -h > ~/backups/freedisk/free\_disk.txt
2. Command to make the system.sh script executable:  
   chmod +x system.sh

**Optional**

* Commands to test the script and confirm its execution:  
  sudo ./system.sh  
  cd ~/backups/diskuse  
  cat disk\_usage.txt  
    
  (rinse repeat for each directory and text file)

### **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:
2. /var/log/auth.log {  
    Weekly  
    rotate 7  
    Notifempty  
    Delaycompress  
    Missingok  
   }