**Assignment 3:**

# **MTMC-509 Programming Lab-I**

**Directory Navigation & File Compression Commands**

**Directory Navigation Commands**

1. **Basic Directory Listing and Navigation**
   * Open a terminal and use the pwd command to print the current working directory.
   * List all files and directories in the current directory using the ls command.
   * Use the **ls -a** command to display hidden files and directories. What additional files are shown when you use ls -a compared to ls?
2. **Navigating to the Home Directory**
   * Use the cd ~ command to navigate to your home directory.
   * Verify your location by using the pwd command.
   * List the files and directories in your home directory using the ls -l command. What additional details do you see in the ls -l output compared to ls?
3. **Moving Up and Down the Directory Tree**
   * Create a new directory called TestDir in your home directory. Inside TestDir, create two subdirectories: Dir1 and Dir2.
   * Navigate to Dir1 using the cd command and verify your location using pwd.
   * Move up one directory level (back to TestDir) using cd .., then navigate to Dir2 from there. Verify your location again with pwd.
4. **Switching Between Directories**
   * After navigating to Dir2, use the cd - command to switch back to the previous directory (Dir1).
   * Use the cd - command again to switch back to Dir2. Describe how the cd - command helps in navigation when moving back and forth between directories.
5. **Navigating Using Absolute and Relative Paths**
   * From inside Dir2, navigate directly to /usr using the absolute path /usr. Verify your location with pwd.
   * Now, use the relative path to move back to Dir2 from the /usr directory (hint: use cd .. and specify the correct path). Verify your location again.
6. **Using the Directory Stack**
   * Use the dirs command to display the current directory stack.
   * Add the TestDir/Dir1 directory to the stack using the pushd command. Verify the directory stack again with dirs.
   * Add TestDir/Dir2 to the stack using pushd and verify the directory stack.
   * Use the popd command to remove Dir2 from the stack and navigate back to the previous directory (Dir1).
   * Display the directory stack using dirs and describe how pushd and popd can help manage directory navigation.
7. **Combining Listing Commands with Navigation**
   * Navigate to /var/log using the cd command and list the contents using ls -l.
   * Use the ls -a command to display hidden files in the /var/log directory. Compare the output to the previous listing and note any hidden files or directories.

**File Compression Commands**

 **Archiving Files with tar**

* Create a new directory named CompressionTest in your home directory.
* Inside CompressionTest, create three text files: file1.txt, file2.txt, and file3.txt.
* Use the tar cf command to archive these three files into a single archive named files\_archive.tar.  
  Command: tar cf files\_archive.tar file1.txt file2.txt file3.txt
* Verify that the archive was created by listing the contents of the CompressionTest directory using ls.

 **Extracting an Archive**

* Use the tar xf command to extract the contents of files\_archive.tar into a new directory named ExtractedFiles.  
  Command: tar xf files\_archive.tar -C ExtractedFiles
* Verify that the files have been successfully extracted by listing the contents of the ExtractedFiles directory.

 **Creating a Compressed .gz Archive**

* Archive and compress the CompressionTest directory (including all files) into a .tar.gz compressed archive named compressed\_archive.tar.gz.  
  Command: tar czf compressed\_archive.tar.gz CompressionTest/
* Verify that the compressed archive was created using the ls command.

 **Decompressing a .gz File**

* Create a backup of one of the text files in CompressionTest and compress it using the gzip command.  
  Command: gzip file1.txt
* Use the gunzip command to decompress file1.txt.gz back to its original form.  
  Command: gunzip file1.txt.gz
* Verify that file1.txt has been restored using the ls command.

 **Creating a .bz2 Compressed File**

* Compress the file2.txt file using the bzip2 command to create a .bz2 compressed file.  
  Command: bzip2 file2.txt
* Verify that the .bz2 file has been created using the ls command.
* Use the bunzip2 command to decompress file2.txt.bz2 back to its original form.  
  Command: bunzip2 file2.txt.bz2
* Verify that file2.txt has been restored.

 **Combining Compression with Archiving**

* Archive and compress both file3.txt and ExtractedFiles/ directory into a .bz2 compressed tar archive named archive\_bz2.tar.bz2.  
  Command: tar cjf archive\_bz2.tar.bz2 file3.txt ExtractedFiles/
* Verify that the .tar.bz2 archive was created using the ls command.
* Extract the contents of archive\_bz2.tar.bz2 to a new directory named Bz2Extracted using the tar command.  
  Command: tar xjf archive\_bz2.tar.bz2 -C Bz2Extracted
* Verify the extraction by listing the contents of Bz2Extracted.

 **Compressing Large Files**

* Create a new text file named largefile.txt with 1000 lines of random text.
* Compress largefile.txt using the gzip command and note the file size before and after compression.  
  Command: gzip largefile.txt
* Describe the difference in file size before and after compression using the ls -lh command.