Experiment 3

Use advanced shell commands and utilities them to perform complex file searches, data processing and manipulation.

Advanced shell commands for complex file searches

Command	Description
-name pattern	Searches for files with a specific name or pattern.
-type type	Specifies the type of file to search for (e.g., f for regular files, d for directories).
-size [+/-]n	Searches for files based on size. `+n` finds larger files, `-n` finds smaller files. ‘n’ measures size in characters.
-mtime n	Finds files based on modification time. `n` represents the number of days ago.
-print	Displays the path names of files that match the specified criteria.
-maxdepth levels	Restricts the search to a specified directory depth.
-mindepth levels	Specifies the minimum directory depth for the search.
-empty	Finds empty files and directories.
-delete	Deletes files that match the specified criteria.

Command 1: Finding Files by Name

find /home/student/DKB -name “data.csv”

Command 2: Finding Directories

find /home/student -type d

or

find /home/student -type f

Command 3: Finding Files by Size

find /home/student/DKB -type f -size +50M

Command 4: Finding Files by Modification Time

find /home/student -type f -mtime 10

Command 5: Printing File Paths

find /home/student/DKB -name ".pdf" -print*

Command 6: Limiting Search Depth

find /home/student/DKB -maxdepth 2 -type f -name ".jpg"*

Command 7: Specifying Minimum Search Depth

find /home/student/DKB -mindepth 2 -type f -name ".jpg"*

Command 8: Finding Empty Files and Directories

find /home/student/DKB -empty

Command 9: Deleting files

find /home/student/DKB -type f -empty -delete

Data processing and manipulation

- Create directory of your name

mkdir DKB

Method 1:

- Create empty csv file with name data.csv

touch data.csv

or

printf "Name, Age, Occupation\n" > data.csv

- Add contents into it (10 entries)

printf "Alice, 30, Engineer\n" >> data.csv

printf "Bob, 25, Designer\n" >> data.csv

printf "Charlie, 28, Teacher\n" >> data.csv

Method 2:

- Open file

  nano *data.csv*

- Add content (10 entries)

  Name, Age, Occupation

  Alice, 30, Engineer

  Bob, 25, Designer

  Charlie, 28, Teacher

- Save and Exit

  Press Ctrl + O to save, then Ctrl + X to exit

Tasks to be performed

1. Displaying the File Contents
2. Selecting Specific Columns
3. Extracting Specific Rows
4. Filtering Rows Based on a Condition
5. Sorting Data
6. Counting the Number of Rows
7. Finding Unique Values in a Column
8. Counting the Number of Unique Values in a Column
9. Replacing a Value in a Specific Column
10. Calculating the Average Value of a Column

1. Displaying the File Contents

```
cat data.csv
```

2. Selecting Specific Columns

```
cut -d ',' -f 1,3 data.csv
```

3. Extracting Specific Rows

```
sed -n '2,4p' data.csv
```

4. Filtering Rows Based on a Condition

```
awk -F, '$2 > 30' data.csv
```

5. Sorting Data

```
sort -t ',' -k 2,2n data.csv
```

6. Counting the Number of Rows

```
wc -l data.csv
```

7. Finding Unique Values in a Column

```
cut -d ',' -f 3 data.csv | sort | uniq
```

8. Counting the Number of Unique Values in a Column

```
cut -d ',' -f 3 data.csv | sort | uniq | wc -l
```

9. Replacing a Value in a Specific Column

```
sed 's/Engineer/Software Engineer/' data.csv > updated_data.csv
```

10. Calculating the Average Value of a Column

```
awk -F, '{sum += $2; count += 1} END {print "Average Age:",
sum/count}' data.csv
```