Assignment 6

Software Tools and Technologies

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Course : MCA
Semester : 1st semester
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Questions

1. Log Analysis using grep and awk

- Create a sample file server.log containing at least 10 lines with simulated timestamps, status codes, and messages (INFO/WARN/ERROR).

Example:

```
2025-11-07 10:15:05 WARN High memory usage detected.
2025-11-07 10:15:08 INFO Connection from 192.168.1.2
2025-11-07 10:15:12 ERROR Failed to open database connection.
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ cat server.log
2025-11-15 12:01:34 INFO Server started successfully
2025-11-15 12:05:42 WARN High memory usage detected: 85%
2025-11-15 12:08:17 ERROR Database connection failed
2025-11-15 12:15:03 INFO User admin logged in
2025-11-15 12:18:29 WARN Disk space running low: 10% remaining
2025-11-15 12:21:50 INFO Scheduled backup completed
2025-11-15 12:25:11 ERROR Failed to send email notification
2025-11-15 12:30:07 INFO New user registered: john_doe
2025-11-15 12:33:44 WARN CPU temperature high: 92°C
2025-11-15 12:37:20 ERROR File not found: /var/log/app.log
2025-11-15 12:42:55 INFO Cache cleared successfully
2025-11-15 12:45:18 WARN Slow response detected on API /login
2025-11-15 12:49:06 INFO Session expired for user jane_smith
2025-11-15 12:53:39 ERROR Unable to allocate memory for process
2025-11-15 12:58:12 INFO Server shutting down for maintenance
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

- Use grep to extract only the ERROR lines.

```
grep "ERROR" server.log
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ grep "ERROR" from server.log
grep: from: No such file or directory
server.log:2025-11-15 12:08:17 ERROR Database connection failed
server.log:2025-11-15 12:25:11 ERROR Failed to send email notification
server.log:2025-11-15 12:37:20 ERROR File not found: /var/log/app.log
server.log:2025-11-15 12:53:39 ERROR Unable to allocate memory for process
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

- Use awk to print the 1st and 3rd columns (timestamp + message).

```
awk '{print $1, $2, substr($0, index($0, $4))}' server.log
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ awk '{print $1, $2, substr($0, index($0, $4))}' server.log
2025-11-15 12:01:34 Server started successfully
2025-11-15 12:05:42 High memory usage detected: 85%
2025-11-15 12:08:17 Database connection failed
2025-11-15 12:15:03 User admin logged in
2025-11-15 12:18:29 Disk space running low: 10% remaining
2025-11-15 12:21:50 Scheduled backup completed
2025-11-15 12:25:11 Failed to send email notification
2025-11-15 12:30:07 New user registered: john_doe
2025-11-15 12:33:44 CPU temperature high: 92°C
2025-11-15 12:37:20 File not found: /var/log/app.log
2025-11-15 12:42:55 Cache cleared successfully
2025-11-15 12:45:18 Slow response detected on API /login
2025-11-15 12:49:06 Session expired for user jane_smith
2025-11-15 12:53:39 Unable to allocate memory for process
2025-11-15 12:58:12 Server shutting down for maintenance
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

- Count total ERROR lines with grep -c "ERROR".

```
grep -c "ERROR" server.log
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ grep -c "ERROR" server.log
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ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

2. Pattern Filtering with sed and cut

- Create a CSV file students.csv with fields: Name, RollNo, Course, Marks.

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ cat students.csv
Name,RollNo.,Course,Marks
Alice Johnson,101,BSc,85
Bob Smith,102,BCA,78
Carol Lee,103,BComm,92
David Brown,104,BA,88
Eva Green,105,BSc,74
Frank White,106,BCA,81
Grace Kim,107,BComm,95
Henry Davis,108,BA,67
Ivy Wilson,109,BSc,90
Jack Miller,110,BCA,82
Karen Taylor,111,BComm,76
Leo Anderson,112,BA,89
Mia Thomas,113,BSc,84
Noah Harris,114,BCA,91
Olivia Martin,115,BComm,87
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

- Display only Name and Marks columns using cut -d',' -f1,4.

```
cut -d"," -f1,4 students.csv
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ cut -d"," -f1,4 students.csv
Name,Marks
Alice Johnson,85
Bob Smith,78
Carol Lee,92
David Brown,88
Eva Green,74
Frank White,81
Grace Kim,95
Henry Davis,67
Ivy Wilson,90
Jack Miller,82
Karen Taylor,76
Leo Anderson,89
Mia Thomas,84
Noah Harris,91
Olivia Martin,87
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

- Replace every occurrence of BSc with MCA using sed -i.

```
sed 's/BSc/MCA/g' students.csv
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ sed 's/BSc/MCA/g' students.csv
Name,RollNo.,Course,Marks
Alice Johnson,101,MCA,85
Bob Smith,102,BCA,78
Carol Lee,103,BComm,92
David Brown,104,BA,88
Eva Green,105,MCA,74                               4 / 5
Frank White,106,BCA,81
Grace Kim,107,BComm,95
Henry Davis,108,BA,67
Ivy Wilson,109,MCA,90
Jack Miller,110,BCA,82
Karen Taylor,111,BComm,76
Leo Anderson,112,BA,89
Mia Thomas,113,MCA,84
Noah Harris,114,BCA,91
Olivia Martin,115,BComm,87
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

- Delete blank lines from the file.

initially

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ cat students.csv
Name,RollNo.,Course,Marks

Alice Johnson,101,BSc,85
Bob Smith,102,BCA,78
Carol Lee,103,BComm,92

David Brown,104,BA,88
Eva Green,105,BSc,74
Frank White,106,BCA,81

Grace Kim,107,BComm,95
Henry Davis,108,BA,67
Ivy Wilson,109,BSc,90

Jack Miller,110,BCA,82
Karen Taylor,111,BComm,76
Leo Anderson,112,BA,89

Mia Thomas,113,BSc,84
Noah Harris,114,BCA,91
Olivia Martin,115,BComm,87
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```

```
sed -i '/^$/d' students.csv
```

```
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$ cat students.csv
Name,RollNo.,Course,Marks
Alice Johnson,101,BSc,85
Bob Smith,102,BCA,78
Carol Lee,103,BComm,92
David Brown,104,BA,88
Eva Green,105,BSc,74
Frank White,106,BCA,81
Grace Kim,107,BComm,95
Henry Davis,108,BA,67
Ivy Wilson,109,BSc,90
Jack Miller,110,BCA,82
Karen Taylor,111,BComm,76
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Mia Thomas,113,BSc,84
Noah Harris,114,BCA,91
Olivia Martin,115,BComm,87
ravish@RavishPC:/mnt/c/work/sem1/stt/prog$
```