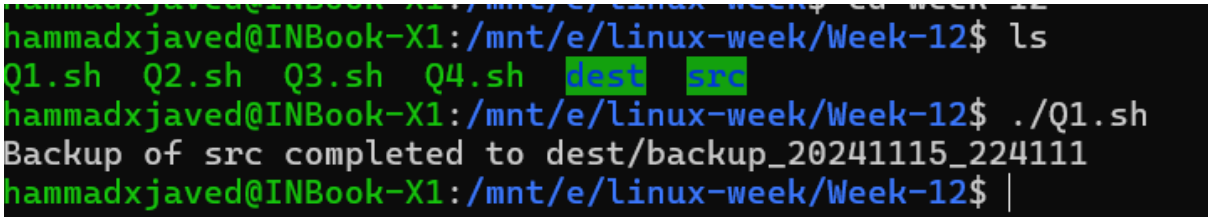
Week 12

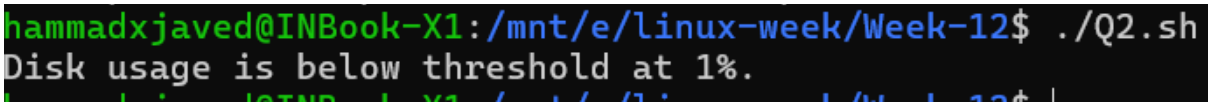
1. Write a shell script to back up a directory to a specified location.

```
SOURCE_DIR="src"

BACKUP_DIR="dest"

TIMESTAMP=$(date +"%Y%m%d_%H%M%S")

DEST="$BACKUP_DIR/backup_$TIMESTAMP"

mkdir -p "$DEST"

cp -r "$SOURCE_DIR"/* "$DEST"


echo "Backup of $SOURCE_DIR completed to $DEST"
```



2. Write a shell script to monitor disk usage and send an alert if usage exceeds a threshold.

```
THRESHOLD=80

USAGE=$(df / | grep / | awk '{print $5}' | sed 's/%//g')

if [ "$USAGE" -gt "$THRESHOLD" ]; then
    echo "Disk usage is above $THRESHOLD% at ${USAGE}%."
else
    echo "Disk usage is below threshold at ${USAGE}%."
fi
```



3. Write a shell script to automate the creation of user accounts.

```
usage() {
    echo "Usage: $0 -u <username> -p <password>"
    exit 1
}

if [ "$(id -u)" -ne 0 ]; then
    echo "This script must be run as root"
    exit 1
fi

while getopts "u:p:" opt; do
    case $opt in
        u) username=$OPTARG ;;
        p) password=$OPTARG ;;
        *) usage ;;
    esac
done
if [ -z "$username" ] || [ -z "$password" ]; then
    usage
fi
useradd -m -s /bin/bash "$username"
echo "$username:$password" | chpasswd

echo "User $username has been created"
```

```
hammadxjaved@INBook-X1:/mnt/e/linux-week/Week-12$ sudo ./Q3.sh -u userdemo -p pass123
User userdemo has been created
hammadxjaved@INBook-X1:/mnt/e/linux-week/Week-12$
```

4. Write a shell script to search for a specific pattern in a file and display the results.

```
if [ "$#" -ne 2 ]; then
    echo "Usage: $0 <file> <pattern>"
    exit 1
fi
grep "$2" "$1"
```

```
hammadxjaved@INBook-X1:/mnt/e/linux-week/Week-12$ ./Q4.sh ./src/patternfile.txt he
hello world
help
hellen
hammadxjaved@INBook-X1:/mnt/e/linux-week/Week-12$
```

5. Consider two features x and y based on the following function:

y = x12 + 3x2 + c, where c can be prepared based on 1000 random values between 0 and 1

Now generate 1000 random values between 0 and 1 for x1 and x2. Calculate y based on above function. Now train Polynomial Regression model and check the score for the same.

```
import numpy as np
from sklearn.preprocessing import PolynomialFeatures
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score

x1 = np.random.rand(1000, 1)
x2 = np.random.rand(1000, 1)

c = np.random.rand(1000, 1)

y = (x1 ** 2) + (3 * x2) + c
```

```
X = np.hstack((x1, x2))


poly = PolynomialFeatures(degree=2)
X_poly = poly.fit_transform(X)


model = LinearRegression()
model.fit(X_poly, y)


y_pred = model.predict(X_poly)
score = r2_score(y, y_pred)


print("R^2 Score:", score)
```

```
PS C:\Users\Hammad\OneDrive - myamu.ac.in\Desktop\MCA\MCA III\CAMS3P01 Laboratory Course-III (Mi
i Project)\Weeks\MCA-III_LAB> & C:/Users/Hammad/AppData/Local/Microsoft/WindowsApps/python3.12.e
e "c:/Users/Hammad/OneDrive - myamu.ac.in/Desktop/MCA/MCA III/CAMS3P01 Laboratory Course-III (Mi
i Project)/Weeks/MCA-III_LAB/Week-12/Q5.py"
R^2 Score: 0.9069586377899034
PS C:\Users\Hammad\OneDrive - myamu.ac.in\Desktop\MCA\MCA III\CAMS3P01 Laboratory Course-III (Mi
i Project)\Weeks\MCA-III_LAB>
```