Question 27:

27.Question: Logistic Regression for Customer Churn Prediction

You are working for a telecommunications company, and you want to predict whether a customer

will churn (leave the company) based on their usage patterns and demographic data. You have

collected a dataset of past customers with their churn status (0 for not churned, 1 for churned) and

various features.

Write a Python program that allows the user to input the features (e.g., usage minutes, contract

duration) of a new customer. The program should use logistic regression from scikit-learn to predict

whether the new customer will churn or not based on the input features.

Answer:

import pandas as pd

from sklearn.linear\_model import LogisticRegression

from sklearn.model\_selection import train\_test\_split

from sklearn.preprocessing import StandardScaler

# Step 1: Load data from Excel

data = pd.read\_excel(r"C:\Users\hares\Downloads\q27\_05.xlsx")

# Step 2: Strip column names

data.columns = [str(col).strip() for col in data.columns]

# Step 3: Features and Target

X = data[['Usage (mins)', 'Contract (months)', 'Age']]

y = data['Churn']

# Step 4: Preprocess and Split

scaler = StandardScaler()

X\_scaled = scaler.fit\_transform(X)

# Step 5: Train model

model = LogisticRegression()

model.fit(X\_scaled, y)

# Step 6: Get user input

usage = float(input("Enter usage in minutes: "))

contract = int(input("Enter contract duration in months: "))

age = int(input("Enter age of customer: "))

# Step 7: Predict

user\_input = pd.DataFrame([[usage, contract, age]], columns=['Usage (mins)', 'Contract (months)', 'Age'])

user\_input\_scaled = scaler.transform(user\_input)

prediction = model.predict(user\_input\_scaled)[0]

prob = model.predict\_proba(user\_input\_scaled)[0][1]

# Step 8: Output result

status = "will churn" if prediction == 1 else "will not churn"

print(f"\nPrediction: The customer {status} (Probability: {prob:.2f})")

Output:

Enter usage in minutes: 53

Enter contract duration in months: 5

Enter age of customer: 20

Prediction: The customer will churn (Probability: 0.93)