import numpy as np  
import pandas as pd  
from sklearn.model\_selection import train\_test\_split  
from sklearn.linear\_model import LogisticRegression  
from sklearn.metrics import accuracy\_score, classification\_report  
import matplotlib.pyplot as plt  
  
# Load the data  
hill\_valley\_data = pd.read\_csv('hill\_valley\_data.csv') # Assuming you have this CSV file  
  
# Separate features and target  
X = hill\_valley\_data.drop('class', axis=1)  
y = hill\_valley\_data['class']  
  
# Split the data  
X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)  
  
# Create and train the model  
model = LogisticRegression()  
model.fit(X\_train, y\_train)  
  
# Make predictions  
y\_pred = model.predict(X\_test)  
  
# Evaluate the model  
accuracy = accuracy\_score(y\_test, y\_pred)  
print(f"Accuracy: {accuracy:.2f}")  
print("\nClassification Report:")  
print(classification\_report(y\_test, y\_pred))  
  
# Visualize a sample prediction  
sample = X\_test.iloc[0]  
plt.plot(sample)  
plt.title(f"Predicted: {'Hill' if model.predict([sample])[0] == 1 else 'Valley'}")  
plt.xlabel("Feature")  
plt.ylabel("Value")  
plt.show()