```
In [39]: import numpy as np
         import pandas as pd
         from sklearn.model_selection import train_test_split
         from sklearn.preprocessing import StandardScaler
         from sklearn.linear_model import LogisticRegression
         from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
         from sklearn.metrics import accuracy_score, confusion_matrix
         import matplotlib.pyplot as plt
         import seaborn as sns
In [24]: | data = pd.read_csv('Iris.csv')
         data.head()
Out[24]:
            Id SepalLengthCm SepalWidthCm PetalLengthCm PetalWidthCm Class Label
                         5.1
                                      3.5
                                                   1.4
                                                                0.2
                                                                     Iris-setosa
                                                                0.2
          1
            2
                         4.9
                                      3.0
                                                   1.4
                                                                     Iris-setosa
                                                                0.2
                                                                     Iris-setosa
                         4.7
                                                   1.3
          3 4
                         4.6
                                      3.1
                                                   1.5
                                                                0.2
                                                                     Iris-setosa
          4 5
                         5.0
                                      3.6
                                                   1.4
                                                                0.2
                                                                     Iris-setosa
In [25]: X = data.iloc[:, :-1]
         y = data['Class Label']
In [26]: X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, ra
In [27]: | sc = StandardScaler()
         X_train_scaled = sc.fit_transform(X_train)
         X test scaled = sc.transform(X test)
In [28]: | lda = LinearDiscriminantAnalysis()
         X_train_lda = lda.fit_transform(X_train_scaled, y_train)
         X_test_lda = lda.transform(X_test_scaled)
In [29]: classifier = LogisticRegression()
         classifier.fit(X train lda, y train)
         y_pred = classifier.predict(X_test_lda)
In [30]: |print(y_pred)
         ['Iris-versicolor' 'Iris-setosa' 'Iris-virginica' 'Iris-versicolor'
          'Iris-versicolor' 'Iris-setosa' 'Iris-versicolor' 'Iris-virginica'
          'Iris-versicolor' 'Iris-versicolor' 'Iris-virginica' 'Iris-setosa'
          'Iris-setosa' 'Iris-setosa' 'Iris-versicolor'
          'Iris-virginica' 'Iris-versicolor' 'Iris-versicolor' 'Iris-virginica'
          'Iris-setosa' 'Iris-virginica' 'Iris-setosa' 'Iris-virginica'
          'Iris-virginica' 'Iris-virginica' 'Iris-virginica'
          'Iris-setosa' 'Iris-setosa']
```

```
In [33]:
         accuracy = accuracy_score(y_test, y_pred)
         conf_matrix = confusion_matrix(y_test, y_pred)
         print('Accuracy is:', accuracy)
         print('Confusion Matrix is as follows:\n',conf_matrix)
         Accuracy is: 1.0
         Confusion Matrix is as follows:
          [[10 0 0]
          [0 9 0]
          [ 0 0 11]]
In [37]: X_train_scaled
Out[37]: array([[-1.21030717, -1.47393679, 1.22037928, -1.5639872, -1.3094835
         8],
                [-1.37240188, -0.13307079, 3.02001693, -1.27728011, -1.0429220]
         4],
                [-0.21458252, 1.08589829, 0.09560575, 0.38562104, 0.2898856
         8],
                [-1.46502743, -1.23014297, 0.77046987, -1.21993869, -1.3094835
         8],
                [-0.74717943, -1.7177306, 0.32056046, -1.39196294, -1.3094835
         8],
                [ 1.66108484, 0.59831066, -1.25412249, 0.72966956, 0.9562895
         4],
                [-0.53877194, 0.72020757, 0.32056046, 0.44296246, 0.4231664
         5],
                [-1.09452523, -0.74255534, 0.99542457, -1.27728011, -1.3094835
         8],
                \lceil -1.62712214, -0.98634915, 1.22037928, -1.33462153, -1.3094835 \rceil
         8],
                [-0.9787433, -0.74255534, 2.34515281, -1.27728011, -1.4427643]
In [38]: |X_train_lda
Out[38]: array([[ 1.00626749e+01, -9.53053868e-01],
                [ 1.07516033e+01, -2.17307919e+00],
                [-1.05948127e+00, 6.67055614e-01],
                [ 8.94315519e+00, 5.68719220e-01],
                [ 7.96441210e+00, -5.67361220e-01],
                [-7.47052860e+00, -1.12129676e+00],
                [-1.01319935e+00, 1.15921964e+00],
                [ 8.99338150e+00, -5.29388123e-01],
                [ 1.00471674e+01, 1.64996695e-01],
                [ 1.01023906e+01, -1.87934031e+00],
                [-7.45691782e+00, -1.11296749e+00],
                [-2.25785621e+00, -6.54836193e-01],
                [-2.62788804e+00, 5.31750012e-02],
                [ 1.01087201e+01, -1.34789555e+00],
                [ 1.00190501e+01, -2.79258859e-01],
                [-1.04364986e+00, 1.27035306e+00],
                [-5.77625718e+00, -7.26250144e-01],
                [-6.87655459e+00, -1.32386975e+00],
                [-1.62295431e+00, 4.79157122e-01],
```

In [42]: plt.scatter(data['SepalLengthCm'], data['Class Label'])
 plt.show()

