Logistics Regression Model

July 29, 2023

[3]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.metrics import accuracy_score
```

[2]:
```
# Sample data (hours of study and hours of sleep) and corresponding labels␣
 ↪(pass/fail)
X = np.array([[4, 8],
              [6, 7],
              [5, 6],
              [7, 9],
              [3, 7],
              [8, 5]])

y = np.array([0, 0, 1, 1, 0, 1])
```

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```
# Splitting the data (Train and Test)
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[9]:
```
from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test = train_test_split(X,y, test_size= 0.2 ,␣
 ↪random_state = 0)
```

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# Creating a logistic regression model
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[21]:
```
from sklearn.linear_model import LogisticRegression
lr_reg = LogisticRegression()
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```
# Training the model with the training data
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[22]:
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lr_reg.fit(X_train,y_train)
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[22]:
```
LogisticRegression()
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# Making predictions on the test set
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y_pred = lr_reg.predict(X_test)
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# Calculating the accuracy of the model
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[27]:
```
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

```
Accuracy: 0.0
```

[28]:
```
# Plotting the decision boundary
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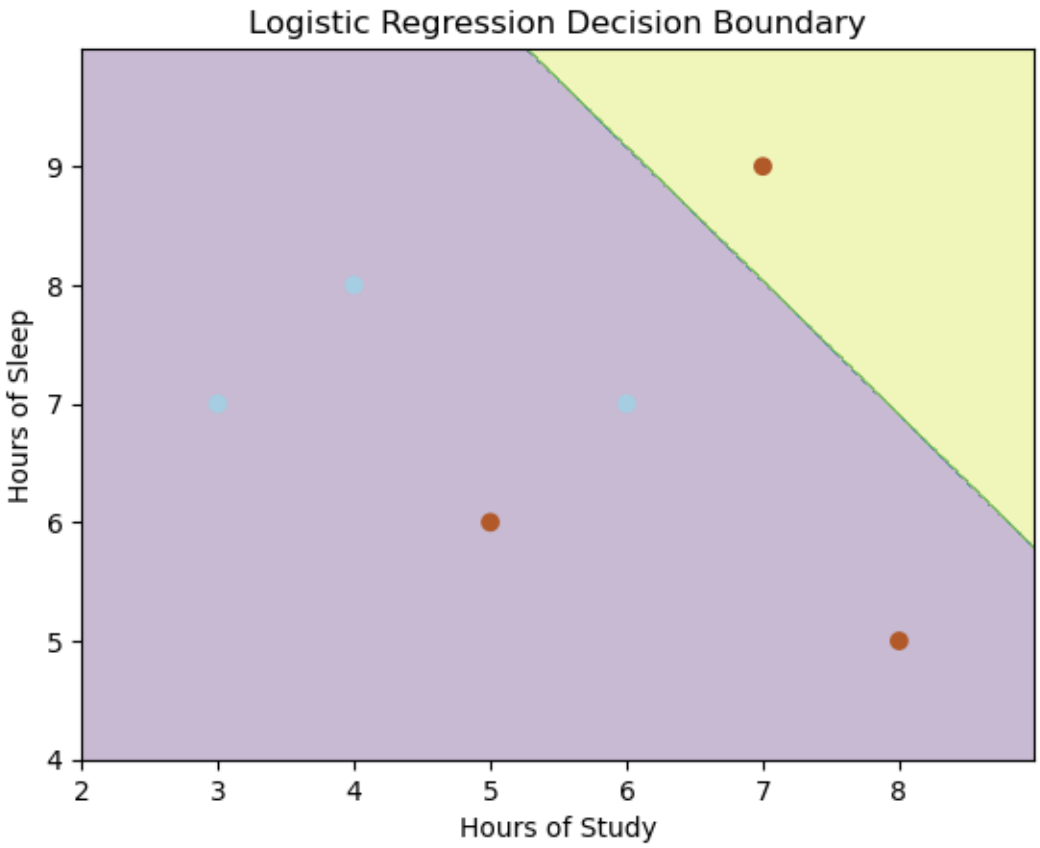
[29]:
```
if X.shape[1] == 2:
    # Create a meshgrid to plot the decision boundary
    x1_min, x1_max = X[:, 0].min() - 1, X[:, 0].max() + 1
    x2_min, x2_max = X[:, 1].min() - 1, X[:, 1].max() + 1
    xx1, xx2 = np.meshgrid(np.arange(x1_min, x1_max, 0.01),
                           np.arange(x2_min, x2_max, 0.01))
```

[32]:
```
# Make predictions for each point in the meshgrid
Z = lr_reg.predict(np.c_[xx1.ravel(), xx2.ravel()])
Z = Z.reshape(xx1.shape)
```

[33]:
```
# Plot the decision boundary
```

[34]:
```
    plt.contourf(xx1, xx2, Z, alpha=0.3)
    plt.scatter(X[:, 0], X[:, 1], c=y, cmap=plt.cm.Paired)
    plt.xlabel('Hours of Study')
    plt.ylabel('Hours of Sleep')
    plt.title('Logistic Regression Decision Boundary')
    plt.show()
```


Logistic Regression Decision Boundary
Hours of Sleep
Hours of Study
9
8
7
6
5
4
2
3
4
5
6
7
8

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