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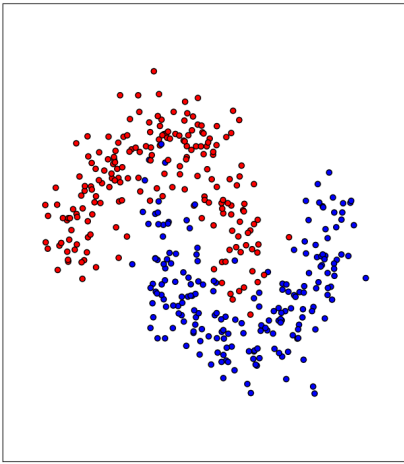
1  from sklearn.datasets import make_moons
2  import matplotlib.pyplot as plt
3  import numpy as np
4  from matplotlib.colors import ListedColormap
5  from sklearn.inspection import DecisionBoundaryDisplay
6  from sklearn.neighbors import KNeighborsClassifier
7  from sklearn.linear_model import LogisticRegression
8
9
10 #####
11 # create datasets
12 #####
13 X, y = make_moons(noise=0.2, random_state=0, n_samples=400)
14 x_min, x_max = X[:, 0].min() - 0.5, X[:, 0].max() + 0.5
15 y_min, y_max = X[:, 1].min() - 0.5, X[:, 1].max() + 0.5
16
17
18
19
20 #####
21 # plot datasets
22 #####
23 figure = plt.figure(figsize=(27, 9))
24
25 cm = plt.cm.RdBu
26 cm_bright = ListedColormap(["#FF0000", "#0000FF"])
27 ax = plt.subplot(1, 2 + 1, 1)
28 ax.scatter(X[:, 0], X[:, 1], c=y, cmap=cm_bright, edgecolors="k")
29 ax.set_xlim(x_min, x_max)
30 ax.set_ylim(y_min, y_max)
31 ax.set_xticks(())
32 ax.set_yticks(())
33 ax.set_title("Scatter Plots", fontsize=20)
34
35
36
37
38 #####
39 # plot decision boundary for K-nearest neighbors
40 #####
41 ax = plt.subplot(1, 2 + 1, 2)
42
43 clf = KNeighborsClassifier(3)
44 clf.fit(X, y)
45
46 DecisionBoundaryDisplay.from_estimator(
47     clf, X, cmap=cm, alpha=0.8, ax=ax, eps=0.5
48 )
49 ax.scatter(X[:, 0], X[:, 1], c=y, cmap=cm_bright, edgecolors="k")
50 ax.set_xlim(x_min, x_max)
51 ax.set_ylim(y_min, y_max)
52 ax.set_xticks(())
53 ax.set_yticks(())
54
55 ax.set_title("K Nearest Neighbors", fontsize=20)
56
57 #####
58 # plot decision boundary for logistic regression
59 #####
60 ax = plt.subplot(1, 2 + 1, 3)
61
62 clf = LogisticRegression(random_state=0)
63 clf.fit(X, y)
64
65 DecisionBoundaryDisplay.from_estimator(
66     clf, X, cmap=cm, alpha=0.8, ax=ax, eps=0.5
67 )
68 ax.scatter(X[:, 0], X[:, 1], c=y, cmap=cm_bright, edgecolors="k")
69 ax.set_xlim(x_min, x_max)
70 ax.set_ylim(y_min, y_max)
71 ax.set_xticks(())
72 ax.set_yticks(())
73 ax.set_title("Logistic Regression", fontsize=20)
74
75
76 plt.savefig("moons.pdf", bbox_inches='tight')

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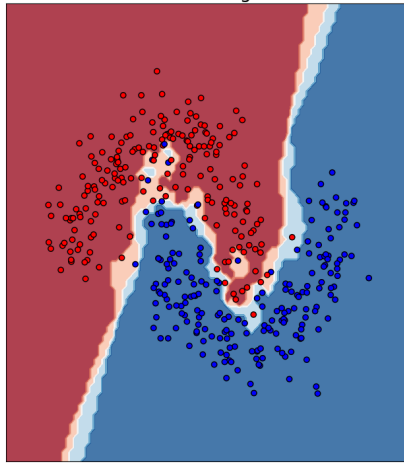
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Scatter Plots



K Nearest Neighbors



Logistic Regression

