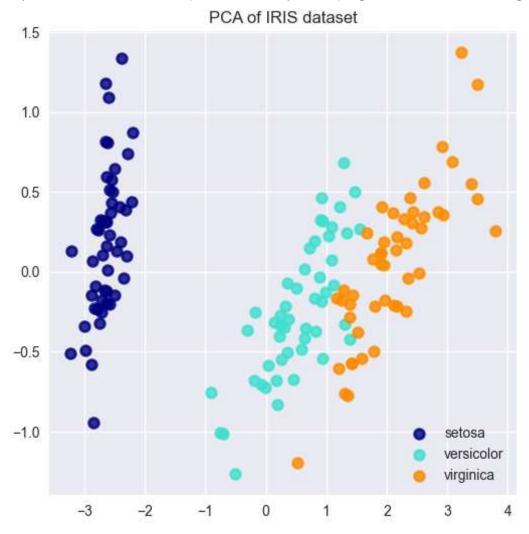
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```
In [1]: # 导入操作系统库
       import os
       # 更改工作目录
       os.chdir(r"D:\softwares\applied statistics\pythoncodelearning\chap2\sourcecode")
       # 导入绘图库
       import matplotlib.pyplot as plt
       import matplotlib as mpl
       # 导入线性和二次判别分析工具
       from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
        # 加载数据集
       from sklearn.datasets import load iris
       # 导入PCA工具
       from sklearn.decomposition import PCA
       # 导入绘图库中的字体管理包
       from matplotlib import font_manager
       # 实现中文字符正常显示
       font = font manager.FontProperties(fname=r"C:\Windows\Fonts\SimKai.ttf")
        # 使用seaborn风格绘图
       plt.style.use("seaborn-v0 8")
       # 加载数据集
       iris = load iris()
       X = iris.data
       y = iris.target
       target_names = iris.target_names
       #建立PCA模型,指定两个主成分
       pca = PCA(n components=2)
       #模型拟合
       pca.fit(X)
       # 主成分的值
       X r = pca.transform(X)
        #建立LDA模型,两个主成分
       lda = LinearDiscriminantAnalysis(n components=2)
       #模型拟合
       lda.fit(X, y)
       # 计算主成分的值
       X r2 = lda.transform(X)
        # 方差解释比
       print(
           "explained variance ratio (first two components): %s"
           % str(pca.explained_variance_ratio_)
       # 开始绘图
       fig1, ax = plt.subplots(figsize=(6,6))
       colors = ["navy", "turquoise", "darkorange"]
       1w = 2
       for color, i, target_name in zip(colors, [0, 1, 2], target_names):
           ax.scatter(
               X r[y == i, 0], # 第一主成分, 分类别
               X_r[y == i, 1], # 第二主成分, 分类别
               color=color, alpha=0.8,
               lw=lw, label=target_name
       ax.legend(loc="best", shadow=False, scatterpoints=1)
        ax.set title("PCA of IRIS dataset")
       plt.show()
       fig1.savefig("../codeimage/code2.pdf")
       fig2, ax = plt.subplots(figsize=(6,6))
```

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```
for color, i, target_name in zip(colors, [0, 1, 2], target_names):
    ax.scatter(
        X_r2[y == i, 0],
        X_r2[y == i, 1],
        alpha=0.8, color=color,
        label=target_name
    )
ax.legend(loc="best", shadow=False, scatterpoints=1)
ax.set_title("LDA of IRIS dataset")
plt.show()
fig2.savefig("../codeimage/code3.pdf")
```

explained variance ratio (first two components): [0.92461872 0.05306648]



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