Assignment Data Visualisation

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In this assignment students have to transform iris data into 3 dimensions and plot a 3d chart with transformed dimensions and colour each data point with specific class.

Hint:

```
import numpy as np

import matplotlib.pyplot as plt

from mpl_toolkits.mplot3d import Axes3D

from sklearn import decomposition

from sklearn import datasets
```

```
[ ]  import numpy as np
     import cufflinks as cf
     import pandas as pd
     import seaborn as sns
     import matplotlib.pyplot as  plt
     %matplotlib inline

     from mpl_toolkits.mplot3d import Axes3D
     from sklearn import decomposition
     from sklearn import datasets
```

```
17]  from sklearn.decomposition import PCA
```

```
15]  from sklearn import datasets

     iris = datasets.load_iris()
     print (type(iris.data))
     iris.data.shape
```

```
     <class 'numpy.ndarray'>
     (150, 4)
```

```
[23] X = iris.data[:, :2]  # we only take the first two features.
     Y = iris.target

     x_min, x_max = X[:, 0].min() - .5, X[:, 0].max() + .5
     y_min, y_max = X[:, 1].min() - .5, X[:, 1].max() + .5


     plt.figure(2, figsize=(7, 4))

     plt.clf()

     # Plot the training points
     plt.scatter(X[:, 0], X[:, 1], c=Y, cmap=plt.cm.coolwarm)
     plt.xlabel('Sepal length')
     plt.ylabel('Sepal width')

     plt.xlim(x_min, x_max)
     plt.ylim(y_min, y_max)
     plt.xticks(())
     plt.yticks(())


     # To getter a better understanding of interaction of the dimensions
     # plot the first three PCA dimensions
     fig = plt.figure(1, figsize=(8, 6))
     ax = Axes3D(fig, elev=-150, azim=110)

     X_reduced = PCA(n_components=3).fit_transform(iris.data)
```

[23]
```
ax.scatter(X_reduced[:, 0], X_reduced[:, 1], X_reduced[:, 2], c=Y,
           cmap=plt.cm.coolwarm)

ax.set_title("First three PCA directions")
ax.set_xlabel("Sepal Length")
ax.set_ylabel("Sepal Width")
ax.set_zlabel("Petal Length")
plt.show()
```