

```
In [31]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
from sklearn.datasets import load_iris
```

```
In [6]: iris = load_iris()
```

```
In [7]: dir(iris)
```

```
Out[7]: ['DESCR', 'data', 'feature_names', 'filename', 'target', 'target_names']
```

```
In [8]: iris.feature_names
```

```
Out[8]: ['sepal length (cm)',
'sepal width (cm)',
'petal length (cm)',
'petal width (cm)']
```

```
In [9]: iris.target_names
```

```
Out[9]: array(['setosa', 'versicolor', 'virginica'], dtype='<U10')
```

```
In [10]: a = pd.DataFrame(iris.data, columns=iris.feature_names)
a
```

```
Out[10]:
```

| | sepal length (cm) | sepal width (cm) | petal length (cm) | petal width (cm) |
|----|-------------------|------------------|-------------------|------------------|
| 0 | 5.1 | 3.5 | 1.4 | 0.2 |
| 1 | 4.9 | 3.0 | 1.4 | 0.2 |
| 2 | 4.7 | 3.2 | 1.3 | 0.2 |
| 3 | 4.6 | 3.1 | 1.5 | 0.2 |
| 4 | 5.0 | 3.6 | 1.4 | 0.2 |
| 5 | 5.4 | 3.9 | 1.7 | 0.4 |
| 6 | 4.6 | 3.4 | 1.4 | 0.3 |
| 7 | 5.0 | 3.4 | 1.5 | 0.2 |
| 8 | 4.4 | 2.9 | 1.4 | 0.2 |
| 9 | 4.9 | 3.1 | 1.5 | 0.1 |
| 10 | 5.4 | 3.7 | 1.5 | 0.2 |

```
In [11]: a.shape
```

```
Out[11]: (150, 4)
```

Univariate

```
In [17]: a['target'] = iris.target
a
```

Out[17]:

| | sepal length (cm) | sepal width (cm) | petal length (cm) | petal width (cm) | target |
|----|-------------------|------------------|-------------------|------------------|--------|
| 0 | 5.1 | 3.5 | 1.4 | 0.2 | 0 |
| 1 | 4.9 | 3.0 | 1.4 | 0.2 | 0 |
| 2 | 4.7 | 3.2 | 1.3 | 0.2 | 0 |
| 3 | 4.6 | 3.1 | 1.5 | 0.2 | 0 |
| 4 | 5.0 | 3.6 | 1.4 | 0.2 | 0 |
| 5 | 5.4 | 3.9 | 1.7 | 0.4 | 0 |
| 6 | 4.6 | 3.4 | 1.4 | 0.3 | 0 |
| 7 | 5.0 | 3.4 | 1.5 | 0.2 | 0 |
| 8 | 4.4 | 2.9 | 1.4 | 0.2 | 0 |
| 9 | 4.9 | 3.1 | 1.5 | 0.1 | 0 |
| 10 | 5.4 | 3.7 | 1.5 | 0.2 | 0 |

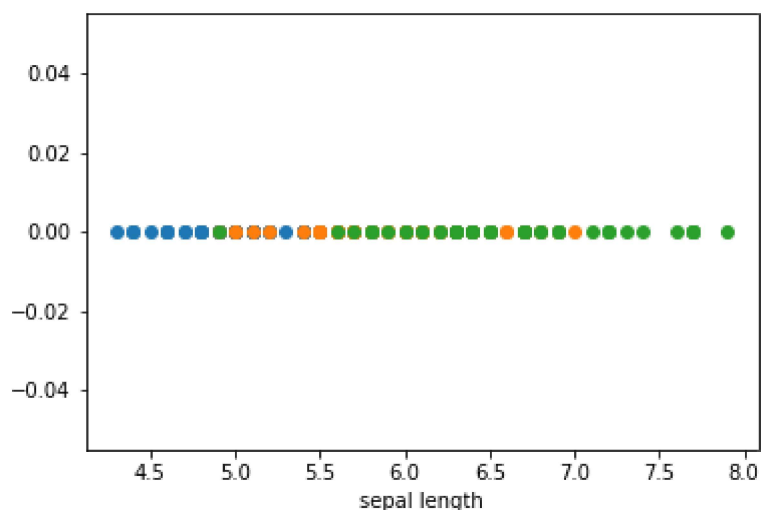
```
In [22]: s=a[a.target==0]
```

```
In [23]: ve=a[a.target==1]
```

```
In [24]: vi=a[a.target==2]
```

```
In [32]: plt.plot(s['sepal length (cm)'],np.zeros_like(s['sepal length (cm)']),'o')
plt.plot(ve['sepal length (cm)'],np.zeros_like(ve['sepal length (cm)']),'o')
plt.plot(vi['sepal length (cm)'],np.zeros_like(vi['sepal length (cm)']),'o')
plt.xlabel('sepal length')
```

Out[32]: Text(0.5, 0, 'sepal length')

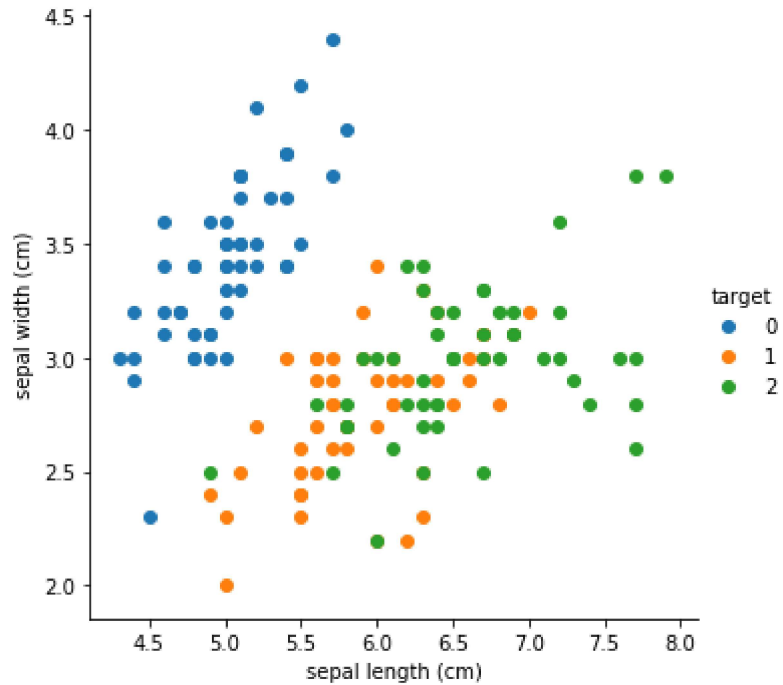


Bivariate

```
In [35]: sns.FacetGrid(a,hue='target',size=5).map(plt.scatter,'sepal length (cm)','sepal v
```

```
C:\Users\deepak\Anaconda3.7\lib\site-packages\seaborn\axisgrid.py:230: UserWarn  
ing: The `size` paramter has been renamed to `height`; please update your code.  
warnings.warn(msg, UserWarning)
```

```
Out[35]: <seaborn.axisgrid.FacetGrid at 0x260857c2278>
```



Multi Variate

```
In [36]: sns.pairplot(a,hue='target',size=5)
```

C:\Users\deepak\Anaconda3.7\lib\site-packages\seaborn\axisgrid.py:2065: UserWarning: The `size` parameter has been renamed to `height`; please update your code.

```
warnings.warn(msg, UserWarning)
```

C:\Users\deepak\Anaconda3.7\lib\site-packages\statsmodels\nonparametric\kde.py:488: RuntimeWarning: invalid value encountered in true_divide

```
    binned = fast_linbin(X, a, b, gridsize) / (delta * nobs)
```

C:\Users\deepak\Anaconda3.7\lib\site-packages\statsmodels\nonparametric\kdtool.py:34: RuntimeWarning: invalid value encountered in double_scalars

```
    FAC1 = 2*(np.pi*bw/RANGE)**2
```

```
Out[36]: <seaborn.axisgrid.PairGrid at 0x260858bda58>
```



In []: