

Live 2025-10-29

October 29, 2025

1 PCA Live 2025-10-29

```
[1]: import numpy as np  
import pandas as pd  
import matplotlib.pyplot as plt  
import seaborn as sns
```

```
[2]: X = sns.load_dataset('iris')  
y = X.species  
X = X.drop('species',axis=1)
```

```
[3]: X.head()
```

```
[3]:   sepal_length  sepal_width  petal_length  petal_width  
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
```

```
[6]: from sklearn import decomposition  
  
myPca = decomposition.PCA(2)
```

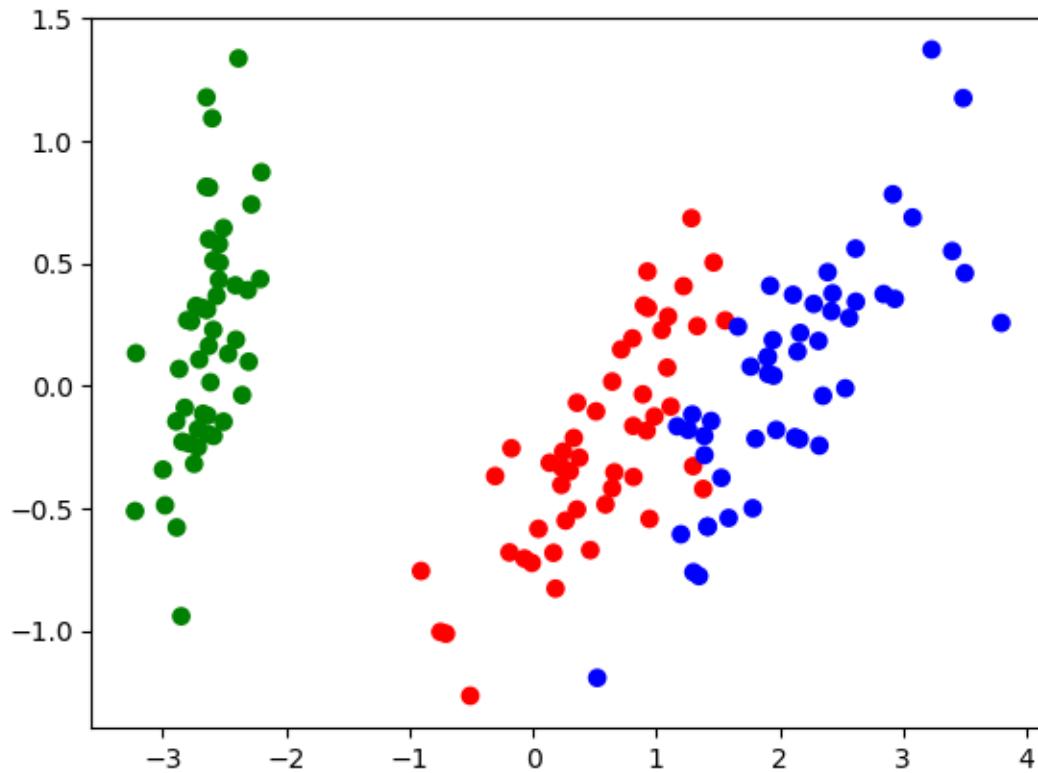
```
[7]: myPca.fit(X)
```

```
[7]: PCA(n_components=2)
```

```
[8]: X_pca = myPca.transform(X)
```

```
[15]: colors = {'setosa' : 'green', 'versicolor' : 'red', 'virginica' : 'blue'}  
  
plt.scatter(X_pca[:,0],X_pca[:,1],c=y.map(colors))
```

```
[15]: <matplotlib.collections.PathCollection at 0x7f0dc346c5b0>
```



```
[14]: X_pca[:,0]
```

```
[14]: array([-2.68412563, -2.71414169, -2.88899057, -2.74534286, -2.72871654,
-2.28085963, -2.82053775, -2.62614497, -2.88638273, -2.6727558 ,
-2.50694709, -2.61275523, -2.78610927, -3.22380374, -2.64475039,
-2.38603903, -2.62352788, -2.64829671, -2.19982032, -2.5879864 ,
-2.31025622, -2.54370523, -3.21593942, -2.30273318, -2.35575405,
-2.50666891, -2.46882007, -2.56231991, -2.63953472, -2.63198939,
-2.58739848, -2.4099325 , -2.64886233, -2.59873675, -2.63692688,
-2.86624165, -2.62523805, -2.80068412, -2.98050204, -2.59000631,
-2.77010243, -2.84936871, -2.99740655, -2.40561449, -2.20948924,
-2.71445143, -2.53814826, -2.83946217, -2.54308575, -2.70335978,
1.28482569, 0.93248853, 1.46430232, 0.18331772, 1.08810326,
0.64166908, 1.09506066, -0.74912267, 1.04413183, -0.0087454 ,
-0.50784088, 0.51169856, 0.26497651, 0.98493451, -0.17392537,
0.92786078, 0.66028376, 0.23610499, 0.94473373, 0.04522698,
1.11628318, 0.35788842, 1.29818388, 0.92172892, 0.71485333,
0.90017437, 1.33202444, 1.55780216, 0.81329065, -0.30558378,
-0.06812649, -0.18962247, 0.13642871, 1.38002644, 0.58800644,
0.80685831, 1.22069088, 0.81509524, 0.24595768, 0.16641322,
0.46480029, 0.8908152 , 0.23054802, -0.70453176, 0.35698149,
0.33193448, 0.37621565, 0.64257601, -0.90646986, 0.29900084,
```

```
2.53119273, 1.41523588, 2.61667602, 1.97153105, 2.35000592,
3.39703874, 0.52123224, 2.93258707, 2.32122882, 2.91675097,
1.66177415, 1.80340195, 2.1655918 , 1.34616358, 1.58592822,
1.90445637, 1.94968906, 3.48705536, 3.79564542, 1.30079171,
2.42781791, 1.19900111, 3.49992004, 1.38876613, 2.2754305 ,
2.61409047, 1.25850816, 1.29113206, 2.12360872, 2.38800302,
2.84167278, 3.23067366, 2.15943764, 1.44416124, 1.78129481,
3.07649993, 2.14424331, 1.90509815, 1.16932634, 2.10761114,
2.31415471, 1.9222678 , 1.41523588, 2.56301338, 2.41874618,
1.94410979, 1.52716661, 1.76434572, 1.90094161, 1.39018886])
```

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