

# 12-03\_GMM

December 6, 2021

```
[1]: import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

```
[3]: from sklearn.datasets import load_iris
data = load_iris()
```

```
[8]: X = data['data'][:,(0,2)]
target = data['target']
```

```
[9]: from sklearn.mixture import GaussianMixture
```

```
[10]: gmm = GaussianMixture(2)
```

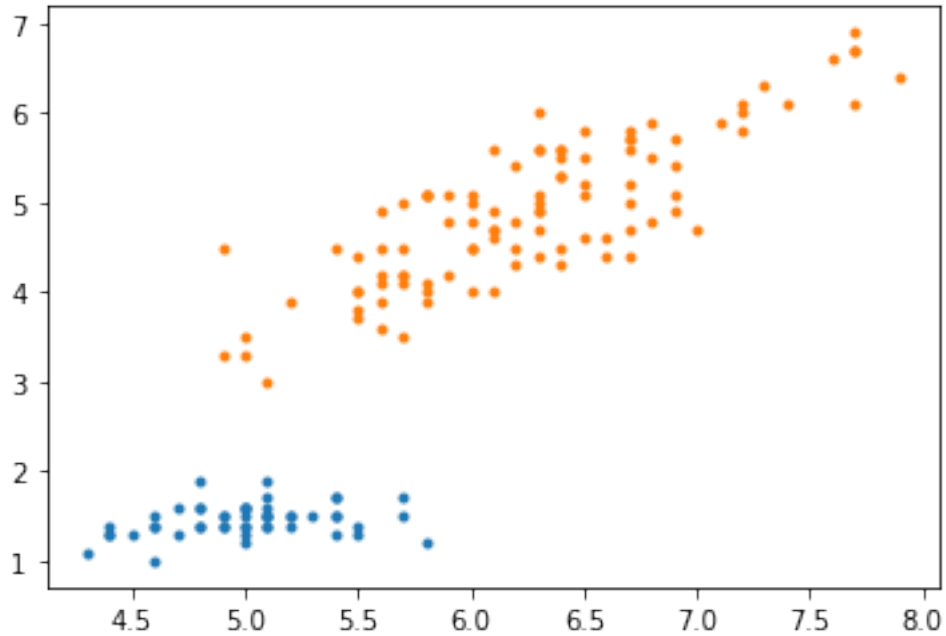
```
[11]: gmm.fit(X)
```

```
[11]: GaussianMixture(n_components=2)
```

```
[13]: pred = gmm.predict(X)
```

```
[15]: plt.plot(X[pred==1,0], X[pred==1,1], '.')
plt.plot(X[pred==0,0], X[pred==0,1], '.')
```

```
[15]: [<matplotlib.lines.Line2D at 0x7f789138c4f0>]
```



```
[22]: gmm.predict_proba(np.array([[5, 2.2]]))
```

```
[22]: array([[0.92564021, 0.07435979]])
```

```
[23]: X = data['data']
```

```
[24]: gmm3 = GaussianMixture(3)
```

```
[25]: gmm3.fit(X)
```

```
[25]: GaussianMixture(n_components=3)
```

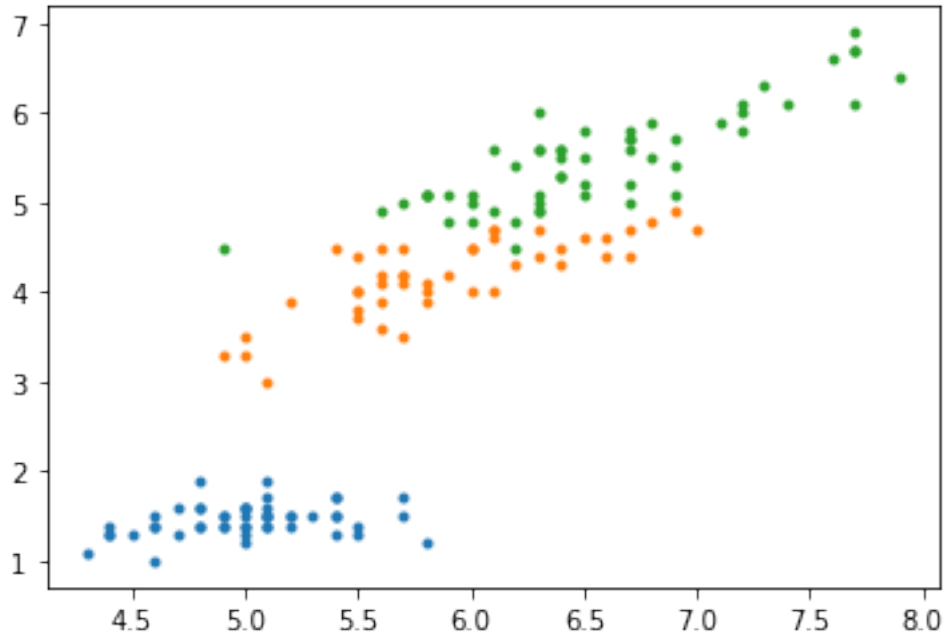
```
[28]: pred = gmm3.predict(X)
```

```
[29]: plt.plot(X[pred==0,0], X[pred==0,2], '.')
```

```
plt.plot(X[pred==1,0], X[pred==1,2], '.')
```

```
plt.plot(X[pred==2,0], X[pred==2,2], '.')
```

```
[29]: [<matplotlib.lines.Line2D at 0x7f78912cdd00>]
```

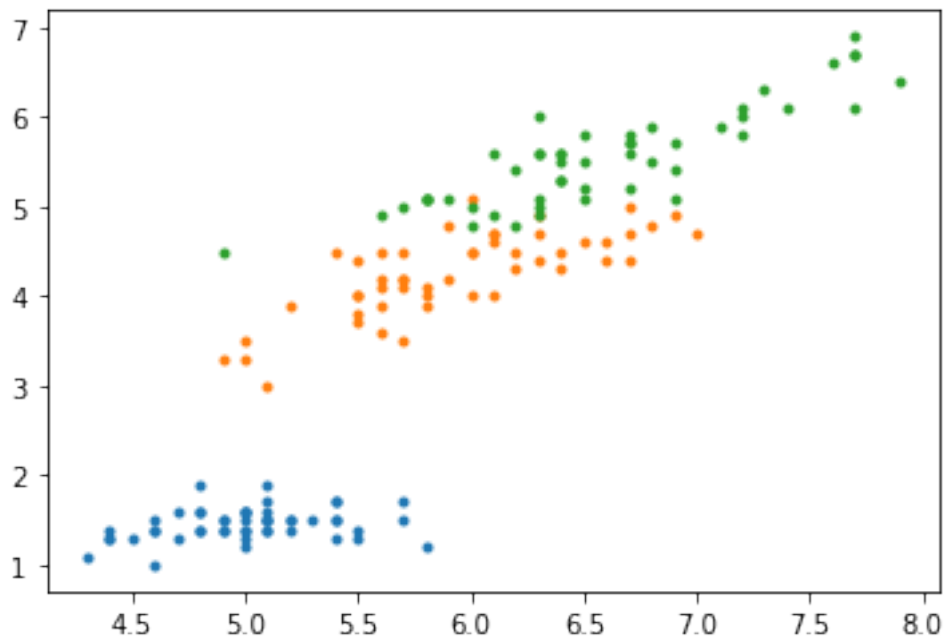


```
[30]: plt.plot(X[target==0,0], X[target==0,2], '.')
```

```
plt.plot(X[target==1,0], X[target==1,2], '.')
```

```
plt.plot(X[target==2,0], X[target==2,2], '.')
```

[30]: [[matplotlib.lines.Line2D](#) at 0x7f7891236a30>]



```
[33]: np.sum(pred != target)
```

```
[33]: 5
```

```
[34]: target.size
```

```
[34]: 150
```

```
[35]: np.sum(pred != target) / target.size
```

```
[35]: 0.03333333333333333
```

```
[ ]:
```