

## classifier\_starter

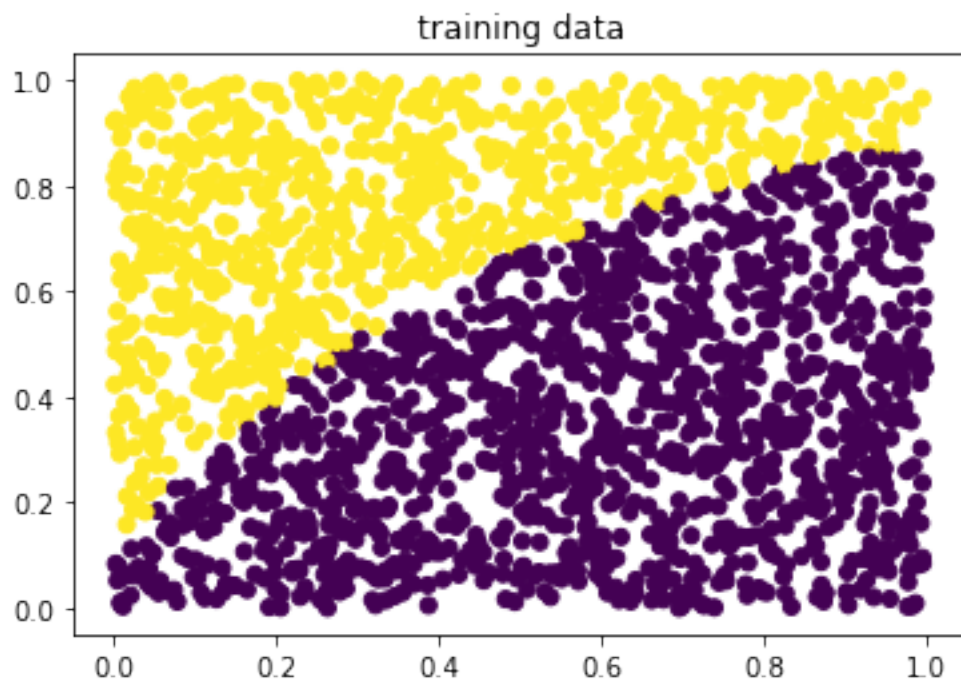
April 11, 2022

```
[5]: import numpy as np
import matplotlib.pyplot as plt
import pickle

pkl_file = open('classifier_data.pkl', 'rb')
x_train, y_train = pickle.load(pkl_file)

n_train = np.size(y_train)

plt.scatter(x_train[:,0],x_train[:,1], c=y_train[:,0])
plt.title('training data')
plt.show()
```



```
[6]: def gradient(w,l):
      return np.sum([-1 * y_train.T @ x_train / (1 + np.exp(-1 * y_train.T @
      ↪x_train @ w))]) + 2 * l * w

      def gradient_descent(starting_w,l):
          w_current = starting_w
          tau = (2/(np.linalg.norm(x_train, 2)**2))/2
          for i in range(100):
              w_current += -1.0 * tau * gradient(w_current,l)

          return w_current
```

```
[33]: gradient_descent(np.array([[.5],[.5]],float),1)
```

```
[33]: array([[0.41970883],
             [0.41970883]])
```

```
[23]: tau = (2/(np.linalg.norm(x_train, 2)**2))/2
```