

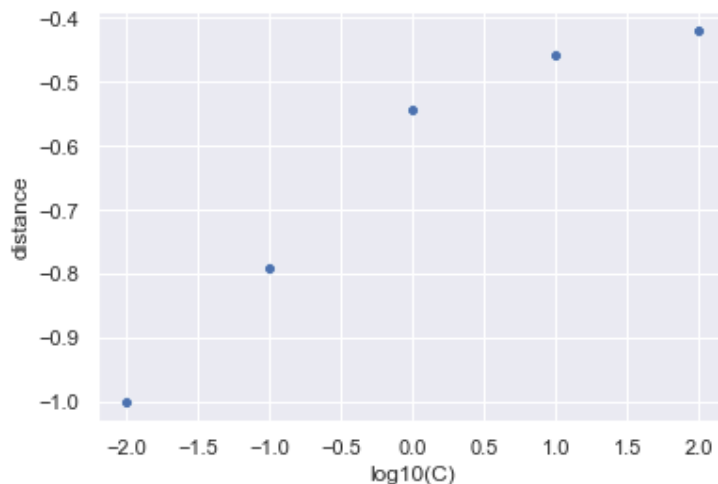
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In [107]: import numpy as np
from sklearn import svm
import matplotlib.pyplot as plt
import pandas as pd
```

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In [108]: data_train = pd.read_csv("data_train.csv")
data_test = pd.read_csv("data_test.csv")
X = data_train[['intensity', 'symmetry']]
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In [109]: y0 = np.where(data_train["digit"] == 0, 1, -1)
Clist = [-2, -1, 0, 1, 2]
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In [114]: d = []
for c in Clist:
    result = svm.SVC(C = 10**c, kernel = "rbf", gamma = 80).fit(X,y0)
    K = [ind for ind, coef in enumerate(abs(result.dual_coef_[0])) if coef > 0 and c
    d = d + [result.decision_function(result.support_vectors_[K]).mean()]
```

```
In [115]: import seaborn as sns; sns.set()
import matplotlib.pyplot as plt
df=pd.DataFrame({'log10(C)': Clist, 'distance': d})
ax = sns.scatterplot(x='log10(C)', y='distance', data=df)
```



```
In [116]: print(d)

[-0.999999999909325, -0.7913669064515877, -0.5438596462353715, -0.4561797012906053
7, -0.42000005999788637]
```

Q15: The distance to the hyperplane is increasing in C, implying that the classifier could tolerate more error observations.

In []:

