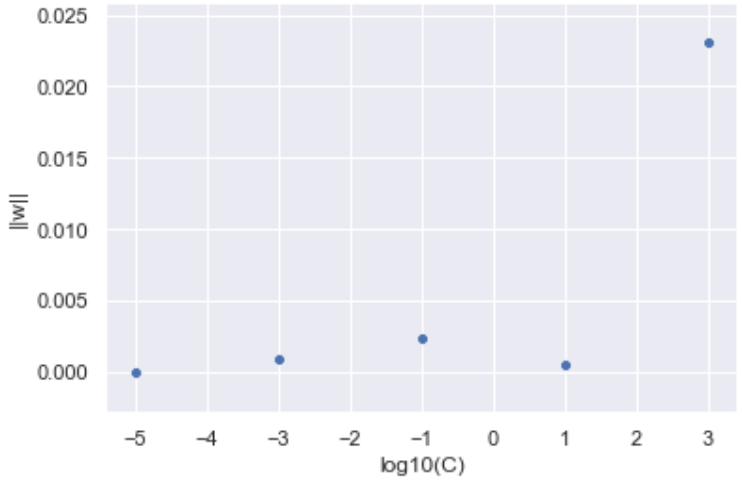
In [1]:
```
import numpy as np
from sklearn import svm
import matplotlib.pyplot as plt
import pandas as pd
```

In [2]:
```
data_train = pd.read_csv("data_train.csv")
data_test = pd.read_csv("data_test.csv")
X = data_train[['intensity','symmetry']]
```

In [3]:
```
y2 = np.where(data_train["digit"] ==2, 1 ,-1)
Clist = [-5,-3,-1,1,3]
```

In [4]:
```
w = []
for c in Clist:
    result = svm.SVC(C = 10**c, kernel = "linear").fit(X,y2)
    w = w +[np.linalg.norm(result.coef_)]
```

In [5]:
```
import seaborn as sns; sns.set()
import matplotlib.pyplot as plt
df=pd.DataFrame({'log10(C)': Clist, '||w||': w})
ax = sns.scatterplot(x='log10(C)', y='||w||',data=df)
```



In [6]:
```
w
```

Out[6]:
```
[1.1763105414828839e-05,
 0.0009147796947899397,
 0.002331791308596588,
 0.000513661010677975,
 0.023067043402405518]
```

Q13: The norm of the weight is not always increasing with C