**CODE**

```
from sklearn.datasets import fetch_20newsgroups


data = fetch_20newsgroups()

data.target_names


categories = ['rec.motorcycles', 'soc.religion.christian',

        'sci.crypt', 'comp.graphics']

train = fetch_20newsgroups(subset='train', categories=categories)

test = fetch_20newsgroups(subset='test', categories=categories)


print(train.data[8])


from sklearn.feature_extraction.text import TfidfVectorizer

from sklearn.naive_bayes import MultinomialNB

from sklearn.pipeline import make_pipeline


model = make_pipeline(TfidfVectorizer(), MultinomialNB())


model.fit(train.data, train.target)

labels = model.predict(test.data)


from sklearn.metrics import confusion_matrix

import seaborn as sns

import matplotlib as plt

mat = confusion_matrix(test.target, labels)

sns.heatmap(mat.T, square=True, annot=True, fmt='d', cbar=False, xticklabels=train.target_names,
yticklabels=train.target_names)
```

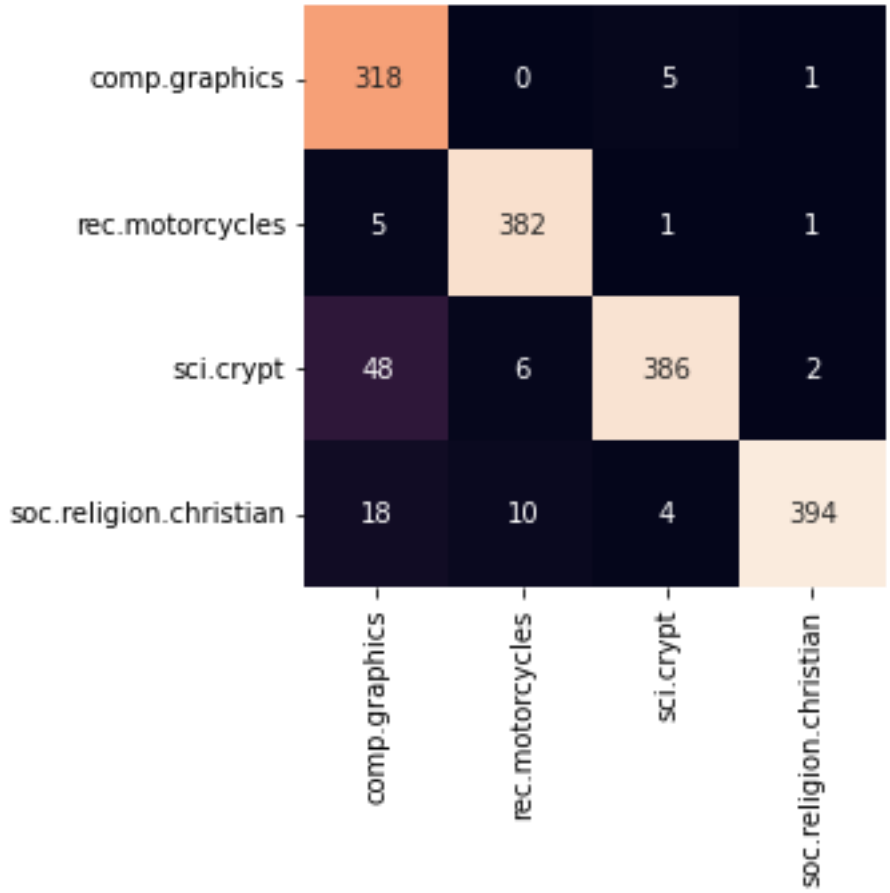
**OUTPUT**

```
['alt.atheism',
 'comp.graphics',
 'comp.os.ms-windows.misc',
 'comp.sys.ibm.pc.hardware',
 'comp.sys.mac.hardware',
 'comp.windows.x',
 'misc.forsale',
 'rec.autos',
 'rec.motorcycles',
 'rec.sport.baseball',
 'rec.sport.hockey',
 'sci.crypt',
 'sci.electronics',
 'sci.med',
 'sci.space',
 'soc.religion.christian',
 'talk.politics.guns',
 'talk.politics.mideast',
 'talk.politics.misc',
 'talk.religion.misc']
```

```
From: cds7k@Virginia.EDU (Christopher Douglas Saady)
Subject: Re: Looking for MOVIES w/ BIKES
Organization: University of Virginia
Lines: 4

There's also Billy Jack, The Wild One, Smokey and the Bandit
(Where Jerry Reed runs his truck over Motorcycle Gangs Bikes),
and a video tape documentary on the Hell's Angels I
found in a rental store once
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f78b9005bd0>
```


comp.graphics
rec.motorcycles
sci.crypt
soc.religion.christian
318
0
5
1
5
382
1
1
48
6
386
2
18
10
4
394
comp.graphics
rec.motorcycles
sci.crypt
soc.religion.christian