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In [34]: import numpy as np
import pandas as pd

from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder

from sklearn.linear_model import LogisticRegression
from sklearn.svm import SVC
from sklearn.neural_network import MLPClassifier

from sklearn.metrics import f1_score

In [2]: spam = pd.read_csv("C:/Users/77son/Downloads/spam.csv",encoding = "latin-1")

In [3]: spam.head()

Out[3]:
```

	v1	v2	Unnamed: 2	Unnamed: 3	Unnamed: 4
0	ham	Go until jurong point, crazy.. Available only ...	NaN	NaN	NaN
1	ham	Ok lar... Joking wif u oni...	NaN	NaN	NaN
2	spam	Free entry in 2 a wkly comp to win FA Cup fina...	NaN	NaN	NaN
3	ham	U dun say so early hor... U c already then say...	NaN	NaN	NaN
4	ham	Nah I don't think he goes to usf, he lives aro...	NaN	NaN	NaN

```
In [4]: spam.drop([spam.columns[col] for col in range(2,5)],axis=1,inplace=True)

In [5]: spam

Out[5]:
```

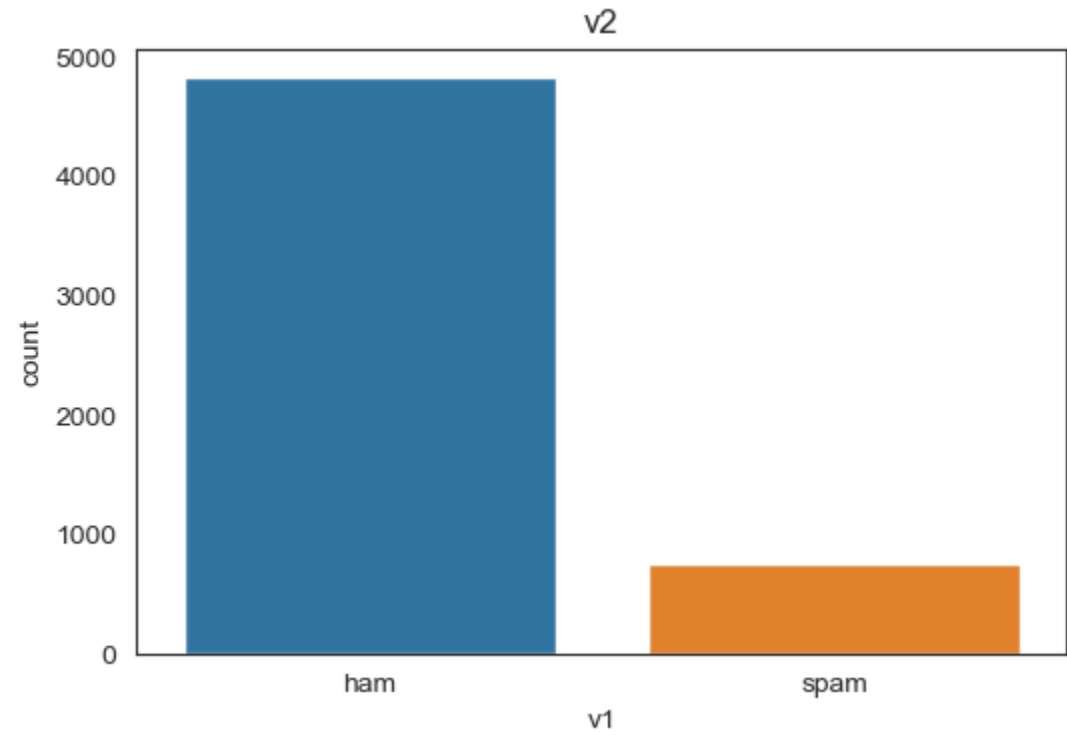
	v1	v2
0	ham	Go until jurong point, crazy.. Available only ...
1	ham	Ok lar... Joking wif u oni...
2	spam	Free entry in 2 a wkly comp to win FA Cup fina...
3	ham	U dun say so early hor... U c already then say...
4	ham	Nah I don't think he goes to usf, he lives aro...
...
5567	spam	This is the 2nd time we have tried 2 contact u...
5568	ham	Will i_b going to esplanade fr home?
5569	ham	Pity, * was in mood for that. So...any other s...
5570	ham	The guy did some bitching but I acted like i'd...
5571	ham	Rofl. Its true to its name

5572 rows × 2 columns

```
In [6]: spam.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5572 entries, 0 to 5571
Data columns (total 2 columns):
#   Column  Non-Null Count  Dtype
---  -
0    v1      5572 non-null    object
1    v2      5572 non-null    object
dtypes: object(2)
memory usage: 87.2+ KB

In [10]: # Visualize spam frequenices
plt.figure(dpi=100)
sns.countplot(spam['v1'])
plt.title("v2")
plt.show()
```



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In [11]: # Check for missing data for each column
spam.isnull().sum()

v1    0
v2    0
dtype: int64

In [12]: # Check for duplicates and remove them
spam.drop_duplicates(inplace=True)

In [16]: # Model creation
model = MultinomialNB()

In [21]: spam.describe()

Out[21]:
```

	v1	v2
count	5169	5169
unique	2	5169
top	ham	Go until jurong point, crazy.. Available only ...
freq	4516	1

```
In [22]: spam.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 5169 entries, 0 to 5571
Data columns (total 2 columns):
#   Column  Non-Null Count  Dtype
---  -
0    v1      5169 non-null    object
1    v2      5169 non-null    object
dtypes: object(2)
memory usage: 121.1+ KB

In [23]: spam.shape

Out[23]: (5169, 2)

In [24]: spam.size

Out[24]: 10338

In [25]: spam

Out[25]:
```

	v1	v2
0	ham	Go until jurong point, crazy.. Available only ...
1	ham	Ok lar... Joking wif u oni...
2	spam	Free entry in 2 a wkly comp to win FA Cup fina...
3	ham	U dun say so early hor... U c already then say...
4	ham	Nah I don't think he goes to usf, he lives aro...
...
5567	spam	This is the 2nd time we have tried 2 contact u...
5568	ham	Will i_b going to esplanade fr home?
5569	ham	Pity, * was in mood for that. So...any other s...
5570	ham	The guy did some bitching but I acted like i'd...
5571	ham	Rofl. Its true to its name

5169 rows × 2 columns

```
In [26]: spam.tail()

Out[26]:
```

	v1	v2
5567	spam	This is the 2nd time we have tried 2 contact u...
5568	ham	Will i_b going to esplanade fr home?
5569	ham	Pity, * was in mood for that. So...any other s...
5570	ham	The guy did some bitching but I acted like i'd...
5571	ham	Rofl. Its true to its name

```
In [28]: y=spam['v1']

In [29]: y

Out[29]:
```

0	ham
1	ham
2	spam
3	ham
4	ham
...	...
5567	spam
5568	ham
5569	ham
5570	ham
5571	ham

Name: v1, Length: 5169, dtype: object

```
In [30]: x=spam['v2']

In [31]: x

Out[31]:
```

0	Go until jurong point, crazy.. Available only ...
1	Ok lar... Joking wif u oni...
2	Free entry in 2 a wkly comp to win FA Cup fina...
3	U dun say so early hor... U c already then say...
4	Nah I don't think he goes to usf, he lives aro...
...	...
5567	This is the 2nd time we have tried 2 contact u...
5568	Will i_b going to esplanade fr home?
5569	Pity, * was in mood for that. So...any other s...
5570	The guy did some bitching but I acted like i'd...
5571	Rofl. Its true to its name

Name: v2, Length: 5169, dtype: object

```
In [32]: spam.columns

Out[32]: Index(['v1', 'v2'], dtype='object')

In [33]: #evaluating missing values
spam.isnull().sum()

Out[33]:
```

v1	0
v2	0

dtype: int64

```
In [ ]:
```