```
import nltk                                  # Python library for NLP
import matplotlib.pyplot as plt              # library for visualization
import random                                # pseudo-random number generator
data=pd.read_csv('/content/datasets_3901_6113_sms_spam.csv')


a=data.loc[data['type'] == 'spam']
b=data.loc[data['type'] == 'ham']
```

+ Code + Text

```
print('Number of spam sms: ', len(a))
print('Number of ham sms: ', len(b))

print('\nThe type of a is: ', type(a))
print('The type of an sms entry is: ', type(a.iloc[0]))
```

```
Number of spam sms:  747
Number of ham sms:  4812

The type of a is:  <class 'pandas.core.frame.DataFrame'>
The type of an sms entry is:  <class 'pandas.core.series.Series'>
```

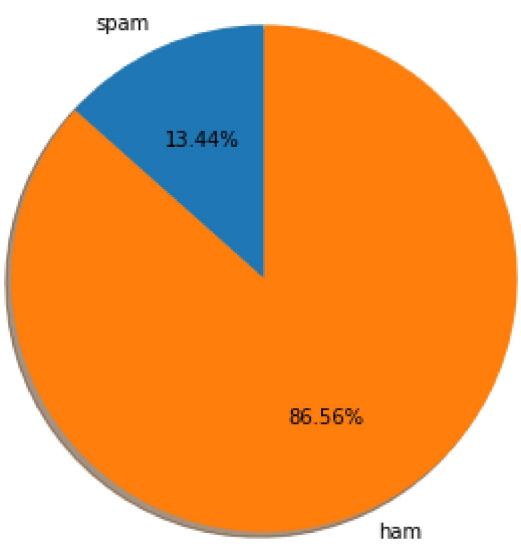
```
fig = plt.figure(figsize=(5, 5))

labels = 'spam','ham'

sizes = [len(a),len(b)]

# Declare pie chart, where the slices will be ordered and plotted counter-clockwise:
plt.pie(sizes, labels=labels, autopct='%.2f%%',
        shadow=True, startangle=90)

plt.axis('equal')
plt.show()
```



```
print('\033[91m'+'spam     :' + a.iloc[random.randint(0,700)].text)
print('\033[92m' + 'ham      :' + b.iloc[random.randint(0,700)].text)
```

```
spam     :Claim a 200 shopping spree, just call 08717895698 now! Have you won! MobStore(
ham      :Ok.ok ok..then..whats ur todays plan
```

```
# Our selected sample
sample_spam=a.iloc[random.randint(0,700)].text
print(sample_spam)
```

```
Todays Voda numbers ending 7548 are selected to receive a $350 award. If you have a matc
```

```
# download the stopwords from NLTK
nltk.download('stopwords')
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Unzipping corpora/stopwords.zip.
True
```

```
import re                                  # library for regular expression operations
import string                              # for string operations

from nltk.corpus import stopwords          # module for stop words that come with NLTK
from nltk.stem import PorterStemmer        # module for stemming
from nltk.tokenize import TweetTokenizer   # module for tokenizing strings
```

```
print('\033[92m' + sample_spam)
print('\033[94m')

# remove hyperlinks
sample_spam2 = re.sub(r'(\$)*[0-9](\.[0-9]+)?', '', sample_spam)
```

```
print(sample_spam2)
```

```
Todays Voda numbers ending 7548 are selected to receive a $350 award. If you have a matc

Todays Voda numbers ending  are selected to receive a  award. If you have a match please
```

```
print()
print('\033[92m' + sample_spam2)
print('\033[94m')

# instantiate tokenizer class
tokenizer = TweetTokenizer(preserve_case=False)

# tokenize tweets
```

```
sms_tokens = tokenizer.tokenize(sample_spam2)

print()
print('Tokenized string:')
print(sms_tokens)
```

```
Todays Voda numbers ending  are selected to receive a  award. If you have a match please


Tokenized string:
['todays', 'voda', 'numbers', 'ending', 'are', 'selected', 'to', 'receive', 'a', 'award
```

```
#Import the english stop words list from NLTK
stopwords_english = stopwords.words('english')

print('Stop words\n')
print(stopwords_english)

print('\nPunctuation\n')
print(string.punctuation)
```

```
Stop words

['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', "you're", "you've",

Punctuation

!"#$%&'()*+,-./:;<=>?@[\]^_`{|}~
```

```
print()
print('\033[92m')
print(sms_tokens)
print('\033[94m')

sms_clean = []

for word in sms_tokens: # Go through every word in your tokens list
    if (word not in stopwords_english and  # remove stopwords
        word not in string.punctuation):  # remove punctuation
        sms_clean.append(word)

print('removed stop words and punctuation:')
print(sms_clean)
```

```
['todays' 'voda' 'numbers' 'ending' 'are' 'selected' 'to' 'receive' 'a' 'award
```

```
print()
print('\033[92m')
print(sms_clean)
print('\033[94m')

# Instantiate stemming class
stemmer = PorterStemmer()

# Create an empty list to store the stems
sms_stem = []

for word in sms_clean:
    stem_word = stemmer.stem(word)  # stemming word
    sms_stem.append(stem_word)  # append to the list

print('stemmed words:')
print(sms_stem)
```

```
['todays', 'voda', 'numbers', 'ending', 'selected', 'receive', 'award', 'match', 'please

stemmed words:
['today', 'voda', 'number', 'end', 'select', 'receiv', 'award', 'match', 'pleas', 'call
```