```
# This Python 3 environment comes with many helpful analytics
libraries installed
# It is defined by the kaggle/python docker image:
https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load in

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import matplotlib.pyplot as plt # for data visualization
import seaborn as sns # for statistical data visualization
%matplotlib inline

# Input data files are available in the "../input/" directory.
# For example, running this (by clicking run or pressing Shift+Enter)
will list all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

        # Any results you write to the current directory are saved as
output.

import warnings

warnings.filterwarnings('ignore')

data = (r'C:\Users\Sreevidya\Desktop\ML\k means\live.csv')

df = pd.read_csv(data)

df.shape

(7050, 16)

df.head()

                          status_id status_type status_published  \
0  246675545449582_1649696485147474       video   4/22/2018 6:00
1  246675545449582_1649426988507757       photo  4/21/2018 22:45
2  246675545449582_1648730588577397       video   4/21/2018 6:17
3  246675545449582_1648576705259452       photo   4/21/2018 2:29
4  246675545449582_1645700502213739       photo   4/18/2018 3:22

   num_reactions  num_comments  num_shares  num_likes  num_loves
num_wows  \
0            529           512         262        432         92
3
1            150             0           0        150          0
0
```

```
2          227          236          57          204          21
1
3          111            0           0          111           0
0
4          213            0           0          204           9
0

   num_hahas  num_sads  num_angrys  Column1  Column2  Column3  Column4

0          1         1           0      NaN      NaN      NaN      NaN

1          0         0           0      NaN      NaN      NaN      NaN

2          1         0           0      NaN      NaN      NaN      NaN

3          0         0           0      NaN      NaN      NaN      NaN

4          0         0           0      NaN      NaN      NaN      NaN
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7050 entries, 0 to 7049
Data columns (total 16 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   status_id         7050 non-null   object
 1   status_type       7050 non-null   object
 2   status_published  7050 non-null   object
 3   num_reactions     7050 non-null   int64
 4   num_comments      7050 non-null   int64
 5   num_shares        7050 non-null   int64
 6   num_likes         7050 non-null   int64
 7   num_loves         7050 non-null   int64
 8   num_wows          7050 non-null   int64
 9   num_hahas         7050 non-null   int64
 10  num_sads          7050 non-null   int64
 11  num_angrys        7050 non-null   int64
 12  Column1           0 non-null      float64
 13  Column2           0 non-null      float64
 14  Column3           0 non-null      float64
 15  Column4           0 non-null      float64
dtypes: float64(4), int64(9), object(3)
memory usage: 881.4+ KB
```

```
df.isnull().sum()
```

```
status_id           0
status_type         0
status_published    0
```

```
num_reactions          0
num_comments           0
num_shares             0
num_likes              0
num_loves              0
num_wows               0
num_hahas              0
num_sads               0
num_angrys             0
Column1             7050
Column2             7050
Column3             7050
Column4             7050
dtype: int64
```

```
df.drop(['Column1', 'Column2', 'Column3', 'Column4'], axis=1,
inplace=True)
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7050 entries, 0 to 7049
Data columns (total 12 columns):
 #   Column            Non-Null Count  Dtype 
---  ------            --------------  ----- 
 0   status_id         7050 non-null   object
 1   status_type       7050 non-null   object
 2   status_published  7050 non-null   object
 3   num_reactions     7050 non-null   int64 
 4   num_comments      7050 non-null   int64 
 5   num_shares        7050 non-null   int64 
 6   num_likes         7050 non-null   int64 
 7   num_loves         7050 non-null   int64 
 8   num_wows          7050 non-null   int64 
 9   num_hahas         7050 non-null   int64 
 10  num_sads          7050 non-null   int64 
 11  num_angrys        7050 non-null   int64 
dtypes: int64(9), object(3)
memory usage: 661.1+ KB
```

```
df.describe()
```

```
       num_reactions  num_comments   num_shares    num_likes
num_loves  \
count    7050.000000   7050.000000  7050.000000  7050.000000
7050.000000
mean      230.117163    224.356028    40.022553   215.043121
12.728652
std       462.625309    889.636820   131.599965   449.472357
39.972930
```

```
min          0.000000      0.000000     0.000000     0.000000
0.000000
25%         17.000000      0.000000     0.000000    17.000000
0.000000
50%         59.500000      4.000000     0.000000    58.000000
0.000000
75%        219.000000     23.000000     4.000000   184.750000
3.000000
max       4710.000000  20990.000000  3424.000000  4710.000000
657.000000

          num_wows    num_hahas     num_sads   num_angrys
count  7050.000000  7050.000000  7050.000000  7050.000000
mean      1.289362     0.696454     0.243688     0.113191
std       8.719650     3.957183     1.597156     0.726812
min       0.000000     0.000000     0.000000     0.000000
25%       0.000000     0.000000     0.000000     0.000000
50%       0.000000     0.000000     0.000000     0.000000
75%       0.000000     0.000000     0.000000     0.000000
max     278.000000   157.000000    51.000000    31.000000
```

```
# view the labels in the variable

df['status_id'].unique()
```

```
array(['246675545449582_1649696485147474',
       '246675545449582_1649426988507757',
       '246675545449582_1648730588577397', ...,
       '1050855161656896_1060126464063099',
       '1050855161656896_1058663487542730',
       '1050855161656896_1050858841656528'], dtype=object)
```

```
# view how many different types of variables are there

len(df['status_id'].unique())
```

```
6997
```

```
# view the labels in the variable

df['status_published'].unique()
```

```
array(['4/22/2018 6:00', '4/21/2018 22:45', '4/21/2018 6:17', ...,
       '9/21/2016 23:03', '9/20/2016 0:43', '9/10/2016 10:30'],
      dtype=object)
```

```
# view how many different types of variables are there

len(df['status_published'].unique())
```

```
6913
```

```
# view the labels in the variable

df['status_type'].unique()

array(['video', 'photo', 'link', 'status'], dtype=object)

# view how many different types of variables are there

len(df['status_type'].unique())

4

df.drop(['status_id', 'status_published'], axis=1, inplace=True)

df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7050 entries, 0 to 7049
Data columns (total 10 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   status_type    7050 non-null   object
 1   num_reactions  7050 non-null   int64
 2   num_comments   7050 non-null   int64
 3   num_shares     7050 non-null   int64
 4   num_likes      7050 non-null   int64
 5   num_loves      7050 non-null   int64
 6   num_wows       7050 non-null   int64
 7   num_hahas      7050 non-null   int64
 8   num_sads       7050 non-null   int64
 9   num_angrys     7050 non-null   int64
dtypes: int64(9), object(1)
memory usage: 550.9+ KB

df.head()

  status_type  num_reactions  num_comments  num_shares  num_likes
num_loves  \
0       video            529           512         262        432
92
1       photo            150             0           0        150
0
2       video            227           236          57        204
21
3       photo            111             0           0        111
0
4       photo            213             0           0        204
9

   num_wows  num_hahas  num_sads  num_angrys
0         3          1         1           0
```

```
1         0          0         0           0
2         1          1         0           0
3         0          0         0           0
4         0          0         0           0
```

```
X = df

y = df['status_type']

from sklearn.preprocessing import LabelEncoder

le = LabelEncoder()

X['status_type'] = le.fit_transform(X['status_type'])

y = le.transform(y)

X.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7050 entries, 0 to 7049
Data columns (total 10 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   status_type    7050 non-null   int32
 1   num_reactions  7050 non-null   int64
 2   num_comments   7050 non-null   int64
 3   num_shares     7050 non-null   int64
 4   num_likes      7050 non-null   int64
 5   num_loves      7050 non-null   int64
 6   num_wows       7050 non-null   int64
 7   num_hahas      7050 non-null   int64
 8   num_sads       7050 non-null   int64
 9   num_angrys     7050 non-null   int64
dtypes: int32(1), int64(9)
memory usage: 523.4 KB
```

```
X.head()
```

```
   status_type  num_reactions  num_comments  num_shares  num_likes
num_loves  \
0            3            529           512         262        432
92
1            1            150             0           0        150
0
2            3            227           236          57        204
21
3            1            111             0           0        111
0
4            1            213             0           0        204
9
```

```
   num_wows  num_hahas  num_sads  num_angrys
0         3          1         1           0
1         0          0         0           0
2         1          1         0           0
3         0          0         0           0
4         0          0         0           0
```

```
cols = X.columns

from sklearn.preprocessing import MinMaxScaler

ms = MinMaxScaler()

X = ms.fit_transform(X)

X = pd.DataFrame(X, columns=[cols])

X.head()
```

```
  status_type num_reactions num_comments num_shares num_likes
num_loves  \
0    1.000000      0.112314     0.024393   0.076519  0.091720
0.140030
1    0.333333      0.031847     0.000000   0.000000  0.031847
0.000000
2    1.000000      0.048195     0.011243   0.016647  0.043312
0.031963
3    0.333333      0.023567     0.000000   0.000000  0.023567
0.000000
4    0.333333      0.045223     0.000000   0.000000  0.043312
0.013699

   num_wows num_hahas  num_sads num_angrys
0  0.010791  0.006369  0.019608        0.0
1  0.000000  0.000000  0.000000        0.0
2  0.003597  0.006369  0.000000        0.0
3  0.000000  0.000000  0.000000        0.0
4  0.000000  0.000000  0.000000        0.0
```

```
from sklearn.cluster import KMeans

kmeans = KMeans(n_clusters=2, random_state=0)

kmeans.fit(X)
```

```
KMeans(n_clusters=2, random_state=0)
```

```
kmeans.cluster_centers_
```

```
array([[9.54921576e-01, 6.46330441e-02, 2.67028654e-02, 2.93171709e-
02,
        5.71231462e-02, 4.71007076e-02, 8.18581889e-03, 9.65207685e-
03,
        8.04219428e-03, 7.19501847e-03],
       [3.28506857e-01, 3.90710874e-02, 7.54854864e-04, 7.53667113e-
04,
        3.85438884e-02, 2.17448568e-03, 2.43721364e-03, 1.20039760e-
03,
        2.75348016e-03, 1.45313276e-03]])
```

```
kmeans.inertia_
```

```
237.75726404419646
```

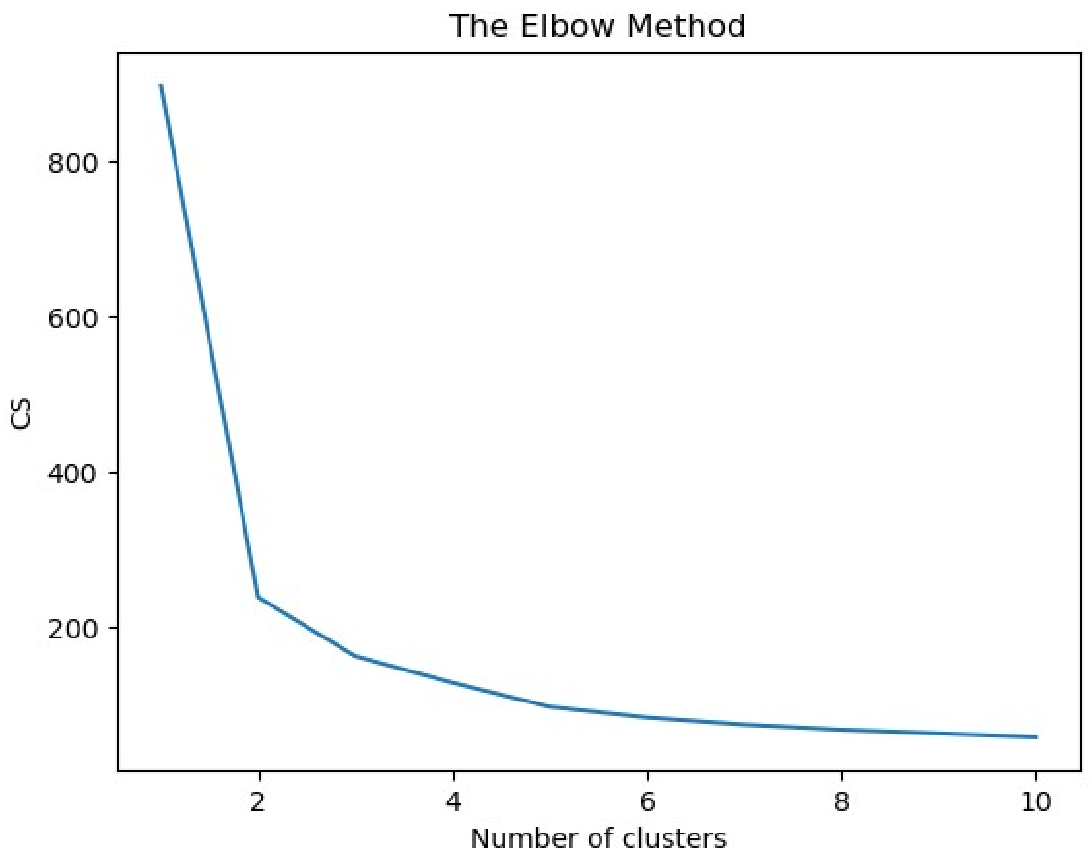
```
labels = kmeans.labels_

# check how many of the samples were correctly labeled
correct_labels = sum(y == labels)

print("Result: %d out of %d samples were correctly labeled." %
(correct_labels, y.size))
```

```
Result: 4288 out of 7050 samples were correctly labeled.
```

```
print('Accuracy score: {0:0.2f}'.
format(correct_labels/float(y.size)))
```

```
Accuracy score: 0.61
```

```
from sklearn.cluster import KMeans
cs = []
for i in range(1, 11):
    kmeans = KMeans(n_clusters = i, init = 'k-means++', max_iter =
300, n_init = 10, random_state = 0)
    kmeans.fit(X)
    cs.append(kmeans.inertia_)
plt.plot(range(1, 11), cs)
plt.title('The Elbow Method')
plt.xlabel('Number of clusters')
plt.ylabel('CS')
plt.show()
```



```
from sklearn.cluster import KMeans

kmeans = KMeans(n_clusters=2,random_state=0)

kmeans.fit(X)

labels = kmeans.labels_

# check how many of the samples were correctly labeled

correct_labels = sum(y == labels)

print("Result: %d out of %d samples were correctly labeled." %
(correct_labels, y.size))
print('Accuracy score: {0:0.2f}'.
format(correct_labels/float(y.size)*100))

Result: 4288 out of 7050 samples were correctly labeled.
Accuracy score: 60.82

kmeans = KMeans(n_clusters=3, random_state=0)

kmeans.fit(X)
```

```
# check how many of the samples were correctly labeled
labels = kmeans.labels_

correct_labels = sum(y == labels)
print("Result: %d out of %d samples were correctly labeled." %
(correct_labels, y.size))
print('Accuracy score: {0:0.2f}'.
format(correct_labels/float(y.size)*100))
```

```
Result: 4165 out of 7050 samples were correctly labeled.
Accuracy score: 59.08
```

```
kmeans = KMeans(n_clusters=4, random_state=0)

kmeans.fit(X)

# check how many of the samples were correctly labeled
labels = kmeans.labels_

correct_labels = sum(y == labels)
print("Result: %d out of %d samples were correctly labeled." %
(correct_labels, y.size))
print('Accuracy score: {0:0.2f}'.
format(correct_labels/float(y.size)*100))
```

```
Result: 4347 out of 7050 samples were correctly labeled.
Accuracy score: 61.66
```