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
```

In [ ]:

```
data = './Live.csv'

df = pd.read_csv(data)
```

In [ ]:

```
df.head()
```

Out[ ]:

	status_id	status_type	status_published	num_reactions	num_comments
0	246675545449582_1649696485147474	video	4/22/2018 6:00	529	512
1	246675545449582_1649426988507757	photo	4/21/2018 22:45	150	0
2	246675545449582_1648730588577397	video	4/21/2018 6:17	227	236
3	246675545449582_1648576705259452	photo	4/21/2018 2:29	111	0
4	246675545449582_1645700502213739	photo	4/18/2018 3:22	213	0

In [ ]:

```
print(df.shape)
print(df.info())
```

```
(7050, 16)
<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
None
```

In [ ]:

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

Out[ ]:
```
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
```

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

Out[ ]:
```
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
dtype: int64
```

In [ ]:
```
df.describe()
```

Out[ ]:

	num_reactions	num_comments	num_shares	num_likes	num_loves	num_wows	num_hah
count	7050.000000	7050.000000	7050.000000	7050.000000	7050.000000	7050.000000	7050.00000
mean	230.117163	224.356028	40.022553	215.043121	12.728652	1.289362	0.69645
std	462.625309	889.636820	131.599965	449.472357	39.972930	8.719650	3.95718
min	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
25%	17.000000	0.000000	0.000000	17.000000	0.000000	0.000000	0.00000
50%	59.500000	4.000000	0.000000	58.000000	0.000000	0.000000	0.00000
75%	219.000000	23.000000	4.000000	184.750000	3.000000	0.000000	0.00000
max	4710.000000	20990.000000	3424.000000	4710.000000	657.000000	278.000000	157.00000

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

In [ ]:
```
X = df
```

```
y = df['status_type']
```

In [ ]:

```
from sklearn.preprocessing import LabelEncoder

le = LabelEncoder()

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

y = le.transform(y)
```

In [ ]:

```
X.head()
```

Out[ ]:

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

In [ ]:

```
cols = X.columns
```

In [ ]:

```
from sklearn.preprocessing import MinMaxScaler

ms = MinMaxScaler()

X = ms.fit_transform(X)
```

In [ ]:

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

In [ ]:

```
X.head()
```

Out[ ]:

	status_type	num_reactions	num_comments	num_shares	num_likes	num_loves	num_wows	num_l
0	1.000000	0.112314	0.024393	0.076519	0.091720	0.140030	0.010791	0.0
1	0.333333	0.031847	0.000000	0.000000	0.031847	0.000000	0.000000	0.0
2	1.000000	0.048195	0.011243	0.016647	0.043312	0.031963	0.003597	0.0
3	0.333333	0.023567	0.000000	0.000000	0.023567	0.000000	0.000000	0.0
4	0.333333	0.045223	0.000000	0.000000	0.043312	0.013699	0.000000	0.0

In [ ]:

```
from sklearn.cluster import KMeans

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

kmeans.fit(X)
```

Out[ ]:

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

In [ ]:

```python
kmeans.cluster_centers_
```

Out[ ]:

```
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]])
```

In [ ]:

```python
kmeans.inertia_
```

Out[ ]:

```
237.75726404419564
```

In [ ]:

```python
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.
```

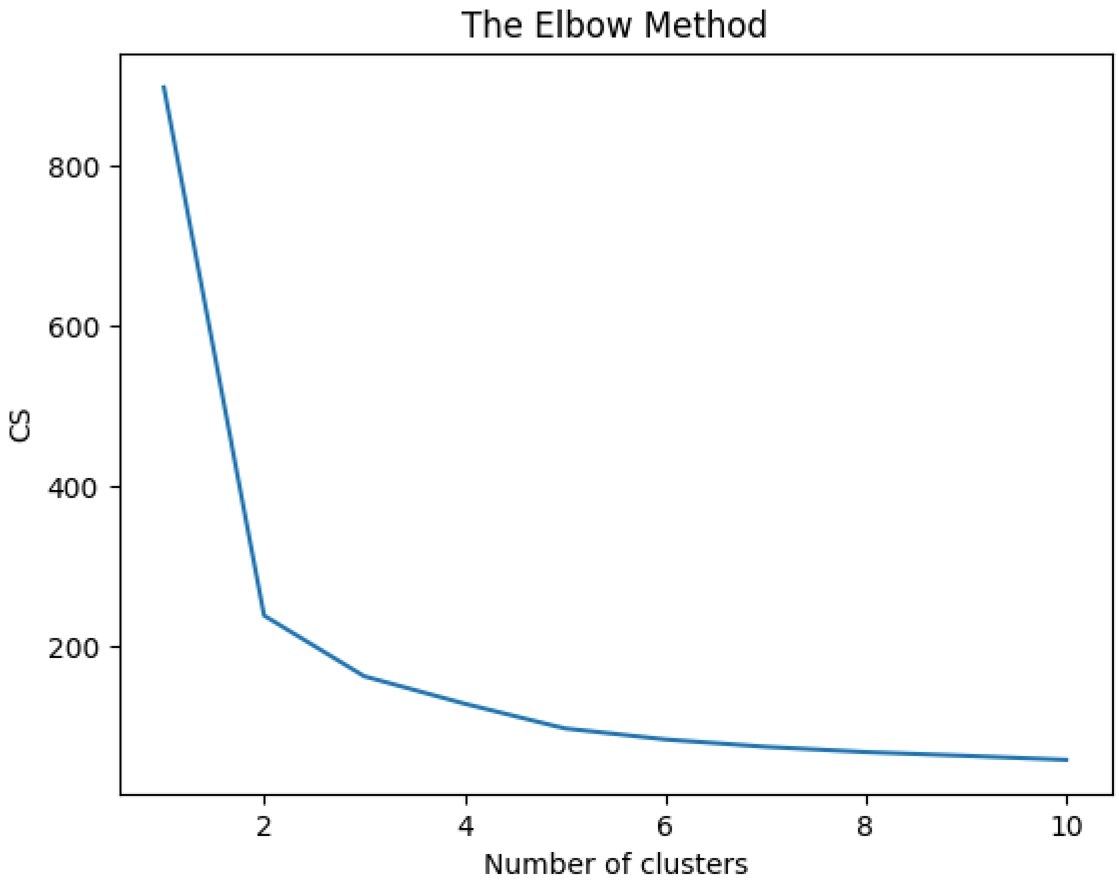
In [ ]:

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

```
Accuracy score: 0.61
```

In [ ]:

```python
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, r
    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()
```



In [ ]:

```python
from sklearn.cluster import KMeans

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

kmeans.fit(X)
y_kmeans = kmeans.predict(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)))
```

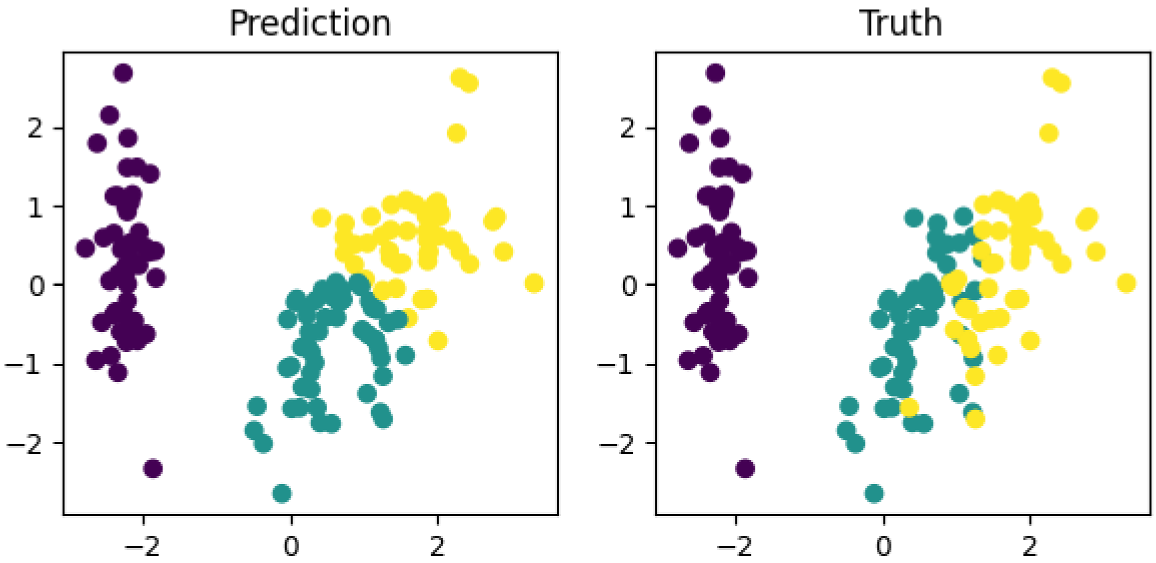
```
Result: 4288 out of 7050 samples were correctly labeled.
Accuracy score: 0.61
```

In [ ]:

```python
# plot clusters for observations and predictions
fig, ax = plt.subplots(1, 2, figsize=(7, 3))
ax[0].scatter(X_pca['PC1'], X_pca['PC2'], c=changedPredictions)
ax[1].scatter(X_pca['PC1'], X_pca['PC2'], c=labels)
ax[0].set_title('Prediction')
ax[1].set_title('Truth')
```

Out[ ]:

```
Text(0.5, 1.0, 'Truth')
```


Prediction
Truth
2
1
0
−1
−2
−2
0
2