

```
In [56]: import pandas as pd  
import matplotlib.pyplot as plt
```

```
In [57]: import openpyxl  
xls=pd.ExcelFile('/home/placement/Downloads/countrys.xlsx',engine='openpyxl')  
data=pd.read_excel(xls)
```

```
In [58]: data.describe()
```

Out[58]:

	lat	long
count	7.000000	7.000000
mean	30.812857	33.337143
std	31.908058	32.230456
min	-26.830000	4.670000
25%	14.830000	11.880000
50%	47.080000	18.300000
75%	50.890000	53.000000
max	64.000000	80.630000

```
In [59]: X=data.drop(['country','languages'],axis=1)
```

In [60]: X

Out[60]:

	lat	long
0	47.08	13.33
1	50.63	4.67
2	51.15	10.43
3	64.00	18.30
4	22.00	78.00
5	7.66	80.63
6	-26.83	28.00

```
In [61]: from sklearn.cluster import KMeans
Kmeans=KMeans(n_clusters=2)
ypred=Kmeans.fit_predict(X)
ypred=Kmeans.predict(X)
```

/home/placement/anaconda3/lib/python3.10/site-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning
warnings.warn(

In [62]: ypred

Out[62]: array([0, 0, 0, 0, 1, 1, 1], dtype=int32)

```
In [63]: data['category']=ypred
```

In [64]: data

Out[64]:

	country	lat	long	languages	category
0	austria	47.08	13.33	english	0
1	belijum	50.63	4.67	english	0
2	germany	51.15	10.43	german	0
3	norway	64.00	18.30	english	0
4	india	22.00	78.00	hindi	1
5	srilanka	7.66	80.63	srinhala	1
6	southafrica	-26.83	28.00	english	1

```
In [65]: from sklearn.cluster import KMeans
Kmeans=KMeans(n_clusters=3)
ypred=Kmeans.fit_predict(X)
ypred=Kmeans.predict(X)
```

/home/placement/anaconda3/lib/python3.10/site-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning
warnings.warn(

In [66]: ypred

Out[66]: array([0, 0, 0, 0, 1, 1, 2], dtype=int32)

```
In [67]: data['category']=ypred
```

In [68]: data

Out[68]:

	country	lat	long	languages	category
0	austria	47.08	13.33	english	0
1	belijum	50.63	4.67	english	0
2	germany	51.15	10.43	german	0
3	norway	64.00	18.30	english	0
4	india	22.00	78.00	hindi	1
5	srilanka	7.66	80.63	srinhala	1
6	southafrica	-26.83	28.00	english	2

In []: