

```
In [14]: import pandas as pd
import matplotlib.pyplot as plt
```

```
In [27]: import warnings
warnings.filterwarnings("ignore")
```

reading excel

```
In [28]: import openpyxl
data=pd.read_excel('/home/placement/Downloads/continents1.xlsx',engine='openpyxl')
```

```
In [29]: data
```

```
Out[29]:
```

	country	lat	lon	language
0	Austria	47.68	13.33	English
1	India	22.00	78.00	hindi
2	Bejium	50.83	4.67	english
3	germany	51.15	10.43	german
4	norway	64.00	18.30	english
5	sri lanka	7.66	80.63	simhalase

```
In [30]: data.head(10)
```

```
Out[30]:
```

	country	lat	lon	language
0	Austria	47.68	13.33	English
1	India	22.00	78.00	hindi
2	Bejium	50.83	4.67	english
3	germany	51.15	10.43	german
4	norway	64.00	18.30	english
5	sri lanka	7.66	80.63	simhalase

```
In [31]: sai=data.drop(['language','country'],axis=1)
sai
```

```
Out[31]:
```

	lat	lon
0	47.68	13.33
1	22.00	78.00
2	50.83	4.67
3	51.15	10.43
4	64.00	18.30
5	7.66	80.63

```
In [32]: x=sai
x
```

```
Out[32]:
```

	lat	lon
0	47.68	13.33
1	22.00	78.00
2	50.83	4.67
3	51.15	10.43
4	64.00	18.30
5	7.66	80.63

clusters 2

```
In [43]: from sklearn.cluster import KMeans
Kmeans=KMeans(n_clusters=2)
ypred=Kmeans.fit_predict(x)
ypred=Kmeans.predict(x)
```

```
In [44]: ypred
```

```
Out[44]: array([1, 0, 1, 1, 1, 0], dtype=int32)
```

```
In [45]: data['category']=ypred
data
```

Out[45]:

	country	lat	lon	language	category
0	Austria	47.68	13.33	English	1
1	India	22.00	78.00	hindi	0
2	Bejium	50.83	4.67	english	1
3	germany	51.15	10.43	german	1
4	norway	64.00	18.30	english	1
5	sri lanka	7.66	80.63	simhalase	0

clusters 3

```
In [46]: from sklearn.cluster import KMeans
Kmeans=KMeans(n_clusters=3)
ypred=Kmeans.fit_predict(x)
ypred=Kmeans.predict(x)
```

```
In [47]: ypred
```

Out[47]: array([2, 1, 2, 2, 0, 1], dtype=int32)

```
In [48]: data['category']=ypred
datadata['category']=ypred
data
```

Out[48]:

	country	lat	lon	language	category
0	Austria	47.68	13.33	English	2
1	India	22.00	78.00	hindi	1
2	Bejium	50.83	4.67	english	2
3	germany	51.15	10.43	german	2
4	norway	64.00	18.30	english	0
5	sri lanka	7.66	80.63	simhalase	1

In []: