Cluster data into predifined number of groups.

Unsupervised learning as there is no training or testing

No labels are already present in the data

In [1]:

```python
import pandas as pd

df=pd.read_csv('clusterdata.csv')
df
```

Out[1]:

	Unnamed: 0	Name	Fare	Age
0	0	Braund, Mr. Owen Harris	7.2500	22.0
1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	71.2833	38.0
2	2	Heikkinen, Miss. Laina	7.9250	26.0
3	3	Futrelle, Mrs. Jacques Heath (Lily May Peel)	53.1000	35.0
4	4	Allen, Mr. William Henry	8.0500	35.0
...	...	...	...	...
886	886	Montvila, Rev. Juozas	13.0000	27.0
887	887	Graham, Miss. Margaret Edith	30.0000	19.0
888	888	Johnston, Miss. Catherine Helen "Carrie"	23.4500	NaN
889	889	Behr, Mr. Karl Howell	30.0000	26.0
890	890	Dooley, Mr. Patrick	7.7500	32.0

891 rows × 4 columns

In [2]:

```python
df.drop('Unnamed: 0',axis=1,inplace=True)
df
```

Out[2]:

	Name	Fare	Age
0	Braund, Mr. Owen Harris	7.2500	22.0
1	Cumings, Mrs. John Bradley (Florence Briggs Th...	71.2833	38.0
2	Heikkinen, Miss. Laina	7.9250	26.0
3	Futrelle, Mrs. Jacques Heath (Lily May Peel)	53.1000	35.0
4	Allen, Mr. William Henry	8.0500	35.0
...	...	...	...
886	Montvila, Rev. Juozas	13.0000	27.0
887	Graham, Miss. Margaret Edith	30.0000	19.0
888	Johnston, Miss. Catherine Helen "Carrie"	23.4500	NaN
889	Behr, Mr. Karl Howell	30.0000	26.0
890	Dooley, Mr. Patrick	7.7500	32.0

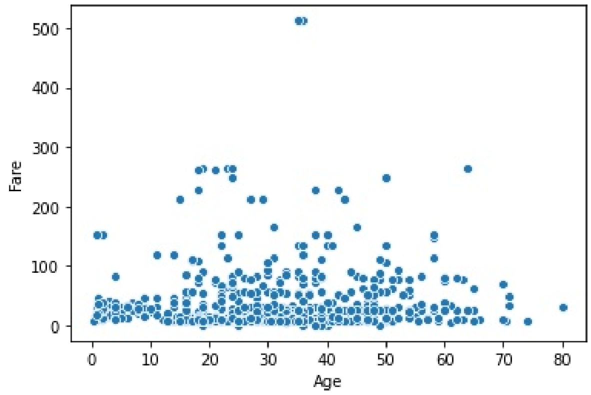
891 rows × 3 columns

In [3]:

```
import seaborn as sns
sns.scatterplot(y='Fare',x='Age',data=df)
```

Out[3]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f0ea4e5a760>
```



In [4]:

```
df.dropna(axis=0,how='any',inplace=True)
```

In [5]:

```
"""

NO TRAINING, TESTING SPLIT REQUIRED
"""
```

Out[5]:

```
'\n\nNO TRAINING, TESTING SPLIT REQUIRED\n'
```

In [6]:

```
from sklearn.cluster import KMeans

model=KMeans(n_clusters=3) #Form 3 clusters
```

In [7]:

```
arr=model.fit_transform(df[['Fare','Age']]) #Do the fitting of the data
#Data is put in cluster with which distance of a given point to its centre is minimum
pd.DataFrame(arr) #shows distance of a data point(1 row) with all cluster centroids(columns).
```

Out[7]:

	0	1	2
0	11.079502	278.282500	79.253156
1	55.799059	214.207205	14.142925
2	8.723362	277.504585	77.979875
3	37.371360	232.313112	32.184878
4	10.609793	277.357975	77.227273
...	...	...	...
709	16.647113	256.376181	56.231475
710	3.590362	272.413351	72.819737
711	16.571583	255.671136	57.802486
712	13.878197	255.433742	56.154283
713	9.315058	277.632734	77.620686

714 rows × 3 columns

In [8]:

```
arr=model.fit_predict(df[['Fare','Age']]) #We can directly obtain the cluster of a data point
pd.DataFrame(arr)
```

Out[8]:

	0
0	0
1	2
2	0
3	2
4	0
...	...
709	0
710	0
711	0
712	0
713	0

714 rows × 1 columns

In [9]:

```
df['Predicted Cluster']=arr #add the column to the cluster
df
```

Out[9]:

	Name	Fare	Age	Predicted Cluster
0	Braund, Mr. Owen Harris	7.2500	22.0	0
1	Cumings, Mrs. John Bradley (Florence Briggs Th...	71.2833	38.0	2
2	Heikkinen, Miss. Laina	7.9250	26.0	0
3	Futrelle, Mrs. Jacques Heath (Lily May Peel)	53.1000	35.0	2
4	Allen, Mr. William Henry	8.0500	35.0	0
...	...	...	...	...
885	Rice, Mrs. William (Margaret Norton)	29.1250	39.0	0
886	Montvila, Rev. Juozas	13.0000	27.0	0
887	Graham, Miss. Margaret Edith	30.0000	19.0	0
889	Behr, Mr. Karl Howell	30.0000	26.0	0
890	Dooley, Mr. Patrick	7.7500	32.0	0

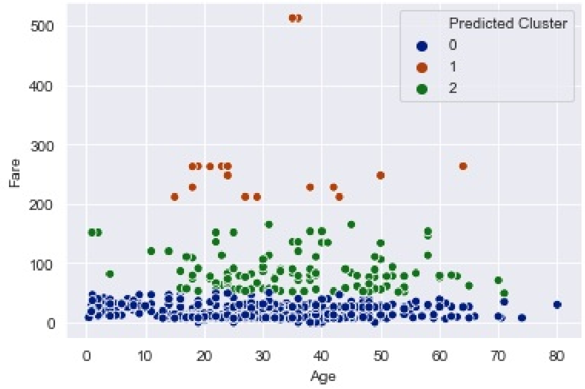
714 rows × 4 columns

In [10]:

```
#Plot and see the graph of cluster points hued by the cluster number
sns.set_style('darkgrid')
sns.scatterplot(y='Fare',x='Age',hue='Predicted Cluster',data=df,palette='dark')
```

Out[10]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f0e9c7fe130>
```



In [11]:

```
import numpy as np
model.fit_predict(np.array([[100],[231],[50]]))
```

Out[11]:

```
array([0, 1, 2], dtype=int32)
```