In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [19]:
```
kpop = pd.read_csv('kpop_idol_followers.csv')
```

In [20]:
```
kpop.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 406 entries, 0 to 405
Data columns (total 21 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   Stage.Name      406 non-null    object 
 1   Group           406 non-null    object 
 2   ig_name         406 non-null    object 
 3   Followers       406 non-null    int64  
 4   Gender.x        406 non-null    object 
 5   Full.Name       406 non-null    object 
 6   Korean.Name     406 non-null    object 
 7   K.Stage.Name    406 non-null    object 
 8   Date.of.Birth   406 non-null    object 
 9   Debut           406 non-null    object 
 10  Company         406 non-null    object 
 11  Country         406 non-null    object 
 12  Second.Country  15 non-null     object 
 13  Height          248 non-null    float64
 14  Weight          175 non-null    float64
 15  Birthplace      288 non-null    object 
 16  Other.Group     79 non-null     object 
 17  Former.Group    35 non-null     object 
 18  Gender.y        406 non-null    object 
 19  age             406 non-null    int64  
 20  year.career     406 non-null    int64  
dtypes: float64(2), int64(3), object(16)
memory usage: 66.7+ KB
```

In [21]:
```
kpop.head()
```

Out[21]:

	Stage.Name	Group	ig_name	Followers	Gender.x	Full.Name	Korean.Name	K.Stage.Nam
0	Ace	VAV	ace.vav	335439	Boy	Jang Wooyoung	장우영	에이
1	Ahra	FAVORITE	ahra.view	12342	Girl	Go Ahra	고아라	아
2	Ahyoung	DAL SHABET	a_young91	10479	Girl	Cho Jayoung	조자영	아
3	Alice	HELLO VENUS	hv_alice	11135	Girl	Song Joohee	송주희	앨리
4	Amber	F(X)	ajol_llama	5519743	Girl	Amber Josephine Liu	엠버 조세핀 리우	엠

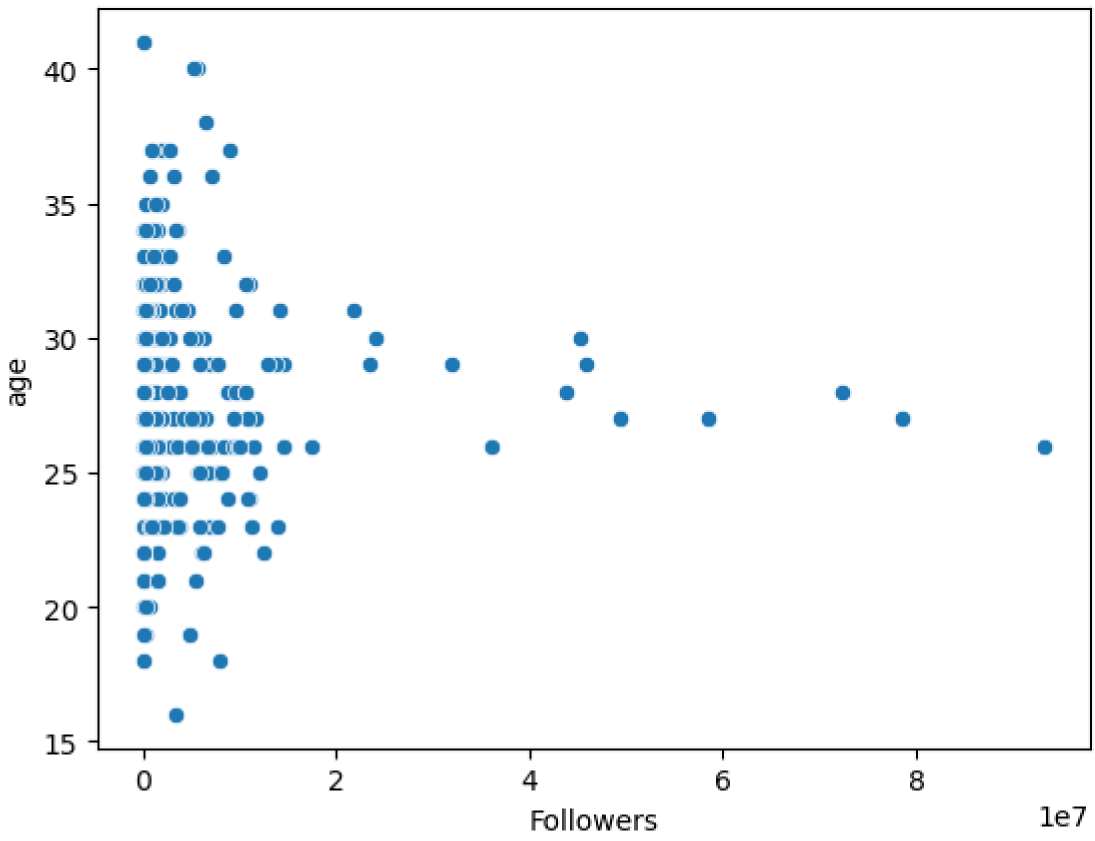
5 rows × 21 columns

In [22]:

```
sns.scatterplot(data = kpop,x = 'Followers',y = 'age')
```

Out[22]:

```
<Axes: xlabel='Followers', ylabel='age'>
```



In [29]:

```
kpop2 = kpop[ ['Followers','age'] ].dropna()
kpop2.head()
```

Out[29]:

	Followers	age
0	335439	30
1	12342	22
2	10479	32
3	11135	33
4	5519743	30

In [30]:

```
from sklearn.cluster import KMeans
```

In [35]:

```
model = KMeans(n_clusters=4,random_state = 0)
model.fit(kpop2)
```

```
C:\Users\natty\anaconda3\Lib\site-packages\sklearn\cluster\_kmeans.py:1412: Future
Warning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set t
he value of `n_init` explicitly to suppress the warning
  super()._check_params_vs_input(X, default_n_init=10)
C:\Users\natty\anaconda3\Lib\site-packages\sklearn\cluster\_kmeans.py:1436: UserWa
rning: KMeans is known to have a memory leak on Windows with MKL, when there are l
ess chunks than available threads. You can avoid it by setting the environment var
iable OMP_NUM_THREADS=2.
  warnings.warn(
```

Out[35]:

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

In [36]:

```
model.cluster_centers_
```

Out[36]:

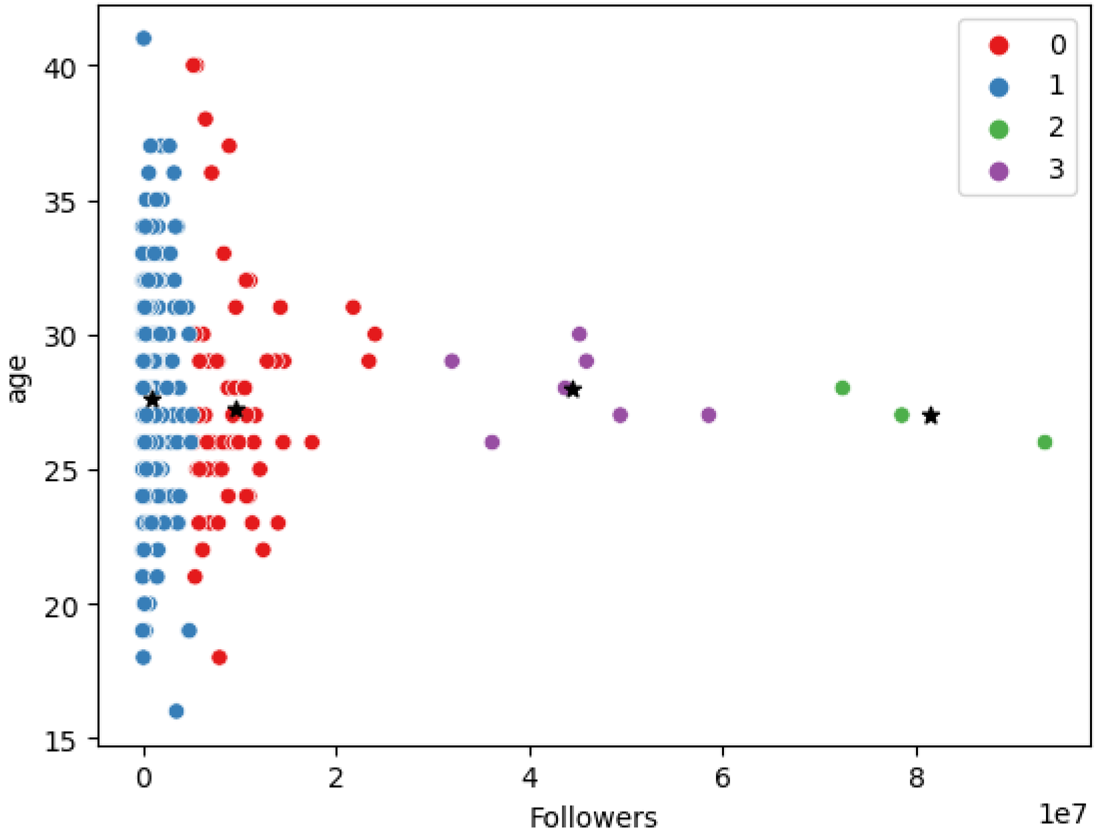
```
array([[9.57900090e+06, 2.72537313e+01],
       [8.52328295e+05, 2.76170213e+01],
       [8.14206577e+07, 2.70000000e+01],
       [4.44068214e+07, 2.80000000e+01]])
```

In [37]:

```
sns.scatterplot(data = kpop,x = 'Followers',y = 'age',hue = model.labels_,palette =
plt.scatter(model.cluster_centers_[:,0],model.cluster_centers_[:,1],color = 'k',mar
```

Out[37]:

```
<matplotlib.collections.PathCollection at 0x28b7d3c5c50>
```



In [ ]: