In [1]:
```
import pandas as pd
```

In [2]:
```
 dataframe=pd.read_csv("shop.csv")
```

In [3]:
```
dataframe.head()
```

Out[3]:

	CustomerID	Genre	Age	Annual Income (k$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

In [4]:
```
from sklearn.preprocessing import LabelEncoder
```

In [5]:
```
lb=LabelEncoder()
```

In [6]:
```
dataframe['Genre']=lb.fit_transform(dataframe['Genre'])
```

In [7]:
```
 dataframe.head()
```

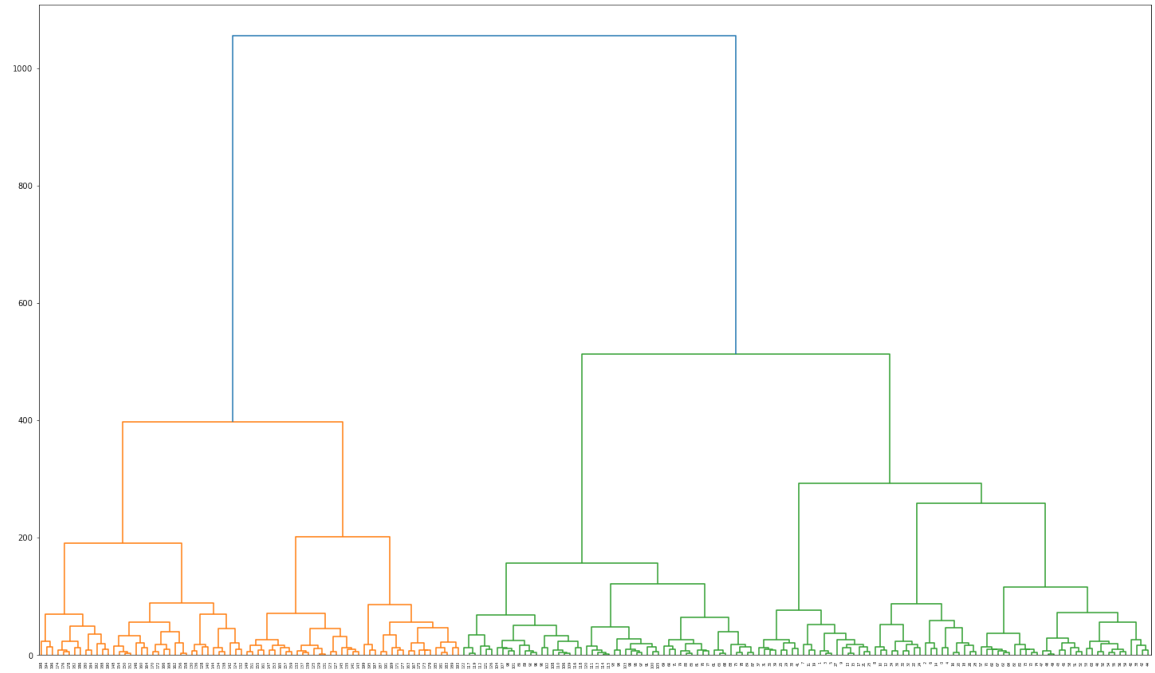
Out[7]:

	CustomerID	Genre	Age	Annual Income (k$)	Spending Score (1-100)
0	1	1	19	15	39
1	2	1	21	15	81
2	3	0	20	16	6
3	4	0	23	16	77
4	5	0	31	17	40

In [8]:
```
import matplotlib.pyplot as plt
```

In [9]:
```
import scipy.cluster.hierarchy as shc
```

In [11]:
```
plt.figure(figsize=(25,15))
dendogram1=shc.dendrogram(shc.linkage(dataframe,method='ward'))
```



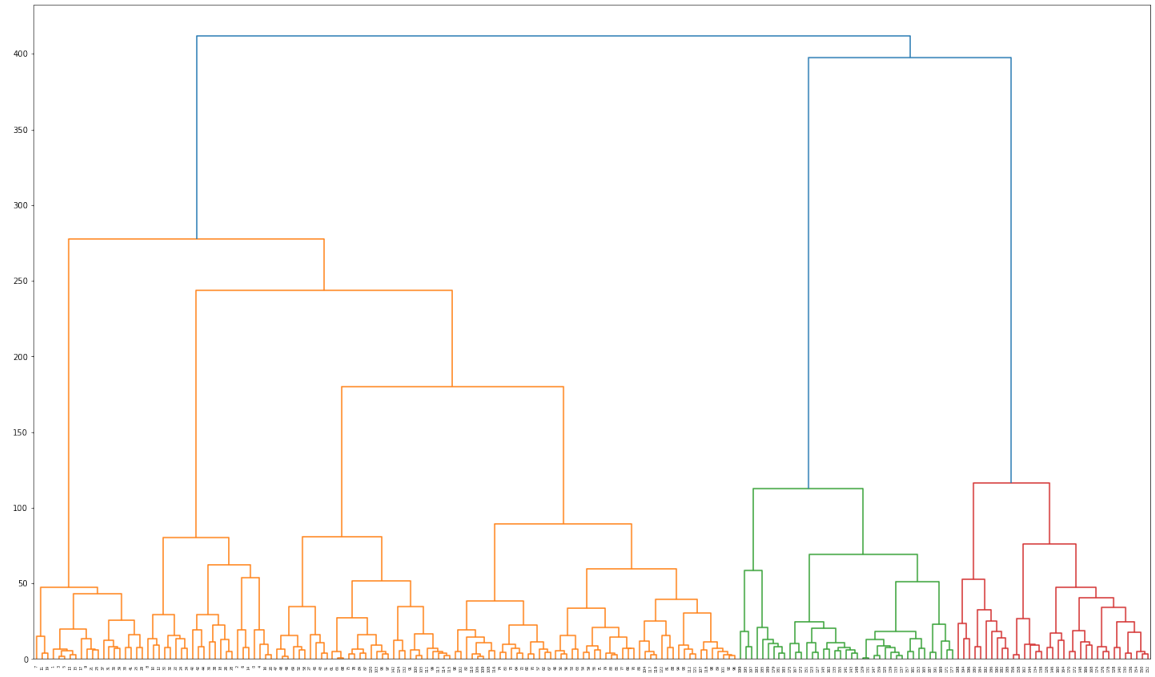
In [12]:
```
data=dataframe.iloc[:,2:5]
```

In [13]:
```
data.head()
```

Out[13]:

	Age	Annual Income (k$)	Spending Score (1-100)
0	19	15	39
1	21	15	81
2	20	16	6
3	23	16	77
4	31	17	40

In [15]:
```
plt.figure(figsize=(25,15))
dendogram2=shc.dendrogram(shc.linkage(data,method='ward'))
```



In [16]:
```
from sklearn.cluster import AgglomerativeClustering
```

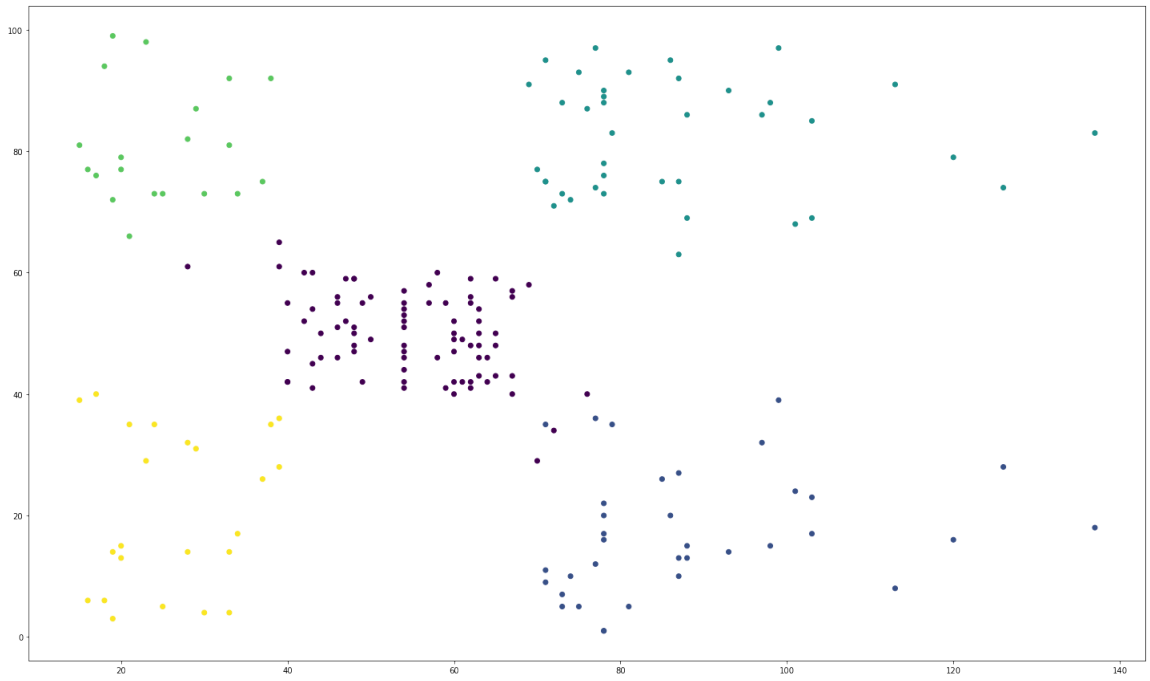
In [17]:
```
model = AgglomerativeClustering(n_clusters=5)
```

In [18]:
```
model.fit_predict(data)
```

Out[18]:
```
array([4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3,
       4, 3, 4, 3, 4, 0, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 0,
       4, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 0, 2, 1, 2, 1, 2, 1, 2,
       0, 2, 1, 2, 1, 2, 1, 2, 1, 2, 0, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2,
       1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2,
       1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2,
       1, 2], dtype=int64)
```

In [22]:
```
1 plt.figure(figsize=(25,15))
2 plt.scatter(data['Annual Income (k$)'],data['Spending Score (1-100)'],c
3
```

Out[22]: <matplotlib.collections.PathCollection at 0x2115e8c6be0>



In [ ]:
```
1
```