In [3]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.cluster import AgglomerativeClustering
```

In [4]:
```
df=pd.read_csv("Iris.csv")
df.head()
```

Out[4]:

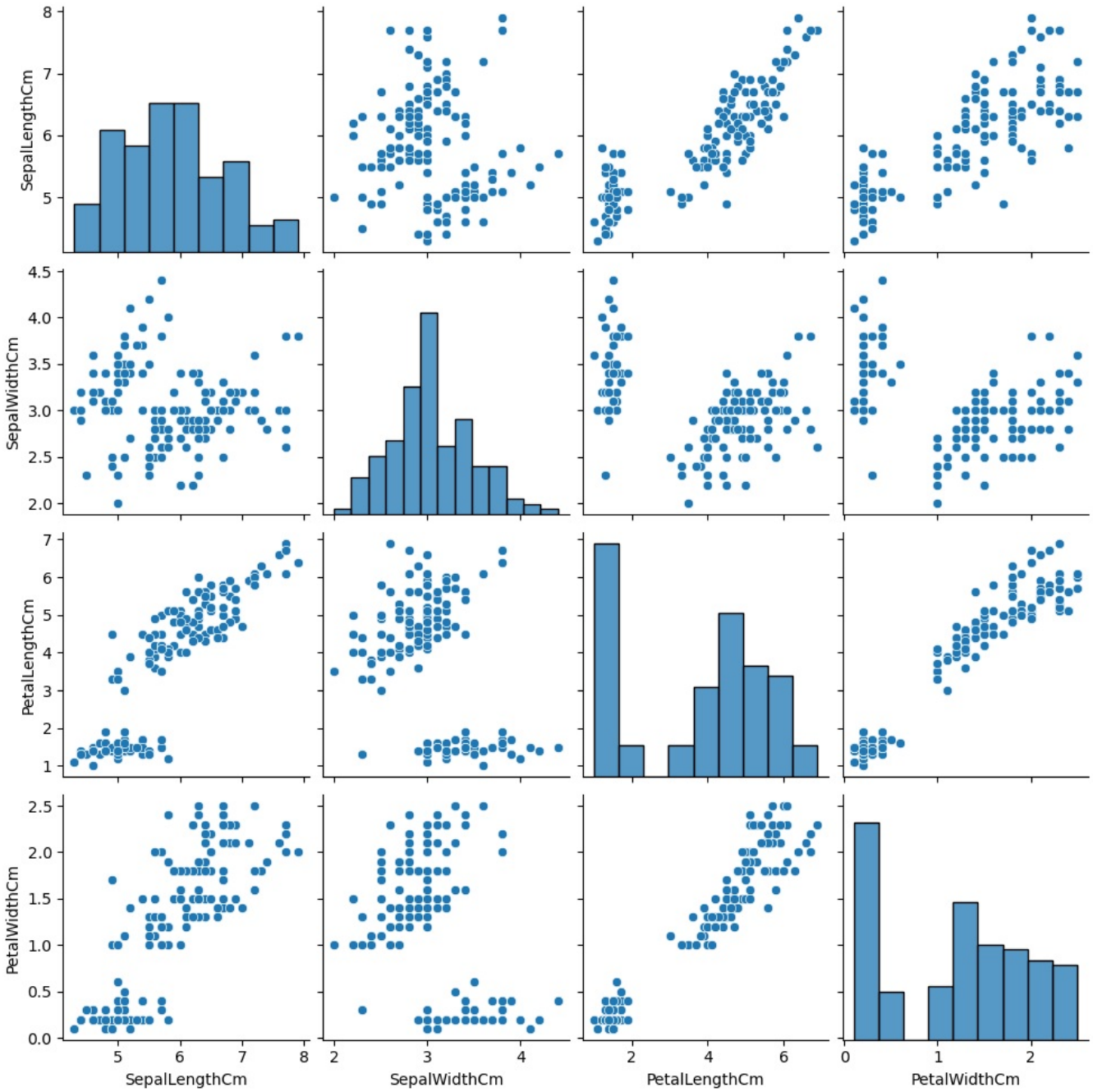
	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2

In [5]:
```
df.isnull().sum()
```

Out[5]:
```
SepalLengthCm    0
SepalWidthCm     0
PetalLengthCm    0
PetalWidthCm     0
dtype: int64
```

In [19]:
```
sns.pairplot(data=df)
plt.show()
```

```
C:\ProgramData\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed
to tight
  self._figure.tight_layout(*args, **kwargs)
```

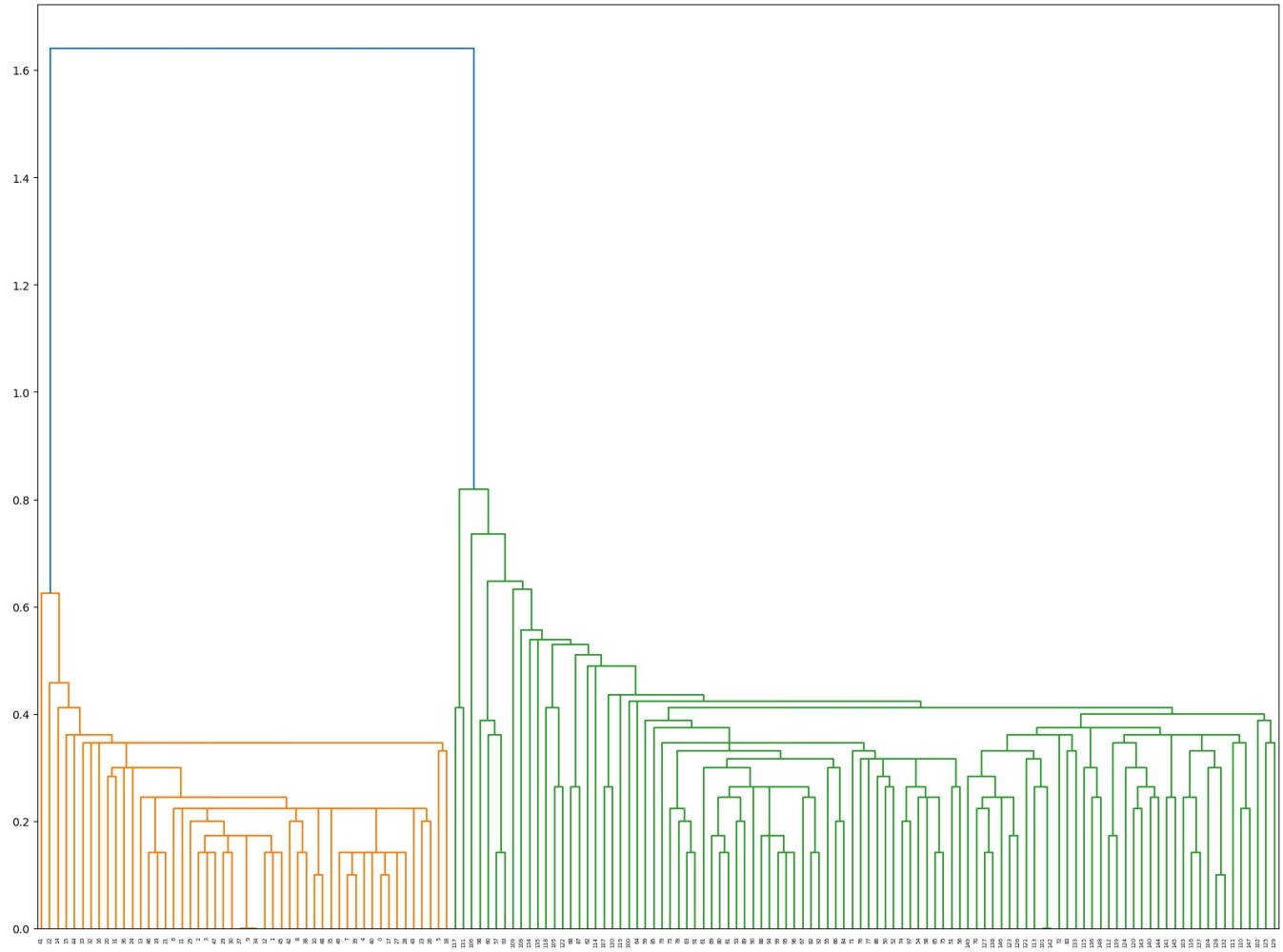


In [6]:
```
! pip install scipy
```

```
Requirement already satisfied: scipy in c:\programdata\anaconda3\lib\site-packages (1.11.1)
Requirement already satisfied: numpy<1.28.0,>=1.21.6 in c:\programdata\anaconda3\lib\site-packages (from scipy)
(1.24.3)
```

In [8]:
```
import scipy.cluster.hierarchy as sp
```

In [18]:
```
plt.figure(figsize=(20,15))
sp.dendrogram(sp.linkage(df, method='single', metric='euclidean'))
plt.show()
```



In [38]:
```
agc=AgglomerativeClustering(n_clusters=2,linkage="single")
df["predict"]=agc.fit_predict(df)
```

In [39]:
```
df
```

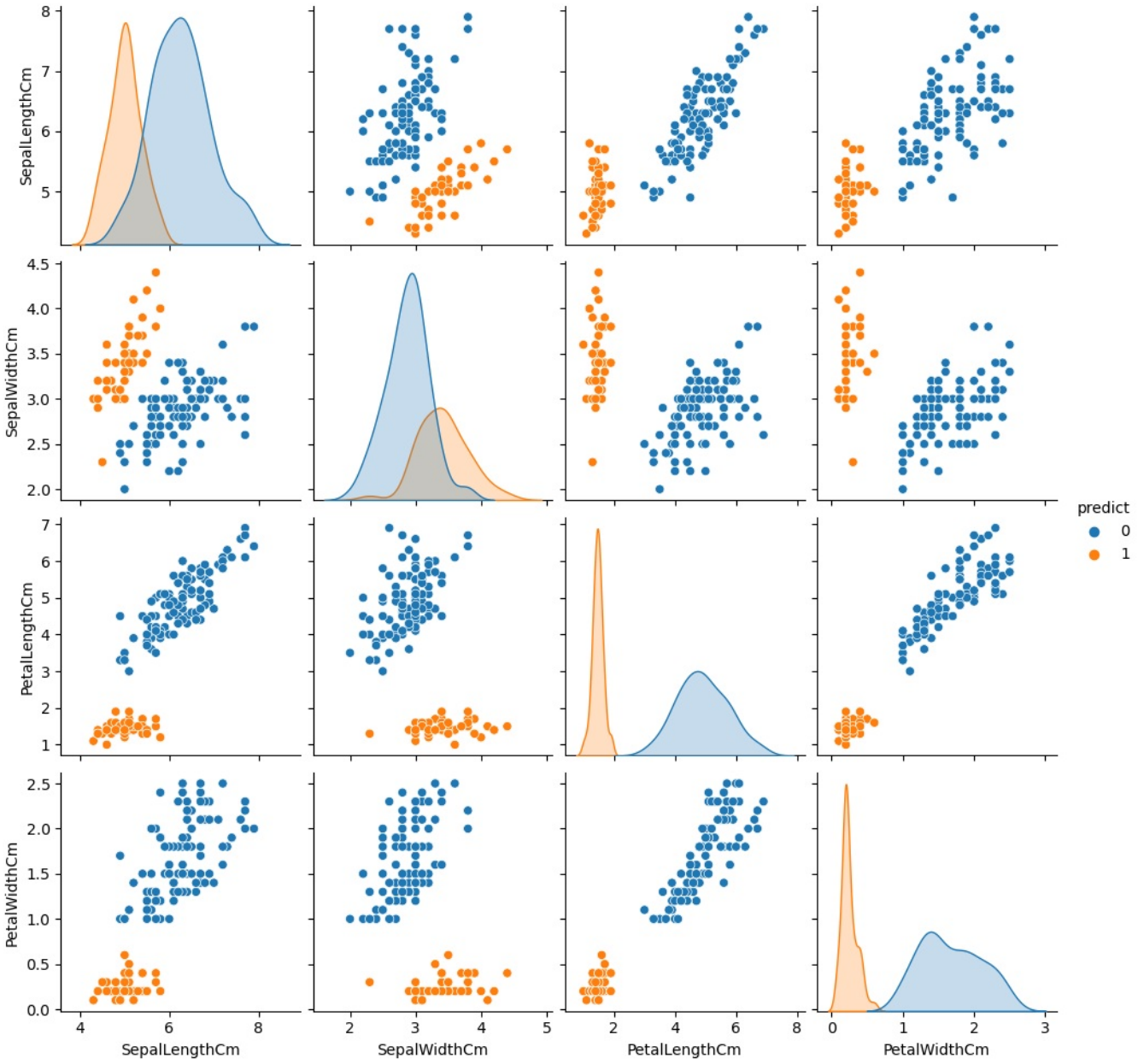
Out[39]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	predict
0	5.1	3.5	1.4	0.2	1
1	4.9	3.0	1.4	0.2	1
2	4.7	3.2	1.3	0.2	1
3	4.6	3.1	1.5	0.2	1
4	5.0	3.6	1.4	0.2	1
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	0
146	6.3	2.5	5.0	1.9	0
147	6.5	3.0	5.2	2.0	0
148	6.2	3.4	5.4	2.3	0
149	5.9	3.0	5.1	1.8	0

150 rows × 5 columns

In [40]:
```
sns.pairplot(df,hue="predict")
plt.show()
```

```
C:\ProgramData\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed
to tight
  self._figure.tight_layout(*args, **kwargs)
```



In [ ]:

In [ ]: