```python
# Title : Agglomerative Clustering

import pandas as pd

data = [[200,500],
        [700,750],
        [250,450],
        [300,550],
        [600,300],
        [500,350],
        [700,850],
        [650,700],
        [900,700],
        [400,200]]


df = pd.DataFrame(data, columns=["A","B"])

print(df)
```

```
       A    B
0    200  500
1    700  750
2    250  450
3    300  550
4    600  300
5    500  350
6    700  850
7    650  700
8    900  700
9    400  200
```

```python
import scipy.cluster.hierarchy as sch
dendrogram = sch.dendrogram(sch.linkage(df, method="average"))
```



```python
from sklearn.cluster import AgglomerativeClustering


agg_model = AgglomerativeClustering(n_clusters=3, affinity="euclidean", linkage="average")
agg_model.fit(df)
```

```
AgglomerativeClustering(affinity='euclidean', compute_full_tree='auto',
                        connectivity=None, distance_threshold=None,
                        linkage='average', memory=None, n_clusters=3)
```

```python
cluster_label = agg_model.labels_
print(cluster_label)
```

```
[2 0 2 2 1 1 0 0 0 1]
```

```python
# inserting the labels column in the original DataFrame
df.insert(2, "Label", cluster_label, True)


# plotting the data
import seaborn as sns
sns.lmplot(data=df, x="A", y="B", hue="Label", fit_reg=False, legend=True, legend_out=True)
```