



Department of Computer Science and Engineering Data Science

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Class / Branch: DS

Subject: DWM

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Experiment No. 8

Aim:- Implementation of Agglomerative hierarchical clustering algorithm using python.

Input:-

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.cluster import AgglomerativeClustering
from scipy.cluster.hierarchy import dendrogram, linkage

# Sample x and y coordinate data
X = np.array([[1, 2], [2, 3], [3, 6], [8, 7], [8, 8], [12, 30]])

# Perform Agglomerative Clustering with single linkage on the coordinates
agg_clustering = AgglomerativeClustering(n_clusters=1, linkage='single')
labels = agg_clustering.fit_predict(X)

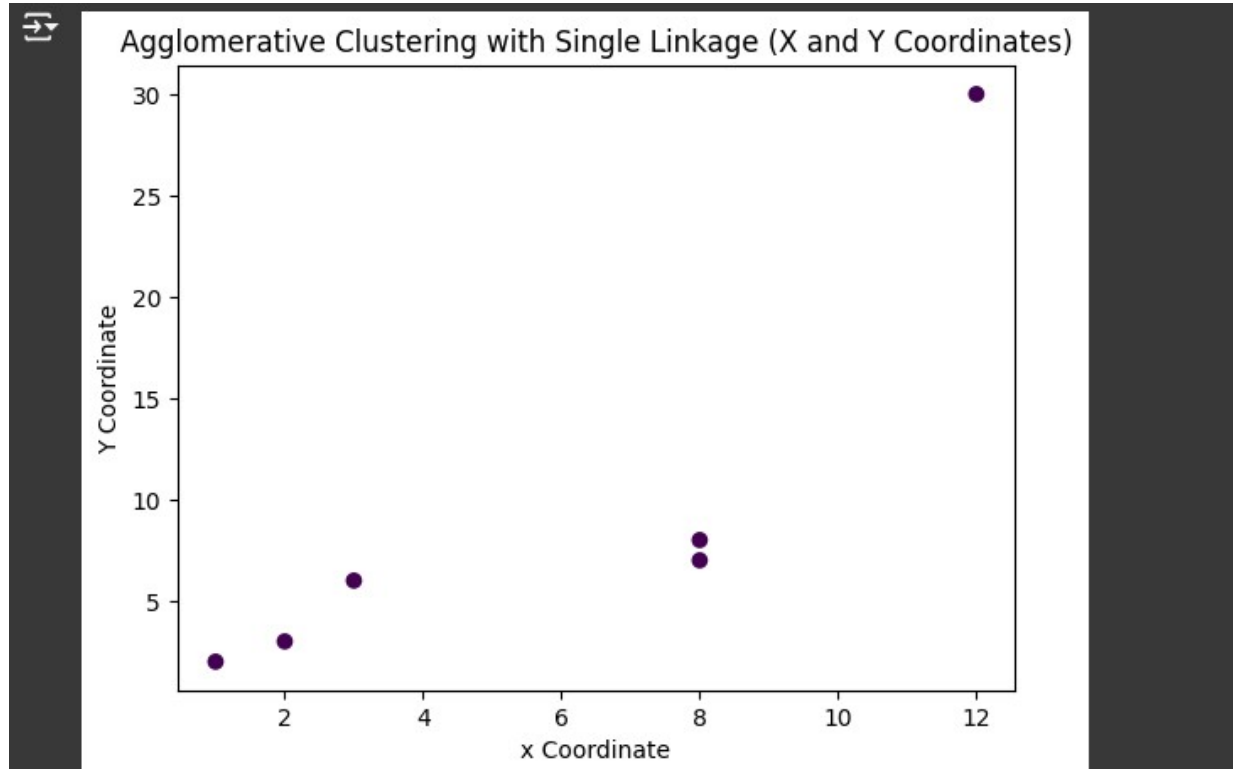
# Plot the clusters
plt.scatter(X[:, 0], X[:, 1], c=labels, cmap='viridis')
plt.title('Agglomerative Clustering with Single Linkage (X and Y Coordinates)')
plt.xlabel('x Coordinate')
plt.ylabel('Y Coordinate')
plt.show()

# Generate dendrogram for single linkage
linked = linkage(X, method='single')
plt.figure(figsize=(10, 7))
```



```
dendrogram (linked)  
plt.title('Dendrogram (Single Linkage)')  
plt.xlabel('Data Point Index')  
plt.ylabel('Distance')  
plt.show()
```

Output:-





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