

```

1 import pandas as pd
2 import numpy as np
3 import matplotlib.pyplot as plt
4 %matplotlib inline

1 data = pd.read_csv('Wholesale customers data.csv')
2 data.head()

```

	Channel	Region	Fresh	Milk	Grocery	Frozen	Detergents_Paper	Delicassen	
0	2	3	12669	9656	7561	214	2674	1338	
1	2	3	7057	9810	9568	1762	3293	1776	
2	2	3	6353	8808	7684	2405	3516	7844	
3	1	3	13265	1196	4221	6404	507	1788	
4	2	3	22615	5410	7198	3915	1777	5185	

Next steps: [View recommended plots](#)

```

1 from sklearn.preprocessing import normalize
2 data_scaled = normalize(data)
3 data_scaled = pd.DataFrame(data_scaled, columns=data.columns)
4 data_scaled.head()

```

	Channel	Region	Fresh	Milk	Grocery	Frozen	Detergents_Paper	Delicassen
0	0.000112	0.000168	0.708333	0.539874	0.422741	0.011965	0.149505	0.074
1	0.000125	0.000188	0.442198	0.614704	0.599540	0.110409	0.206342	0.111
2	0.000125	0.000187	0.396552	0.549792	0.479632	0.150119	0.219467	0.489
3	0.000065	0.000194	0.856837	0.077254	0.272650	0.413659	0.032749	0.115
4	0.000079	0.000119	0.895416	0.214203	0.284997	0.155010	0.070358	0.205

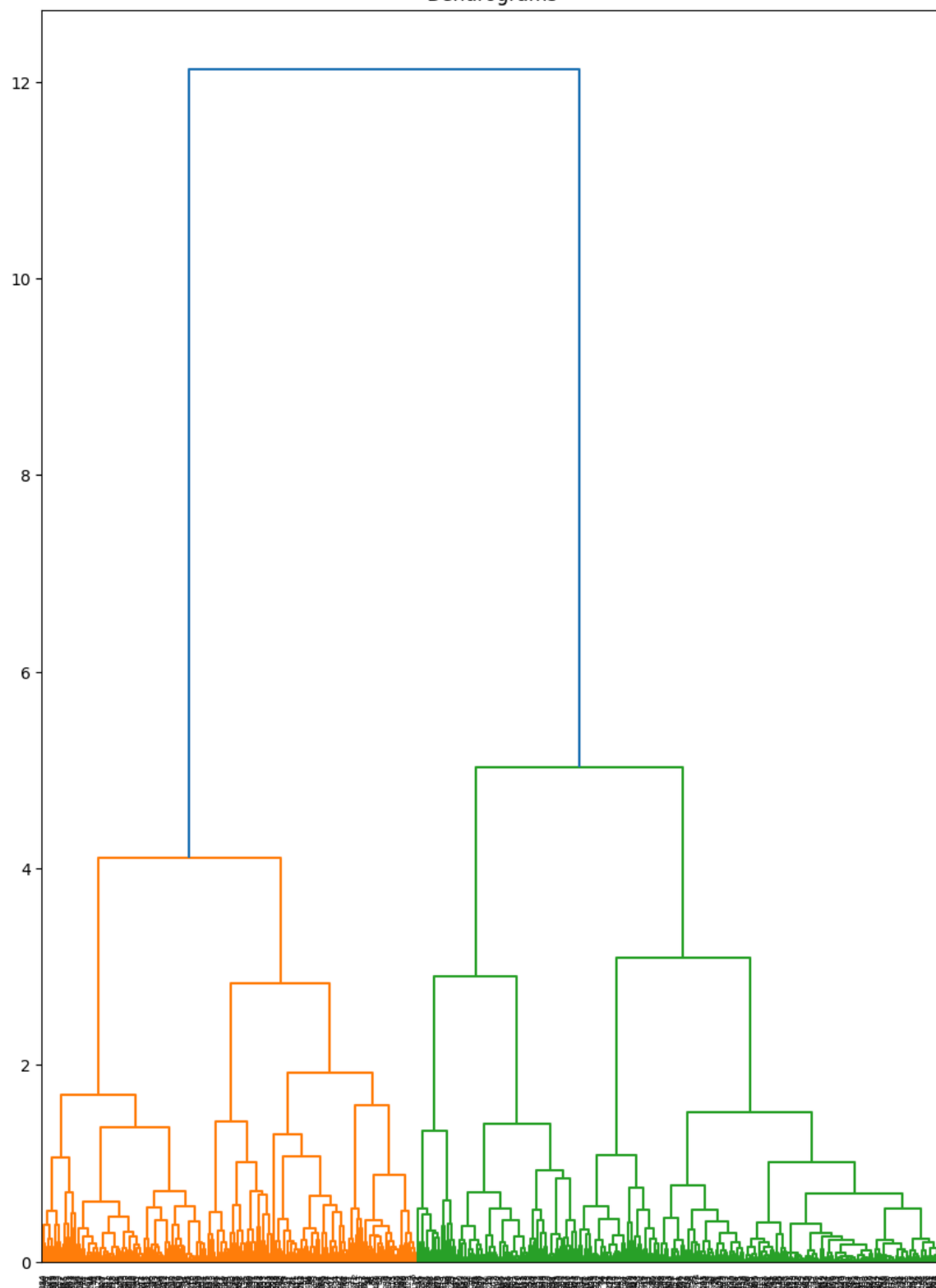
Next steps: [View recommended plots](#)

```

1 import scipy.cluster.hierarchy as shc
2 plt.figure(figsize=(10, 14))
3 plt.title("Dendrograms")
4 dend = shc.dendrogram(shc.linkage(data_scaled, method='ward'))

```

Dendrograms

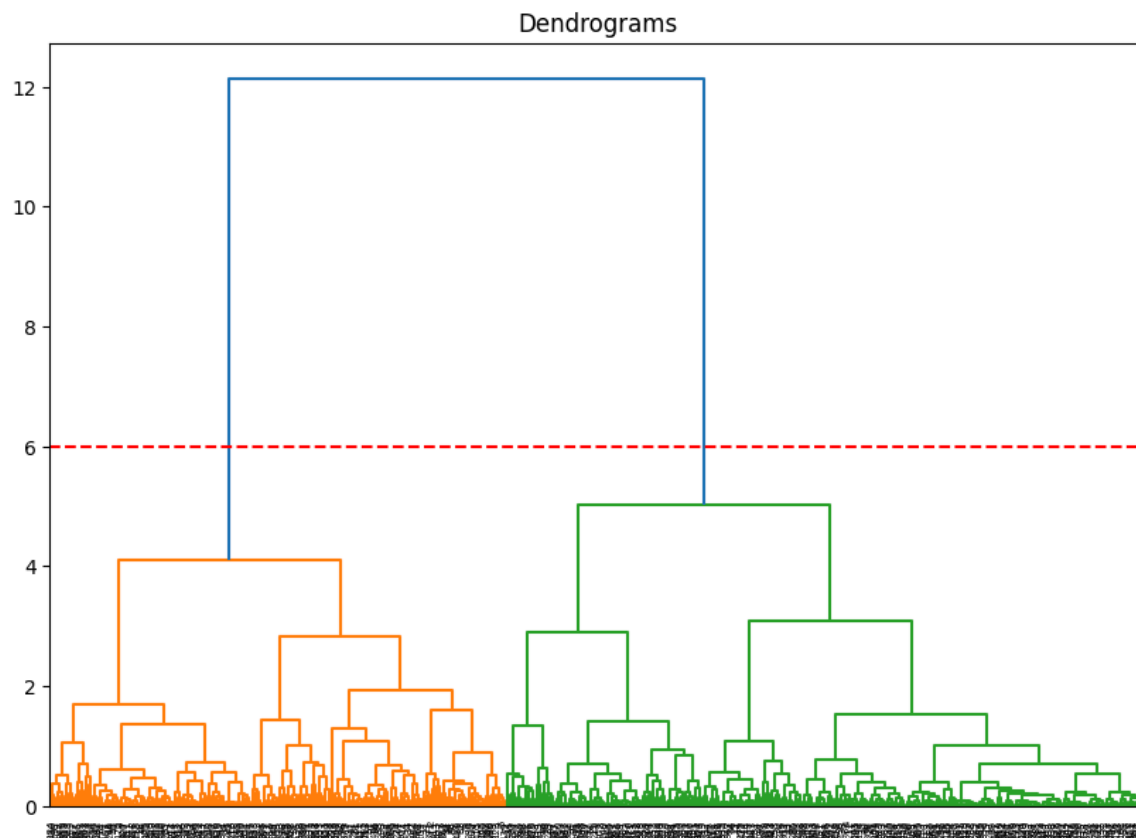


```

1 plt.figure(figsize=(10, 7))
2 plt.title("Dendrograms")
3 dend = shc.dendrogram(shc.linkage(data_scaled, method='ward'))
4 plt.axhline(y=6, color='r', linestyle='--')

```

<matplotlib.lines.Line2D at 0x7b76139800a0>



```

1 from sklearn.cluster import AgglomerativeClustering
2 cluster = AgglomerativeClustering(n_clusters=2, affinity='euclidean', linkage='ward')
3 cluster.fit_predict(data_scaled)

```

/usr/local/lib/python3.10/dist-packages/sklearn/cluster/\_agglomerative.py:983: FutureWarning: ,  
warnings.warn(  
array([1, 1, 1, 0, 0, 1, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0,

0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1,  
1, 1, 1, 1, 1, 1, 0, 1, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1, 1, 1, 0, 1,  
1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1, 1, 0, 0, 1, 1, 0,  
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1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 1, 1, 1,
1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 1])

```

```

1 plt.figure(figsize=(10, 7))
2 plt.scatter(data_scaled['Milk'], data_scaled['Grocery'], c=cluster.labels_)

```

<matplotlib.collections.PathCollection at 0x7b7615de1a50>

