



Figure 1: Hierarchical clustering dendrogram and heatmap visualization. The dendrogram on the left shows the hierarchical clustering of the rows. The heatmap on the right shows the data values for each row and column, color-coded according to the scale at the top.

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The dendrogram on the left side of the figure illustrates the hierarchical clustering of the rows. The root of the tree is at the top, and it branches downwards into two main clusters. The upper cluster is further divided into several sub-clusters, with the most prominent being a large group of rows that cluster together at the top. The lower cluster also branches into multiple sub-clusters, with a significant group of rows clustering together at the bottom. The overall structure of the dendrogram suggests a clear separation between the upper and lower groups of rows, with some internal clustering within each group.

The heatmap on the right side of the figure displays the data values for each row and column. The color scale at the top ranges from -8 (red) to 8 (green). The heatmap shows a complex pattern of red and green colors, indicating data values across a large number of rows and columns. The upper cluster of rows, as identified by the dendrogram, generally shows higher values (green) in the upper columns and lower values (red) in the lower columns. Conversely, the lower cluster of rows shows higher values (green) in the lower columns and lower values (red) in the upper columns. This pattern suggests a strong correlation between the row clusters and the column clusters, indicating a clear structure in the data.

The heatmap visualization provides a detailed view of the data values for each row and column. The color scale at the top indicates that values ranging from -8 to 8 are represented by a gradient from red to green. The heatmap shows a complex pattern of red and green colors, indicating data values across a large number of rows and columns. The upper cluster of rows, as identified by the dendrogram, generally shows higher values (green) in the upper columns and lower values (red) in the lower columns. Conversely, the lower cluster of rows shows higher values (green) in the lower columns and lower values (red) in the upper columns. This pattern suggests a strong correlation between the row clusters and the column clusters, indicating a clear structure in the data.