# Optimal Number of Clusters:

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Description automatically generated with medium confidence

The image shows two plots used to determine the optimal number of clusters (k) for clustering analysis: the Elbow Method plot and the Silhouette Score plot. Here, we are explaining about the elbow method.

### 1. Elbow Method (Left)

The Elbow Method helps to identify the optimal number of clusters by plotting the sum of squared distances (inertia) from each point to its assigned cluster centre.

* **X-axis**: Number of clusters (k).
* **Y-axis**: Inertia (sum of squared distances).

**Interpretation**:

* As the number of clusters increases, the inertia decreases because points are closer to their cluster centres.
* The "elbow point" is where the rate of decrease sharply slows down, indicating that adding more clusters beyond this point doesn't significantly reduce inertia.
* In this plot, the elbow point appears to be at k = 4, suggesting that 4 clusters might be optimal.

The Elbow Method suggests k = 4 as the point where adding more clusters results in diminishing returns.