1-Grouping unlabeled examples is called clustering. K-Means clustering , Mean Shift Clustering algorithm,Gaussian Mixture Model,DBSCAN,BIRCH Algorithm.

2 - **Market segmentation, Retail marketing and sales, Social network analysis, Image compression.**

**3 -** The Silhouette***method*** and ***Elbow method are used for selecting the best number of clusters***.

4 –

5-K-Means clustering and **CLARA** (clustering large applications).

DBSCAN .

6 - **An elementary school teacher presents a class problem to measure the length of the "Mayflower."** Rather than starting the problem by introducing the ruler, the teacher allows students to reflect and to construct their own methods of measurement.

7 -In "novelty detection", you have a data set that contains only good data, and you're trying to determine whether new observations fit within the existing data set. In "outlier detection", the data may contain outliers, which you want to identify.

8 - Gaussian mixture models (GMMs) are **a type of machine learning algorithm**. They are used to classify data into different categories based on the probability distribution. Gaussian mixture models can be used in many different areas, including finance, marketing and so much more.

## 9 - Silhouette score, Distance between GMMs, ****Bayesian information criterion****(BIC)