# Clustering vs Classification:

| Clustering | Classification |
|---|---|
| 1)It is an unsupervised learning technique. | 1)It is a supervised learning technique. |
| 2) Groups similar data-points together without prelabelled responses. | 2) predicts the category or class of new data points. |
| 3) As an output it produces clusters. | 3)Produces different output based on characteristics. |
| 4)Less complex when compared to classification. | 4)More Complex when compared to clustering. |
| **5)Algorithms:** Logistic regression, Naive Bayes classifier, Support vector machines. | 5)**Algorithms:** k-means clustering algorithm, Fuzzy c-means clustering algorithm, Gaussian (EM) clustering algorithm. |
| **Example:**<br>• Clustering animals by physical features.<br>• Grouping news articles by topic.<br>• Social network analysis. | **Example:**<br>• Classifying emails as spam or not spam.<br>• Predicting whether a tumour is benign or malignant.<br>• Medical diagnosis. |

# Regression vs Classification:

| Regression | Classification |
|---|---|
| 1)It is a supervised learning technique. | 1)It is a supervised learning technique. |
| 2) predicts a continuous output based on input features. | 2The goal is to predict the category or class of new data points. |
| 3) Produces a continuous numerical value | 3) Produces a discrete output |
| 4) Used when the objective is to predict a continuous variable | 4) Used when the objective is to categorize data into predefined labels |
| **5)Algorithms**: Linear Regression, Polynomial Regression, Decision Trees for Regression, Random Forest Regression, K-NN Regression, Neural Networks. | 5)**Algorithms:** k-means clustering algorithm, Fuzzy c-means clustering algorithm, Gaussian (EM) clustering algorithm. |
| **Example:**<br>• Predicting house prices based on location and size.<br>• Forecasting stock prices. | **Example:**<br>• Classifying whether a patient has a disease.<br>• Classifying an email as spam or not spam. |