AI ?

The ability of machines to perform complex tasks which generally required human intelligence.

What is ML ?

The ability of machines to learn from the data without being explicitly programmed. It is the most successful approach to AI.

How machines are learning from the data ?

Algorithms → based on statistical and probability techniques.

Supervised learning :

It is the branch of machine learning used to perform predictive analytics. It has labelled data.

Unsupervised learning :

It is used for clustering the data and dimensionality reduction. It has unlabelled data.

Using supervised learning, we can solve two types of problems :

- **Regression**

  If the target variable is continuous, we use regression algorithms.

- **Classification**

  If the target variable is categorical, we use classification algorithms.

Data →

Features (X) : columns using which we make predictions. They are also called independent variables.

Target Variable (y) : The variable we want to predict is called target variable. It should be dependent on the features. It is also called as label or dependent variable.

Regression :

- **Linear Regression**

  Simple linear regression : predicting target variable on the basis of one feature
  Eg : No.of bedrooms vs house price

  Multiple linear regression : predicting target variable on the basis of multiple features
  Eg : No.of bedrooms, area of house vs house price

- **Non Linear Regression**

  If features do not form a linear relationship with the target variable.

Scikit-Learn : To practically implement machine learning in python, we can use the sklearn library.

To install the library, we use the name scikit-learn :

pip install scikit-learn

To import the library, we use the name sklearn

Import sklearn

Steps involved in building ML Models :

- Import the dataset, determine your target variable
- Determine the problem based on your target variable
- Divide data into X and y (X is features and y is target)
- Split data into train and test (to evaluate the model)
- Import the algorithm
- Train the model by passing train data into algorithm
- predict using X_test
- Compare predictions with y_test

Linear Regression :

Aim : To create a straight line on the plane which should touch the maximum data points.
Formula : y = mx + c

Evaluation Metrics for Regression :

R squared Score : It gives accuracy of the regression model
RMSE : It gives the error in the model