## SUPERVISED LEARNING:

*Supervised machine learning is a type of machine learning where the algorithm is trained on a labeled dataset, meaning that the input data used for training is paired with corresponding output labels. The goal is for the algorithm to learn mapping from the input to the output, so that it can make predictions or classifications on new, unseen data.*

example: spam filtering

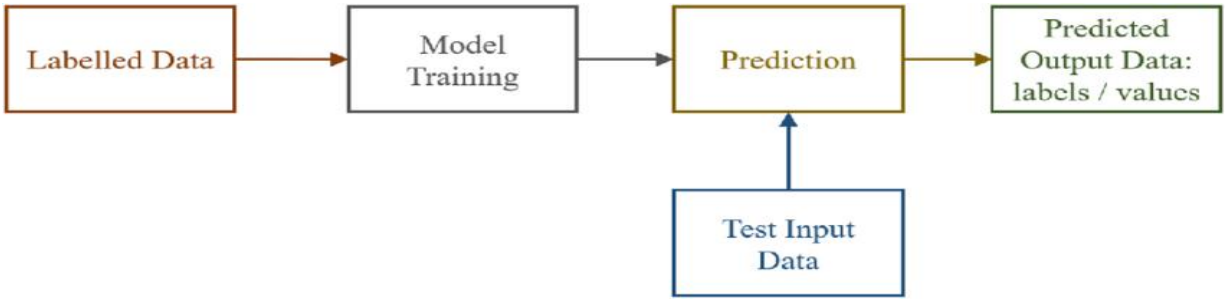


*Fig***:** *Flowchart of supervised learning methods (source: ResearchGate)*

## TYPES:

### 1. Regression:

*Regression is a type of supervised learning where the goal is to predict a continuous numerical output or value.*

**Example**: Predicting house prices based on features like square footage, number of bedrooms, and location is a regression problem. The algorithm learns to predict a numerical value (the price) for new houses based on the learned relationships from the training data.

some popular regression types are:

-Liner Regression

-Polynomial Regression

-Regression Trees

**2. Classification:**

*Classification is a type of supervised learning where the goal is to predict the categorical class or label of new instances based on past observations.*

**Example**: Spam email detection is a classic classification problem. Given a set of emails labeled as spam or not spam, a classifier can learn to predict whether a new, unseen email is likely to be spam or not.

*some popular classification types are*:

-Random Forest
-Decision Trees
-Logistics Regression
-Support Vector Machine

**ADVANTAGES OF SUPERVISED LEARNING:**

-Have full control over what the machine is learning
-You can easily test and debug your model
-You can determine the number of classes

**DISADVANTAGES OF SUPERVISED LEARNING:**

-Have limited scope
-Collecting labelled dataset is expensive and time consuming
-Wrong prediction and cannot predict on its own is not labelled