**Machine Learning**

Machine learning is a way for computers to learn from data and make predictions or decisions without being specifically programmed.

There are **two main types** of machine learning:

**Supervised vs. Unsupervised Learning**

**Supervised Learning**

You have input data **and** the correct output (also called a label).

Has x and y variables.

X = The Feature (Independent variable)

Y = The Target (Dependant variable)

The goal is for **the model to learn to predict the output from the input.**

**Examples**

* Predicting house prices (input = size, location; output = price).
* Predicting if an email is spam or not.

**Unsupervised Learning**

You only have input data no output.

Has only x variable.

X = only the data we want the model to use.

The goal is for the model to find patterns or groups in the data.

**Examples**:

* Customer segmentation (grouping similar customers eg grouping by customer age).
* Purchase analysis (finding products that are often bought together eg milk and bread).

**Regression vs. Classification**

**Regression**

It involves predicting a **number**.

**Examples**:

* Predicting house prices.
* Predicting list prices in our orders dataset.

**Classification**

It involves predicting a **category**.

**Examples**:

* Predicting whether a customer will cancel a subscription (Yes/No).
* Predicting a product type (Electronics, Clothing, Food).