***Machine Learning Basics***

**1. Supervised Machine Learning**

* **Definition:** Learning from labelled data with clear input-output pairs.
* **Example:** Predicting house prices based on features like size and location.
* **Key Points:** Uses known outcomes to train models for prediction tasks like classification (categories) and regression (values).

**2. Unsupervised Machine Learning**

* **Definition:** Finding patterns in unlabelled data without predefined outcomes.
* **Example:** Grouping similar customer behaviours without prior categories.
* **Key Points:** Focuses on discovering structures and relationships within data through clustering and dimensionality reduction.

**3. Reinforcement Learning**

* **Definition:** Learning by trial and error through interactions with an environment.
* **Example:** Teaching AI agents to play games by rewarding good decisions and penalizing bad ones.
* **Key Points:** Maximizes cumulative rewards over time, used in autonomous systems and game playing.

**4. Classification vs Regression vs Clustering**

**Classification:** Sorting data into predefined categories spam detection.

**Example:** Spam detection.

**Regression:** Predicting continuous values

**Example:** House prices.

**Clustering:** Discovering natural groupings in data without predefined labels

**Example:** Customer segmentation.