**Unsupervised Learning**

**Definition:**

* **Unsupervised learning** deals with data where the correct output or structure is unknown or unlabelled.
* It focuses on finding patterns and relationships among variables within the data.
* There's no feedback or correction based on prediction results.

**Types:**

1. **Clustering**: Grouping data into clusters or segments based on similarities among variables.
2. **Non-Clustering**: Finding structure within data without necessarily grouping them.

**Examples:**

**Clustering:**

* **Gene Grouping**: Automatically grouping 1,000,000 different genes into similar groups based on variables like lifespan, location, roles, etc.

**Non-Clustering:**

* **Cocktail Party Algorithm**: Identifying individual voices and music from a mixture of sounds in a chaotic environment (e.g., at a cocktail party).

**Key Points:**

* **Flexibility**: Unsupervised learning can be applied when the outcome or effect of variables is unknown.
* **Pattern Recognition**: It excels in uncovering hidden patterns and structures within the data.
* **No Supervision**: Unlike supervised learning, there's no guidance or correct answers to guide the learning process.
* **Applications**: From biology to sound processing, unsupervised learning has diverse applications in various fields.

**Conclusion:**

Unsupervised learning offers a powerful approach for analyzing data when the desired outcomes are unknown or the relationships among variables are unclear. By clustering or identifying structures, unsupervised learning algorithms can reveal insights and patterns that may be unobservable through other means. It's a valuable tool for exploratory data analysis and complex problem solving.Top of FormBottom of Form