

What is AI?

- AI refers to simulated intelligence by machines, resembling human intelligence.
- Examples: Chatbots with pre-programmed responses.

AI vs. ML (Machine Learning):

- **AI:** General term for machines that simulate intelligence.
- **ML:** Subfield of AI where machines learn from data and improve over time.
 - **Example:** A model that learns responses from chat logs.

Machine Learning Types

1. Supervised Learning:

- **Definition:** Model learns from labeled data.
- **Example:** Classifying traffic light colors (Red, Yellow, Green) based on image data.

2. Unsupervised Learning:

- **Definition:** Model identifies patterns from unlabeled data.
- **Example:** Clustering words based on their semantic vectors.

3. Reinforcement Learning:

- **Definition:** Model learns to make decisions by receiving rewards or penalties.
- **Example:** Learning to play a game by maximizing rewards through trial and error.

Deep Learning

- **Definition:** A subset of machine learning using neural networks to model complex problems.
- **Application:** Can be applied to supervised, unsupervised, and reinforcement learning tasks.

Machine Learning in Data Science:

- ML can be used to analyze and predict trends from data.
- Not all data analysis involves ML; simple visualizations do not.