Machine learning (ML) is a subset of artificial intelligence (AI) that focuses on developing systems that learn from data and improve their performance over time without being explicitly programmed. It involves building mathematical models to make predictions or decisions based on data.

There are three main types of machine learning:

1. Supervised Learning: The model is trained on labeled data.

2. Unsupervised Learning: The model is trained on data without labels and finds patterns.

3. Reinforcement Learning: The model learns by receiving rewards or penalties based on its actions.

Some common ML algorithms include:

- Linear Regression

- Decision Trees

- Random Forest

- Support Vector Machines

- Neural Networks

Applications of ML include spam filtering, recommendation systems, image recognition, natural language processing, and autonomous vehicles.

Challenges in ML include overfitting, data quality, interpretability, and ethical considerations.