Artificial Intelligence (IT-511)

Assignment no. 6

**Question no. 1 :**

What is Machine learning?

**Answer :**

Machine learning is a branch of artificial intelligence that enables machines to learn from data and improve their performance without being explicitly programmed. [Machine learning algorithms can analyze patterns, make predictions, and provide insights from large and complex data sets](https://bing.com/search?q=machine+learning+definition" \t "https://edgeservices.bing.com/edgesvc/_blank).

**Question no. 2 :**

Write down types of Machine learning with real-life examples ?

**Answer:**

Following are the different types of machine learning :

* **Supervised learning:**

This type of machine learning uses labeled data to train a model that can make predictions or classifications based on new input data.

[For example, a supervised learning algorithm can learn to identify spam emails by using a dataset of emails labeled as spam or not spam](https://www.geeksforgeeks.org/types-of-machine-learning/" \t "https://edgeservices.bing.com/edgesvc/_blank)

* **Unsupervised learning:**

This type of machine learning uses unlabeled data to find patterns, clusters, or hidden structures in the data.

[For example, an unsupervised learning algorithm can learn to segment customers based on their purchase behavior without knowing their demographic information](https://www.geeksforgeeks.org/types-of-machine-learning/)

* **Semi-supervised learning:**

This type of machine learning uses a combination of labeled and unlabeled data to train a model that can improve its performance with less human intervention.

[For example, a semi-supervised learning algorithm can learn to recognize faces by using a small set of labeled images and a large set of unlabeled images](https://www.geeksforgeeks.org/types-of-machine-learning/)

* **Reinforcement learning:**

This type of machine learning uses a trial-and-error approach to learn from its own actions and feedback from the environment.

[For example, a reinforcement learning algorithm can learn to play a video game by trying different actions and receiving rewards or penalties based on the game outcomes](https://www.geeksforgeeks.org/types-of-machine-learning/" \t "https://edgeservices.bing.com/edgesvc/_blank)

**Question no. 3 :**

Differentiation between different types of Machine learning.

**Answer:**

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| --- | --- | --- | --- |
| **Supervised machine learning** | **Unsupervised machine learning** | **Semi-supervised machine learning** | **Reinforcement learning** |
| This type of machine learning involves using labeled data to train a model that can make predictions or classifications based on new input data. | This type of machine learning involves using unlabeled data to discover patterns, structures, or hidden features in the data. | This type of machine learning involves using a combination of labeled and unlabeled data to train a model that can make predictions or classifications based on new input data. | This type of machine learning involves using an agent that interacts with an environment and learns from its own actions and rewards. |
| [Supervised machine learning algorithms include linear regression, logistic regression, decision trees, support vector machines, k-nearest neighbors, and neural network](https://www.geeksforgeeks.org/types-of-machine-learning/" \t "https://edgeservices.bing.com/edgesvc/_blank) | [Unsupervised machine learning algorithms include k-means clustering, hierarchical clustering, principal component analysis, independent component analysis, and generative adversarial networks](https://www.geeksforgeeks.org/types-of-machine-learning/" \t "https://edgeservices.bing.com/edgesvc/_blank) | [Semi-supervised machine learning algorithms include self-training, co-training, graph-based methods, and semi-supervised support vector machines](https://www.geeksforgeeks.org/types-of-machine-learning/" \t "https://edgeservices.bing.com/edgesvc/_blank) | [Reinforcement learning algorithms include Q-learning, SARSA, policy gradient methods, and deep reinforcement learning](https://www.geeksforgeeks.org/types-of-machine-learning/" \t "https://edgeservices.bing.com/edgesvc/_blank) |