**ASSIGNMENT-3**

1. **Explain the term machine learning, and how does it work? Explain two machine learning applications in the business world. What are some of the ethical concerns that machine learning applications could raise?**

**Ans:- Machine Learning:-** Machine learning provide stats tools to analyze,visualize and perform prediction and other task with the help of data.

Machine learning uses two types of techniques: supervised learning, which trains a model on known input and output data so that it can predict future outputs, and unsupervised learning, which finds hidden patterns or intrinsic structures in input data.

### Machine learning application:- 1.Decision support

### Market research and customer segmentation

### some of the ethical concerns that machine learning applications could raise:-

### Cost of innovation

### Harm to physical integrity

### Lack of access to public services

**2. Describe the process of human learning:**

**i. Under the supervision of experts**:- Human-guided machine learning is a process whereby subject matter experts accelerate the learning process by teaching the technology in real-time. For example, if the machine learning model comes across a piece of data it is uncertain about, a human can be asked to weigh in and give feedback.

**ii. With the assistance of experts in an indirect manner:-**

Indirect guidance is provided through learners actively observing, listening, and engaging with social practices and norms, which serve to furnish models and goals for performance and individuals' learning

**iii. Self-education:-**

Self-directed learning is a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning

**3.Provide a few examples of various types of machine learning.**

**Ans:-** **Machine learning is a subset of AI, which enables the machine to automatically learn from data, improve performance from past experiences, and make predictions.** Machine learning contains a set of algorithms that work on a huge amount of data. Data is fed to these algorithms to train them, and on the basis of training, they build the model & perform a specific task.

These ML algorithms help to solve different business problems like Regression, Classification, Forecasting, Clustering, and Associations, etc.

Based on the methods and way of learning, machine learning is divided into mainly four types, which are:

1. Supervised Machine Learning
2. Unsupervised Machine Learning
3. Semi-Supervised Machine Learning
4. Reinforcement Learning

**4.Examine the various forms of machine learning.**

**Ans:-** The three machine learning types are supervised, unsupervised, and reinforcement learning.

1. Supervised learning:-Supervised learning is effective for a variety of business purposes, including sales forecasting, inventory optimization, and fraud detection. Some examples of use cases include:

* Predicting real estate prices
* Classifying whether bank transactions are fraudulent or not
* Finding disease risk factors
* Determining whether loan applicants are low-risk or high-risk
* Predicting the failure of industrial equipment's mechanical parts

2. Unsupervised learning:-

* This type of machine learning is widely used to create predictive [models](https://www.coursera.org/articles/machine-learning-models). Common applications also include clustering, which creates a model that groups objects together based on specific properties, and association, which identifies the rules existing between the clusters. A few example use cases include:
* Creating customer groups based on purchase behavior
* Grouping inventory according to sales and/or manufacturing metrics
* Pinpointing associations in customer data (for example, customers who buy a specific style of handbag might be interested in a specific style of shoe)

1. Reinforcement Learning:-

* Reinforcement learning is the closest machine learning type to how humans learn. The algorithm or agent used learns by interacting with its environment and getting a positive or negative reward. Common algorithms include temporal difference, deep adversarial networks, and Q-learning.

**5. Can you explain what a well-posed learning problem is? Explain the main characteristics that must be present to identify a learning problem properly.**

6. Is machine learning capable of solving all problems? Give a detailed explanation of your answer.

7. What are the various methods and technologies for solving machine learning problems? Any two of them should be defined in detail.

8. Can you explain the various forms of supervised learning? Explain each one with an example application.

9. What is the difference between supervised and unsupervised learning? With a sample application in each region, explain the differences.

10. Describe the machine learning process in depth.

a. Make brief notes on any two of the following:

MATLAB is one of the most widely used programming languages.

ii. Deep learning applications in healthcare

iii. Study of the market basket

iv. Linear regression (simple)

11. Make a comparison between:-

1. Generalization and abstraction

2. Learning that is guided and unsupervised

3. Regression and classification