Assignment # 06:-

Question Statement:-

What is machine Learning? Types of machine Learning with the real life example and differentiation between different types of Machine Learning.

Machine Learning :-

Machine Learning is the branch of AI and computer science which focuses on the use of data and algorithums to imitate the way that humans learn, gradually improving its accuracy.

Machine learning is a important component of the growing field of the data science. Through the use of stratistical method algorithms are trained to make classifications or predictions and to uncover key insights in data mining projects. These insights subsequently drive decision making an application and businesses ideally impacting key growth metrics. As big data continues to expand and grow, the market demand for data scientists will increase. They will be required to help identify the most relavent business question and the data

to answer them. Machine learning algorithms are typically created using frameworks that accelerate solution development, such as Tensorflow and pytorch.

Real world Examples of Machine Learning:-

When the Average persons think about the machine learning, it may feel overwhelming, complicated and perhaps intangible, conjuring up images of futuristic robots taking over the world. As more organizations and people reply on ML models to manage to growing volumers of data, instances of machine learning are occuring in front of and around us daily - whether we notice or not. What's exciting to see how to improve our quality of life supported quicker and more effective execution of some business operations and industries and uncovering pattern that humans are likely to miss.

Here are some examples of ML in real life

- Facial Recognition
- Product Recommendations
- Email automation and spam filtering
- Financial accuracy
- Social media optimization

1. **Facial Recognition:-**

It is one of the more obvious applications of Machine learning. People previously received name suggestions for their mobile photos and Facebook tagging, but now someone is immediately tagged and verified by comparing and analyzing patterns through the facial contours. Facial recognization paired with deep learning.

2. **Product Recommendation:-**

Target marketing with the retail uses machine learning to group customers based to the buying habits or demographic similarities and by extraplobing with one person may want from someone else purchases. While some suggested purchase pairing are obvious, machine learning can get early accurate by finding the hidden relationships in data and predicting what you want before you know you want it.

3. **Email automation and spam filtering:-**

While your inbox seems relatively boring machine

learning influences its function behind the scenes. Email automation is a direct result of successful machine learning, and one function that goes most unnoticed is spam filtering. Successful spam filtering adapts and finds patterns in Email content that is undesirable. That includes data from email domains, a senders physical location message text and structure and IP address.

4. Financial Accuracy:-

ML has created a boon for the financial industry as most system go digital. Abdunace financial transactions that can't be monitored by human eyes are easily analyzed thanks to machine learning which helps finds to fraudulent transactions. One of the newest banking features is the ability to deposite a check straight from your phone by using handwriting and image recognization read check and convert into digital text.

5. Social Media Optimization:-

Platforms from facebook to Instagram are using big data and artificial intelligence to enhance their functionality.

and strengthen the user experience. Machine learning has become helpful in fighting to inappropriate content to cyberbullying which pose a risk to platforms in losing user and weakening brand loyalty.

Differentiate between types of Machine learning:-

There are three different types of ML.

1. Supervised learning
2. Unsupervised learning
3. Semi-Supervised learning

Supervised Learning:-

It is defined by its use of labeled datasets to train algorithm to classify data or predict outcome accuracy. Input data is fed into the model, the model adjusts its weights until it become fitted appropriatly. This occur as part of Cross validation process to ensure that the models avoids overfitting or the underfitting. Supervised learning helps the organizations solve a variety of real-world problems at scale such as classifying spam in a separate form your inbox. Some methods of the supervised learning include neural networks, logistics regression, random forest and support vector machine (SVM).

Unsupervised Learning:-

This uses machine learning algorithms to analyze and cluster unlabeled datasets. These algorithms discover hidden patterns or data grouping without the need of human intervation.

This method's ability to discover the similarities and differences in information make it ideal for exploratory data analysis, cross selling strategies customers segmantations and image and pattern recognization. It also reduce the number of features in a model through dimentions.

Semi-Supervised Learning:-

Semi-Supervised learning offers a happy medium between supervised and unsupervised learning. During learning it uses a smaller labled data sets to guide the classification and features extraction from a larger unlabled data set.

Differientiation Table.

Catagories	Supervised	Unsupervised	Semi-supervised
Data	Labeled data	No labels / targets	Desicision Processes
Feedback	Direct feedback	No - feedback	Reward system
Method.	Predict outcome	Future hidden structured data	learn Series of action