**MACHINE LEARNING**

**1. INTRODUCTION**

**1.1 What is Machine Learning?**

* Machine learning is an application of artificial intelligence (AI).
* ML provides systems the ability to automatically learn and improve from experience without being explicitly programmed.
* Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.
* The process of learning begins with observations or data, such as examples, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the examples that we provide.
* The primary aim is to allow the computers learn automatically without human intervention or assistance and adjust actions accordingly.

**1.2 Examples of ML Applications –**

1. Traffic Alerts on Google Maps :

Google Maps know that we are on the fastest route despite the traffic is high.

It is a combination of multiple factors like how many people are currently using the services of Google Maps, historic data of that route, and some real-time techniques.

While we use Google maps, we are allowing the app to use data like:

* + Our location
  + Our average travelling speed
  + Answers to the questions like ‘does the route still have traffic’?
  + Day, time, and any specific occasion.

All such data is captured and stored by the application. By using this data, AI & machine learning algorithms make the right conclusions and give you the exact information.

1. Image Recognition :

Now-a-days, we can unlock a Smartphone simply by looking at it.

The high-end camera of your phone recognizes 80 nodal points on a human face and machine learning technologies to measure the variable of a person’s face and unlock the phone.

Phone unlocking is now among common machine learning applications.

We use face recognition to make quick bank payments.

Other image recognition uses are Drones, Manufacturing, Self-driving cars, Military surveillance, Forest Activities.

1. Sentiment Analysis :

Sentiment analysis is a top-notch machine learning application that refers to sentiment classification, opinion mining, and analyzing emotions.

Using this model, machines groom themselves to analyze sentiments based on the words.

They can identify if the words are said in a positive, negative, or neutral notion. Also, they can define the magnitude of these words.

1. Product Recommendation :

While shopping on eCommerce brands like Amazon and Flipkart, you get to see recommended items or options like ‘users who bought this product also bought’, ‘users also buy this along with this product’!

All these are the outcomes of advanced machine learning training wherein the system learns individual patterns of users and suggests new or additional products to buy.

1. **Online support using Chatbots :**

When you use any application say some banking app, you see an option called *‘*chat with us’. So these are chatbots running on the concepts of machine learning.

These bots can recognize the type of questions, and accordingly, give quick answers to resolve the query by extracting the right parameters.

To give precise solutions, these bots also use a technique called decision trees in machine learning.

Depending upon the business models, the types of questions and answers change.

Thus, decision trees help the machine to learn quickly and satisfy the clients.

1. Google Translate :

Travelling to a new place is always thrilling but the only enigma is to understand the common language of that place.

To solve this dilemma, Google has launched an app that can help in easy translation of any language.

Google uses ‘Google Neural Machine Translation’ that has the ability to absorb thousands of languages, words, and dictionaries and transmute any sentence in the desired language.

**1.3 Training vs. Testing**