**week - 01**

**Machine learning**

Machine learning was coind by a computer gamer named *Arthur samuel* in 1959. he definied it as:

field of study that give computers the ability to learn and make predictions without being explicitly programmed.

**Application of mechaine learning**

**\* virtual personal assistancce**

example: google assistant,alexa,cortanasiri,

\* they help us to improve in our life in many ways

for example transulate something or make a call or to fix an appoinment

\* firstly they record what ever we say send it over to a server decode it with the help of mechain learning and neural network and then provide us with an output

**\* Traffic prediction**

if we whant to travel from one place to another or els we whant shift from one position to another the first thing we do is to get on google maps

when we type in a place and then we can observe we will get the way in the combo of blue yellow and reb which signifies

blue for clear road

yellow indicates the slight conjucted with vehchils

red means heavily conjusted

so how exactly google is able to do this

( yes, thats exactly with mechain learning )

with the help of 2 importent mechains

\* average time taken on specific days at specific times on a route

\* real time location data of vehicles from google maps application and sensors

**\* social media personalization**

when we are intrested in an item for example a pretty dress but have ignored it for some reason after leaving the site we can see the advatisement of the prodect in every site like youtube instagram and facebook etc,.

with the help of machine learning google understood that i was intrested in perticular product

**\* Email spam filtering**

we know that gmail has an entire collection of emails which has alredy labeled as spam or not spam afer analising the data from the mails gmail is able to find some charactristics by words like lottry or winner ,any email that pops into gmail goes through this spam filters

some of the filters:

\* content filter

\* header filters

\* general blacklist filters

\* rules-based filters

\* premission filters

\* challenge-response filters

**\* online fraud detection**

there are several ways that an online fraud can take place like idebtity theft, fake account(account only last how long the transaction takes place and stop existion after that ), man in the middle attacks ( stealing the money while the transaction in the process)

the feed forward neural network method detects weather transactions is genuin or fake

the outputs are converted into hash values and this values becomes the inputs for the next round

for every real transaction thet takes place there is a spectific pattern a fraud trnsation stands out because of the significent changes that cause with the hash values

**\*stock market trading**

mechain learning is used extensivly when it comes to trade market,predictive analysis, identifying patterns, and making informed investment decisions. algorithms analyze historical data, market trends, and indicators to predict future price movements, optimize trading strategies, and manage risks. techniques such as reinforcement learning and deep learning are used to develop models that adapt to changing market conditions. by leveraging vast amounts of data, machine learning aids traders in detecting opportunities, minimizing losses, and maximizing returns, enhancing overall trading performance in dynamic financial markets. they use long short term memory neural networks

**\* assistive medical technology**

with the help of mechain learning we diagnose the diseases medical fields machine learning will disrupt:

\* disease identification

\* personalized treatment

\* drug discovery

\* clinical research

\* radiology

**\* Automatic translation**

the technology behind this is sequence-to sequence learning which is the same algorithm used in chatbots, image recognitition happens through converlutnal optical character recognition further, seq-to-seq algorithm is used to translate the text from one language to another

**\*Future-proofing of career**

learning about artificial intelligence and machine learning can help us make shre of career stay strong in future . As more jobs change because of automation and new technology,knowing about things can keep you compatitive and prepared for what’s comming in the job market.

**WHY? WE SHOULD LEARM MACHINE LEARNING:**

learning machine learning is essiential for graspinf data-driven decision making, which inderpins modrem advancements.it unlocks career opportunities across diverse sectors, from finance to healthcare, fostering innovation and driving efficiency. as automation continues to reshape industries, understanding machine learning ensures relevance in an evolving job market, where expertise in advanced technologies in increasing prized.by mastering machine learning, individual gain the skills needed to thrive in digitally-driven economy, shaping the future of work and innovation.

**why python in mechine learning:**

Python is widely used in machine learning due to its simplicity, rich ecosystem, and community support. Key libraries like TensorFlow and scikit-learn provide powerful tools for building and deploying machine learning models. Its seamless integration with big data technologies such as Apache Spark and Hadoop enables scalable data processing. Python's popularity in industry and academia ensures a wealth of resources and skilled practitioners. Its readability and ease of use make it accessible to beginners while still providing advanced capabilities for experienced developers. Python's flexibility allows for integration with other languages and tools, enhancing its versatility in machine learning workflows. The vibrant Python community contributes to ongoing development, documentation, and support for machine learning projects. Key factors driving Python's dominance in machine learning include its simplicity, extensive libraries, large community, seamless integration with big data technologies, and widespread industry adoption. Overall, Python's combination of simplicity, power, and community support make it the language of choice for machine learning and data science applications.

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