AI, ML & Dl U-1

AI :-

What is AI :-

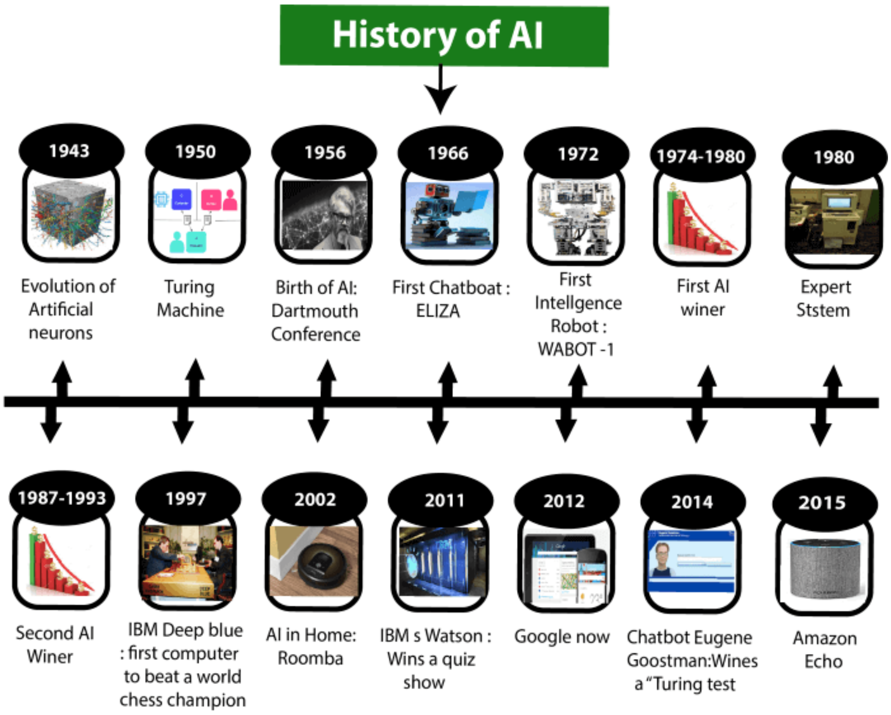
Artificial intelligence (AI) is **a branch of computer science that focuses on building and managing technology that can learn to autonomously make decisions and carry out actions on behalf of a human being**.

Approaches of AI :-

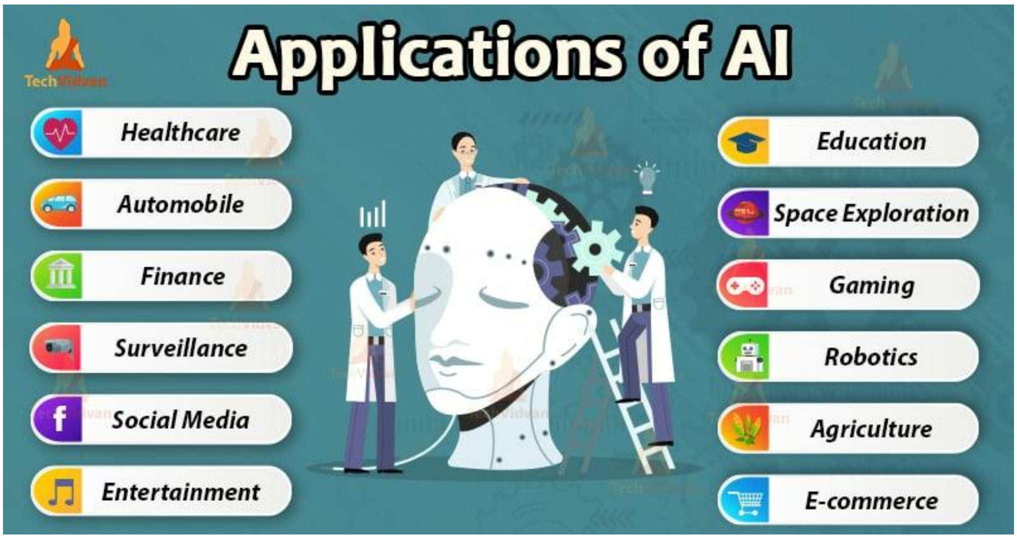
There are several approaches to AI, including:

1. **Machine learning:** This approach involves building algorithms that can learn patterns in data and make predictions based on that data.
2. **Natural language processing (NLP):** This approach deals with the interaction between computers and humans through natural language. It involves tasks such as text and speech recognition, translation, and sentiment analysis.
3. **Robotics:** This approach involves the use of AI to design, build, and control robots. It involves tasks such as perception, decision-making, and movement.
4. **Computer vision:** This approach deals with the processing and analysis of visual information from the real world. It involves tasks such as image recognition, object detection, and scene understanding.

History of AI :-


History of AI
1943
Evolution of Artificial neurons
1950
Turing Machine
1956
Birth of AI: Dartmouth Conference
1966
First Chatboat : ELIZA
1972
First Intellgence Robot : WABOT -1
1974-1980
First AI winer
1980
Expert Ststem
1987-1993
Second AI Winer
1997
IBM Deep blue : first computer to beat a world chess champion
2002
AI in Home: Roomba
2011
IBM s Watson : Wins a quiz show
2012
Google now
2014
Chatbot Eugene Goostman:Wines a "Turing test
2015
Amazon Echo

Applications of AI :-



Explain all the points according to your convinence

How Does AI works :-

- AI works by combining large amounts of data with fast, iterative processing and intelligent algorithms, allowing the software to learn automatically from patterns or features in the data.
- AI is a broad field of study that includes many theories, methods and technologies, as well as the following major subfields:

- **Machine learning** automates analytical model building. It uses methods from neural networks, statistics, operations research and physics to find hidden insights in data without explicitly being programmed for where to look or what to conclude.

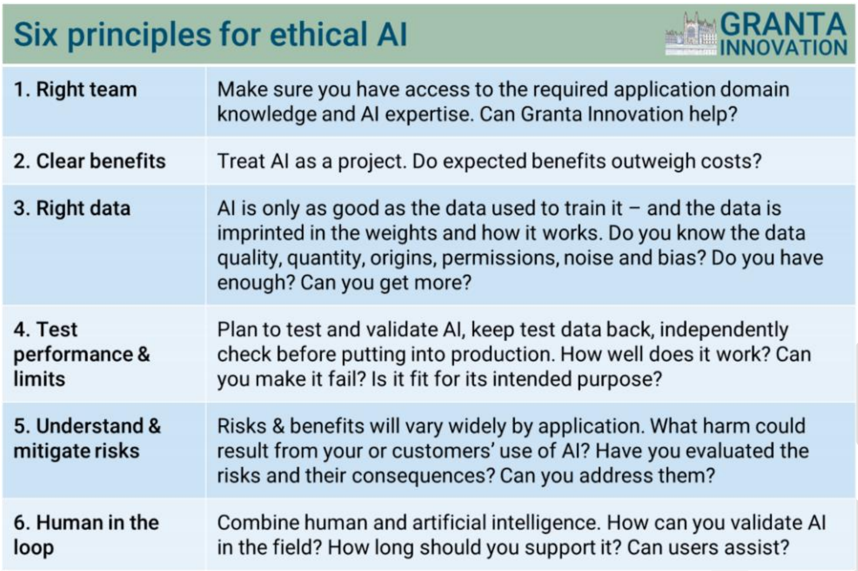
- **A neural network** is a type of machine learning that is made up of interconnected units (like neurons) that processes information by responding to external inputs, relaying information between each unit. The process requires multiple passes at the data to find connections and derive meaning from undefined data.

- **Deep learning** uses huge neural networks with many layers of processing units, taking advantage of advances in computing power and improved training techniques to learn complex patterns in large amounts of data. Common applications include image and speech recognition.

- **Computer vision** relies on pattern recognition and deep learning to recognize what's in a picture or video. When machines can process, analyze and understand images, they can capture images or videos in real time and interpret their surroundings.

- **Natural language processing** (NLP) is the ability of computers to analyze, understand and generate human language, including speech. The next stage of NLP is natural language interaction, which allows humans to communicate with computers using normal, everyday language to perform tasks.

Ethics of AI :-



Six principles for ethical AI

GRANTA INNOVATION

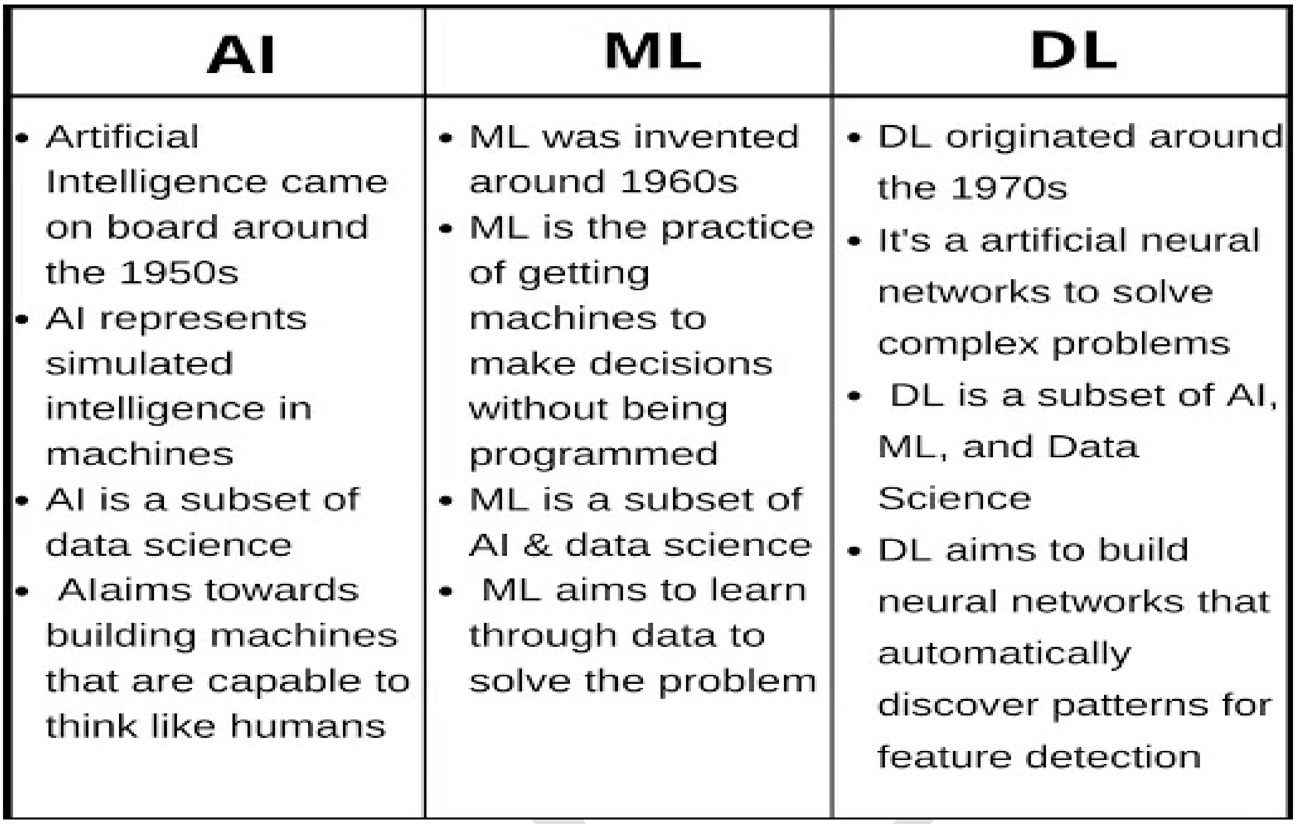
1. Right team	Make sure you have access to the required application domain knowledge and AI expertise. Can Granta Innovation help?
2. Clear benefits	Treat AI as a project. Do expected benefits outweigh costs?
3. Right data	AI is only as good as the data used to train it – and the data is imprinted in the weights and how it works. Do you know the data quality, quantity, origins, permissions, noise and bias? Do you have enough? Can you get more?
4. Test performance & limits	Plan to test and validate AI, keep test data back, independently check before putting into production. How well does it work? Can you make it fail? Is it fit for its intended purpose?
5. Understand & mitigate risks	Risks & benefits will vary widely by application. What harm could result from your or customers' use of AI? Have you evaluated the risks and their consequences? Can you address them?
6. Human in the loop	Combine human and artificial intelligence. How can you validate AI in the field? How long should you support it? Can users assist?

Application of AI in CyberSecurity :-

- Security screening
- Security & crime prevention
- Analyze mobile endpoints
- AI-powered threat detection
- Detection of sophisticated cyber-attacks
- Reducing Threat Response Time

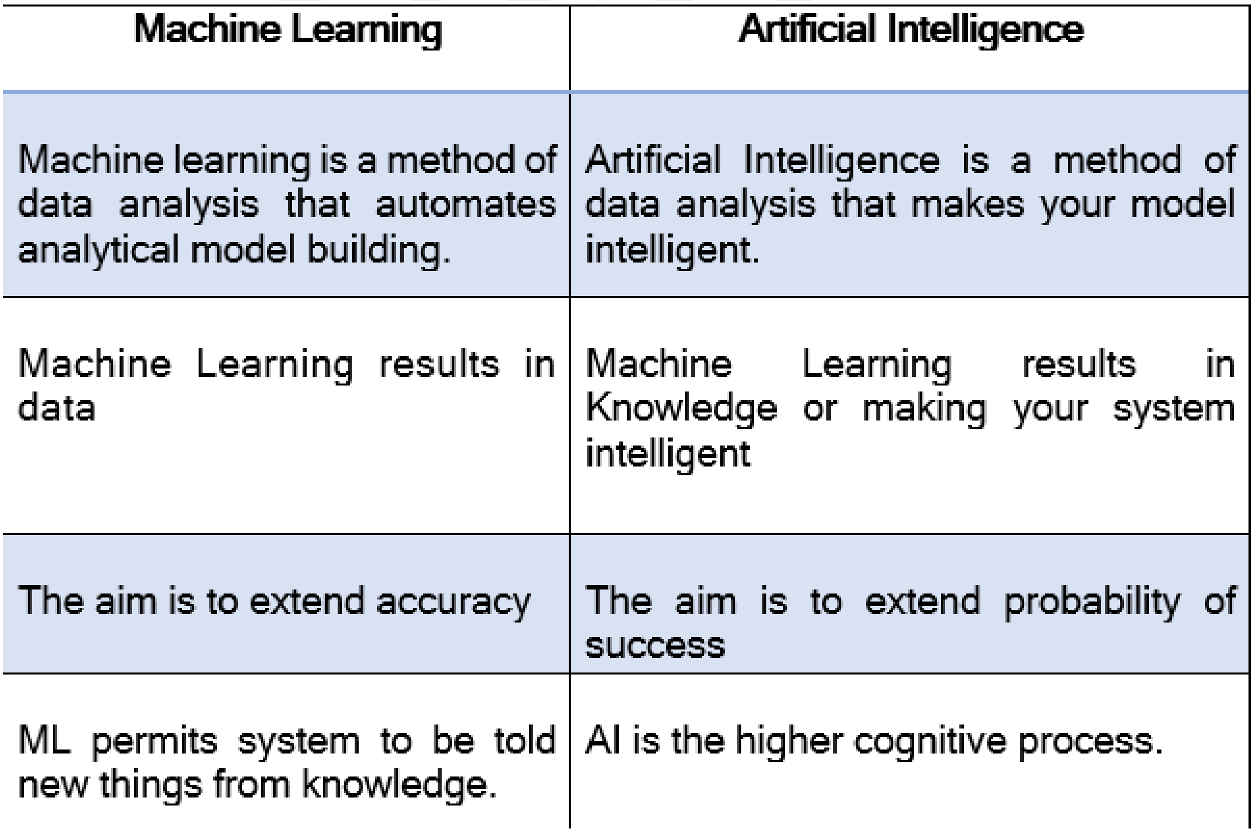
Explain above points according to your convinence

Difference between AI, ML & DL



AI	ML	DL
• Artificial Intelligence came on board around the 1950s • AI represents simulated intelligence in machines • AI is a subset of data science • Alaims towards building machines that are capable to think like humans	• ML was invented around 1960s • ML is the practice of getting machines to make decisions without being programmed • ML is a subset of AI & data science • ML aims to learn through data to solve the problem	• DL originated around the 1970s • It's a artificial neural networks to solve complex problems • DL is a subset of AI, ML, and Data Science • DL aims to build neural networks that automatically discover patterns for feature detection

Difference between working of AI & ML



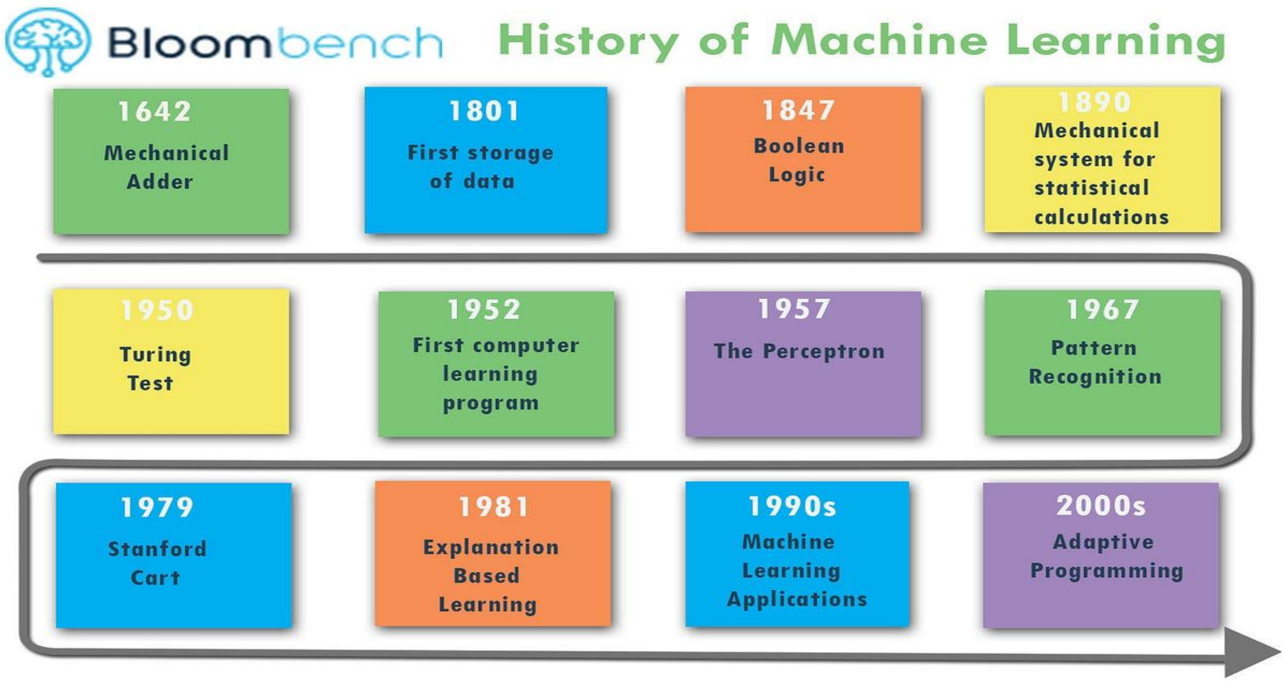
Machine Learning	Artificial Intelligence
Machine learning is a method of data analysis that automates analytical model building.	Artificial Intelligence is a method of data analysis that makes your model intelligent.
Machine Learning results in data	Machine Learning results in Knowledge or making your system intelligent
The aim is to extend accuracy	The aim is to extend probability of success
ML permits system to be told new things from knowledge.	AI is the higher cognitive process.

Machine Learning:

What is ML :-

Machine learning is a branch of artificial intelligence (AI) and computer science that aims to teach computers how to learn and act without being explicitly programmed

History of ML :-



Bloombench History of Machine Learning

1642 Mechanical Adder

1801 First storage of data

1847 Boolean Logic

1890 Mechanical system for statistical calculations

1950 Turing Test

1952 First computer learning program

1957 The Perceptron

1967 Pattern Recognition

1979 Stanford Cart

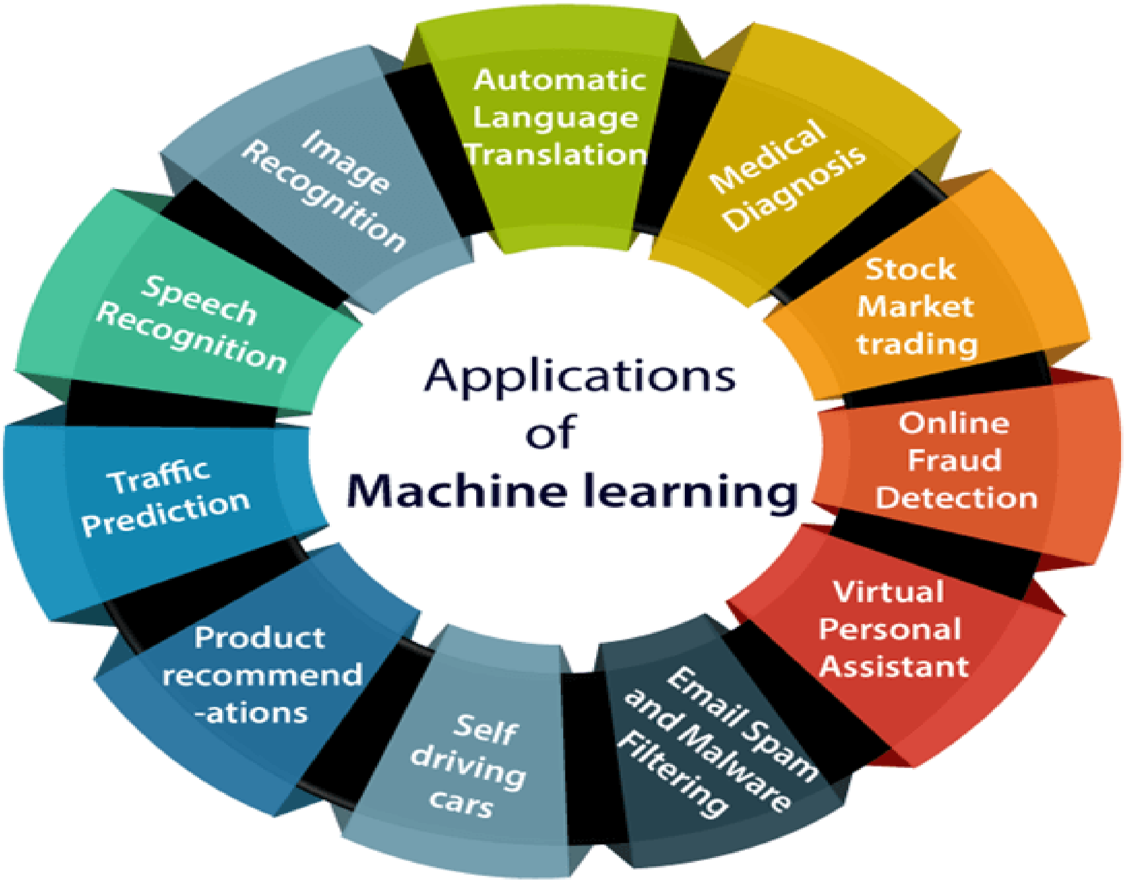
1981 Explanation Based Learning

1990s Machine Learning Applications

2000s Adaptive Programming

Explain above points according to your convinence

Application of ML :-

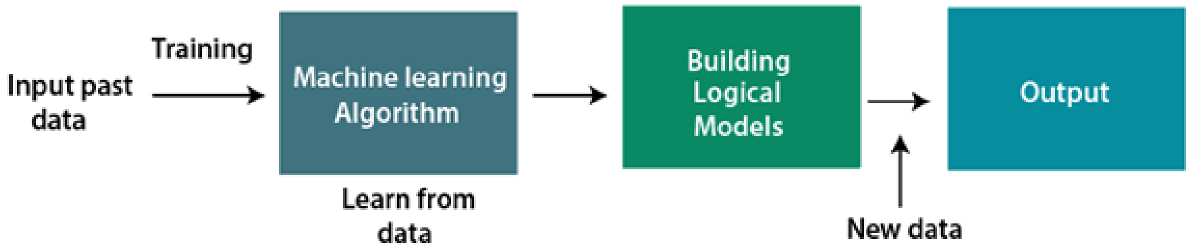

Applications of Machine learning
Automatic Language Translation
Medical Diagnosis
Stock Market trading
Online Fraud Detection
Virtual Personal Assistant
Email Spam and Malware Filtering
Self driving cars
Product recommend -ations
Traffic Prediction
Speech Recognition
Image Recognition

Explain above points according to your convinence

Reference link :- https://www.javatpoint.com/applications-of-machine-learning

How does Machine Learning Works :-

- A Machine Learning system **learns from historical data, builds the prediction models, and whenever it receives new data, predicts the output for it**.
- The accuracy of predicted output depends upon the amount of data, as the huge amount of data helps to build a better model which predicts the output more accurately.
- Suppose we have a complex problem, where we need to perform some predictions, so instead of writing a code for it, we just need to feed the data to generic algorithms, and with the help of these algorithms, machine builds the logic as per the data and predict the output.



Applications of ML in CybreSecurity :-

- Identifying the Cyber Threats
- AI-Based Antivirus Software
- Combating AI Threats
- Monitoring Emails
- To Analyse Mobile Endpoints

Explain above given points according to your convinence

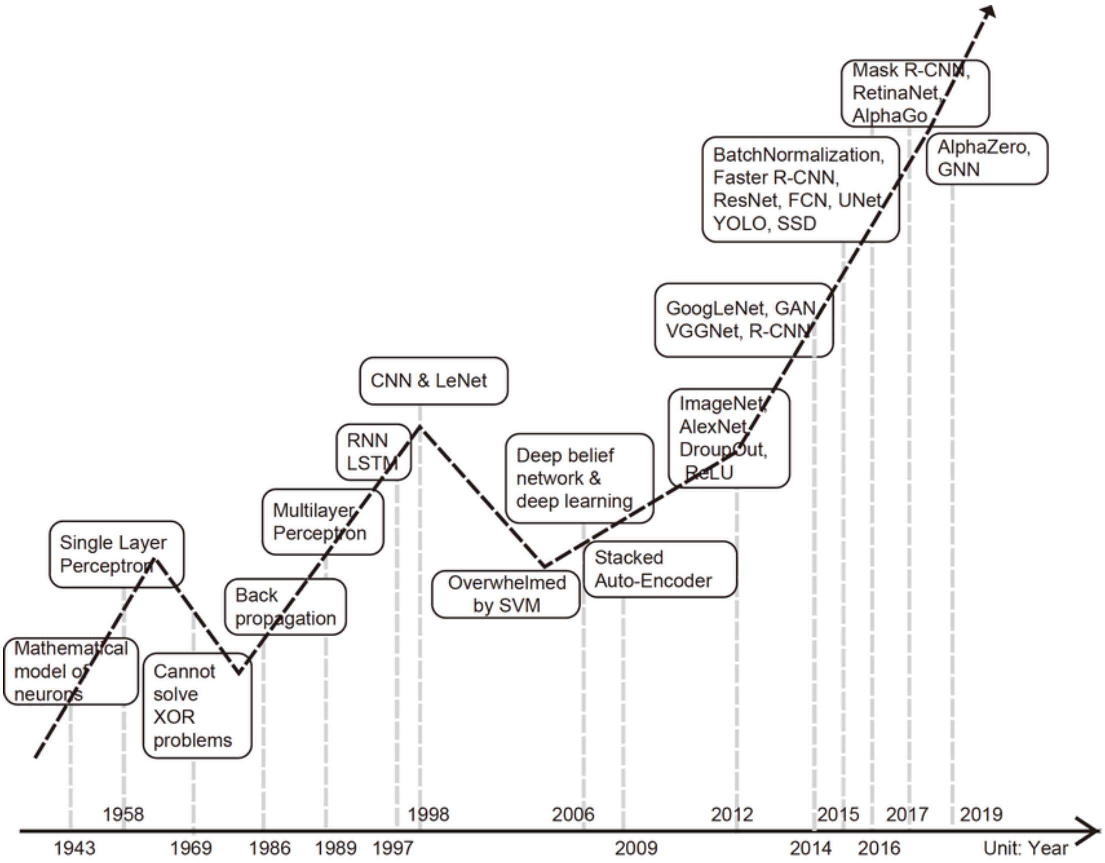
Reference link:- https://www.analyticsinsight.net/top-10-applications-of-machine-learning-in-cybersecurity/

DEEP LEARNING: -

What is Deep learning: -

- Deep learning is **a subset of machine learning that uses artificial neural networks to learn and improve on its own by examining computer algorithms**.

History of DL: -



Mathematical model of neurons
Single Layer Perceptron
Cannot solve XOR problems
Back propagation
Multilayer Perceptron
RNN LSTM
CNN & LeNet
Overwhelmed by SVM
Deep belief network & deep learning
Stacked Auto-Encoder
ImageNet, AlexNet, DroupOut, ReLU
GoogLeNet, GAN, VGGNet, R-CNN
BatchNormalization, Faster R-CNN, ResNet, FCN, UNet, YOLO, SSD
Mask R-CNN, RetinaNet, AlphaGo
AlphaZero, GNN
1943
1958
1969
1986
1989
1997
1998
2006
2009
2012
2014
2015
2016
2017
2019
Unit: Year

ONLY Approaches of ML & DL are reaminig soon will be updated