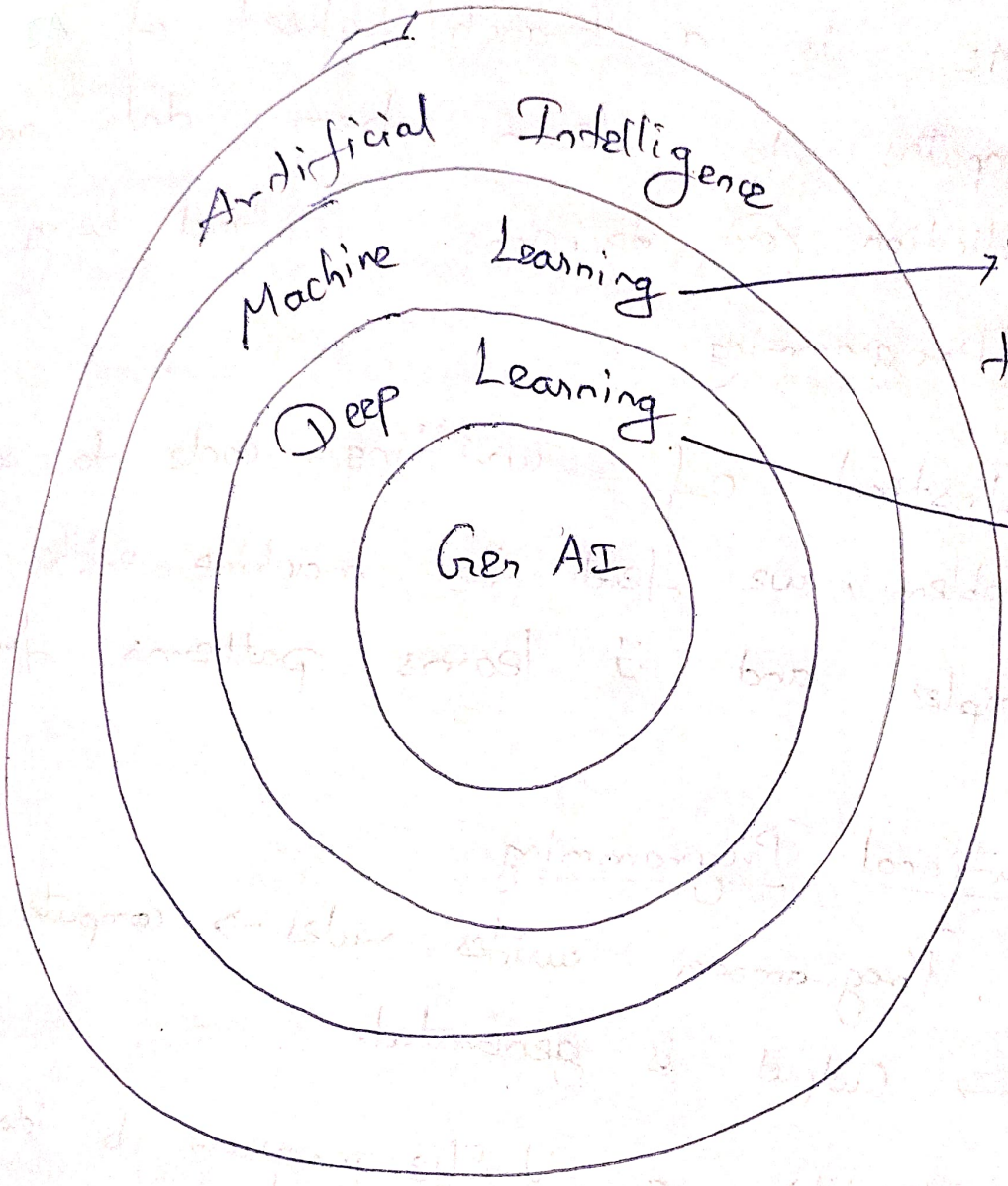
11/2025



In Research

- Quant AI
- Explainable AI

What is Machine Learning:- (ML)

ML is a branch / Subset of AI that enables computers to learn from data and make prediction (or) decisions without being explicitly Programming.

Instead of writting code to solve a specific problem, we feed the machine with data and Examples and it learns patterns from them

Eg: Traditional Programming

Programmer writes rules → computer applies them → Output is generated.

Eg: Writing an if-Else program to identify wheather an Email is spam.

Machine Learning :-

We give the computer thousands of Emails labled spam or not spam →

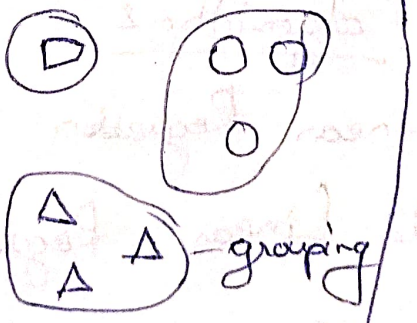
The computer Learns the rules automatically

→ It predicts if a new email is a spam.

Key Components of Machine Learning:-

1) Data: The information the machine learns from
2) Features: Input variables used to make prediction.
3) Model: The algorithm that learns from data.
4) Training: The process of teaching the model using data.
5) Prediction: Using the trained model on new unseen data.

Types of Machine Learning

Supervised Learning	Unsupervised Learning	Reinforcement Learning
Labeled Data □ - square ○ - circle △ - triangle	Unlabled  grouping	Deep learning

Supervised Learning

Regression

- if prediction point is continuous we use regression

Eg: Mpg, BMI

Classification

- If prediction Point is categorical / classes we use classification

Eg: Yes/No, True/False

Unsupervised Learning

↓

Clustering

Algorithms

Pure Regression algorithms

1) Simple Linear Regression
2) Multi Linear Regression
3) Polynomial Regression
4) Lasso and Ridge Regression

Pure Classification Algorithms:-

1) Logistic Regression
2) KNN (K-nearest neighbours)
3) Naive Bayes (Probability based)

Both regression and classification

1) Decision Tree < Regressor / Classifier

2) SVM (Support Vector Machine)

Ensumble techniques < Regressor / Classifier

1) Bagging
   - Random forest
2) ~~Gradient~~
3) Boosting
   -
   -
   -
   -
4) Stacking