

[Machine Learning]

- ① Linear Regression, Logistic Regression, Support Vector Machine, Random Forest → Tree based, Naive Bayes → Conditional Probs.

② Fixed function

eg: Linear regression = $y = mx + c$

Logistic Regression = $\frac{1}{1 + e^{-(mx + c)}}$

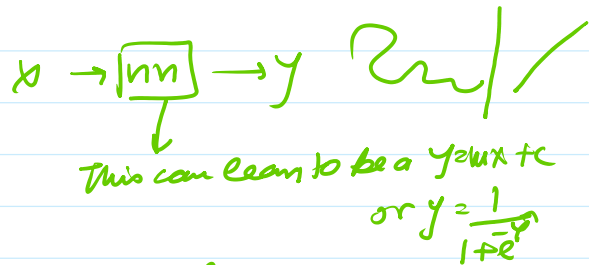
Learned

→ low complexity & low learning capacity.

[Deep Learning]

- ① Fully Connected neural network, Convolution neural network (Best Only encoder part of Transformer), LSTM, Transformers. GPT (Only decoder part of Transformer)

- ② Universal approximation function (This can take any slope) → Non-linear



- ③ deep → because of multiple hidden layers. high complexity & learning capacity

ML Tasks // Regression

→ Supervised
→ outputs a continuous number.

eg: House cost prediction

x_1	x_2	y
num. room	Area	\$ value

② Sales forecasting.

Regression algo metric -

name	\hat{y}	y	metric
	\$300	\$350	RMSE
	\$450	\$425	
			MSE

Classification

→ Supervised
→ Segregating i/p to categories.

- Eg:
- ① → i/p
Fruit A → apple
Fruit B → orange
 - ② → Sentiment classification
 - ③ → Spam vs Ham emails

Classification

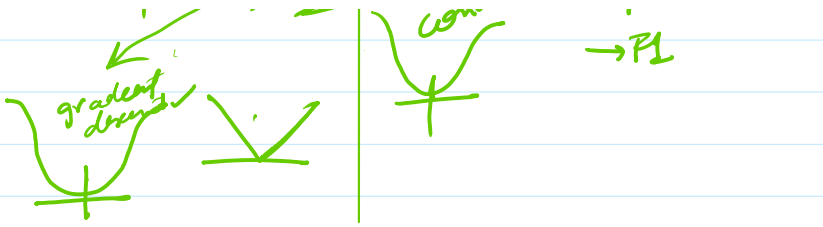
loss fn	Metrics
Cross Entropy loss	→ Accuracy → Precision → Recall → F1

Clustering

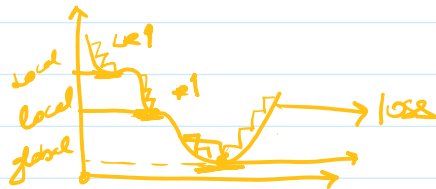
→ Unsupervised
→ Categories are not known
→ create similar groups of i/p data.
eg: → Customer segmentation based on their shopping history.

→ K-means

→ k means
→ elbow method to find best value of k .



local vs global minima (Loss function) (DL-concept)



Cross Entropy

LR shoot Karake