15/3/24

01 MAY'23 MONDAY

18th Week • 121-244

Machine Learning :-

MAY 202

SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI
	1	2	3	4	5	6	7	8	9	10	11	12
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									

09.00 Data → Big data → Data Analytics → Data science

(insight) (prediction)

10.00

11.00 Data

12.00 structured | unstructured

Row × column (table) | voice, text, img, vdo

13.00 DL

14.00 ML

15.00 Structured

16.00 numerical → discrete / continuous

categorical → ordinal / nominal

17.00

18.00

Data → Data science (Data + math) → ML (structured)

→ DL (unstructured)

ML → algorithms

① Supervised
- linear regression
- logistic regression
- SVM (Support vector Regression)
- naive bayes
- Decision tree Regression
- Random Forest Regression
- Boosting Regression

② Unsupervised
- K-means
- Hierchanical
- DB SCAN

JUNE 2023

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY'23
TUESDAY
18th Week • 122-243

02

DL — Artificial neural network (ANN)
- CNN
- RNN
- GAN

(computer vision) → CNN

NLP → RNN

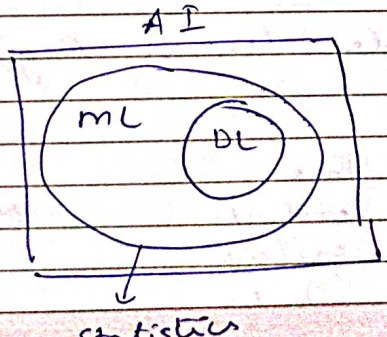
Artificial neural networks ⇒ structure data

CNN ⇒ Image, video
- image classification
- obj detection
- obj segmentation
- obj tracking
- OCR

RNN ⇒ text, voice
- sentiment analysis,
- text classification,
- text generation,
- text summarization

Artificial Intelligence :-

Machines having the intelligence like humans.



03 MAY'23 WEDNESDAY
18th Week • 123-242

MAY 20

SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI
	1	2	3	4	5	6	7	8	9	10	11	12
14	15	16	17	18	19	20	21	22	23	24	25	26
28	29	30	31									

09.00
10.00
11.00
12.00
13.00
14.00
15.00
16.00
17.00
18.00

Supervised ML

Regression → numerical data
- linear reg
- Support vector reg
- Decision Tree reg
- Random forest reg
- XBR, GBR, ABR
- KNN for Reg.

Classification → categorical data
- logistic Reg
- SVM (SVC)
- DT classifier
- RFC
- XBC, GBC, ABC
- KNN for classifier
- naive Bayes classifier.

Ex:- Height (independent) weight BMI (dependent) } Regression
numerical type.

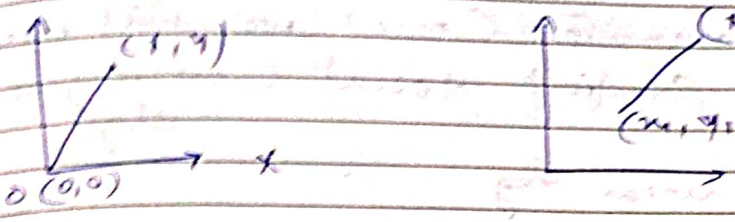
Height (independent) weight Gender (dependent) } classifier.

Regression (simple linear Reg)

no. of Rooms	House size	price
2	1600 sqft	50 lakhs
3	1400 sqft	80 lakhs
4	1800 sqft	1 Cr

We can predict price with two independent columns no of rooms & house size.
So it is a reg problem.

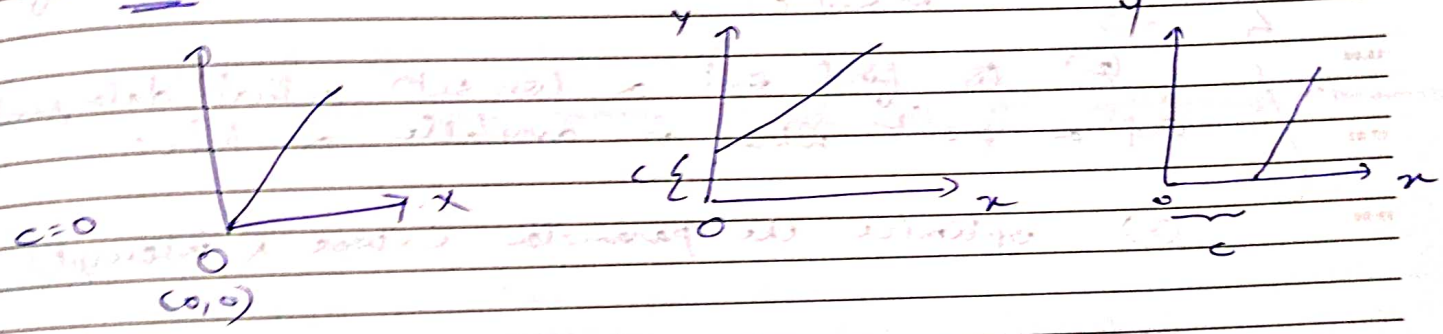
Most of the things we worry about, never happen.



line eqn ⇒ ① slope (m) $y = mx + c$
② intercept (c)

slope (m) = (ratio) $\frac{y}{x}$

Intercept

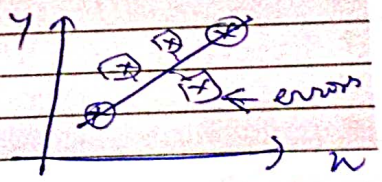


① standard form of line $Ax + By = c$
② slope & intercept form $y = mx + c$
③ point & slope form $y - y_1 = m(x - x_1)$

Simple linear Regression → one independent & dependent column

our motive :- to find the best fit line

① draw a line
② find out error (loss)
③ adjust the parameter (m, c)



05 MAY'23 FRIDAY

18th Week • 125-240

To adjust the parameter (m, c) we will use an algo called Gradient decent (convergence algo)

$y = mx + c$ - simple linear reg.

$h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3 + \cdots \theta_n x_n$

↑ multiple linear reg.

steps :-

1. draw a line (with random initialization of m and c)
2. find out a loss between actual data point and a point which is available on line.
3. optimize the parameter (slope & intercept)

Types of loss function or cost fun

1. mean square Error
2. mean absolute Error
3. Root mean square Error
4. Huber Loss
5. quantile loss

JUNE 2023

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MAY'23
SATURDAY
18th Week • 126-239

06

Gradient Decent Algo

→ compute the partial derivative of cost fun wrt weight and intercept.

↓ (m)

↓ (c)

update the weight

$$\text{new weight} = \text{old weight} - \alpha \frac{\partial \text{loss}}{\partial m}$$

$$\text{new intercept} = \text{old intercept} - \alpha \frac{\partial \text{loss}}{\partial c}$$

Repeat the steps until you find the minimum ~~pts~~ loss or optimized parameter.