

Machine Learning

Types of ML

- ① Supervised ML
- ② Unsupervised ML
- ③ Reinforcement ML

* Supervised ML

X_1	X_2	X_3	X_4	Y
Age	Salary	Education	Job	Loan
21	30K	708	Gov.	Y
25	45K	620	Rd.	N
30	60K	750	Govt	30L.
—	—	—	—	15L.

→ Labeled data
 → classification
 → Regression

Types of Supervised ML

- ① Regression
- ② classification

Regression

- ① Linear Reg.
- ② KNN Reg.
- ③ SVR
- ④ DTR
- ⑤ RFR
- ⑥ Ada boost Reg.
- ⑦ Gradient boost Reg.
- ⑧ XGBoost Reg.
- ⑨ Polynomial Reg.

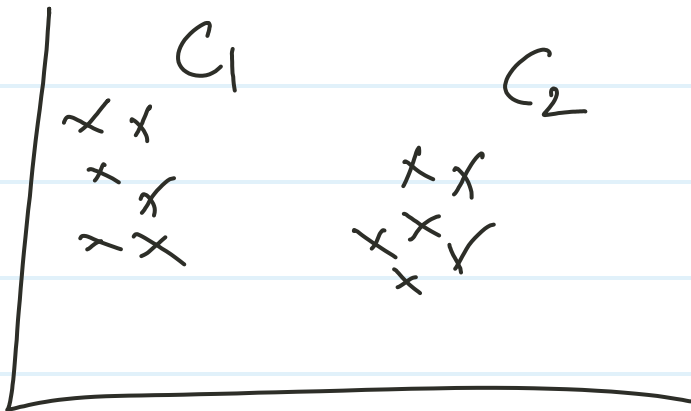
classification

- ① Logistic Reg.
- ② KNN clas.
- ③ SVC
- ④ DTC
- ⑤ RFC
- ⑥ Ada boost clas.
- ⑦ Gradient boost clas.
- ⑧ xgboost class
- ⑨ Naive bay's clas.

unsupervised ML

X_1	X_2	X_3	X_4
S_1	Math	2018	A
S_2	chem	2019	C
S_3	Phy	2020	B

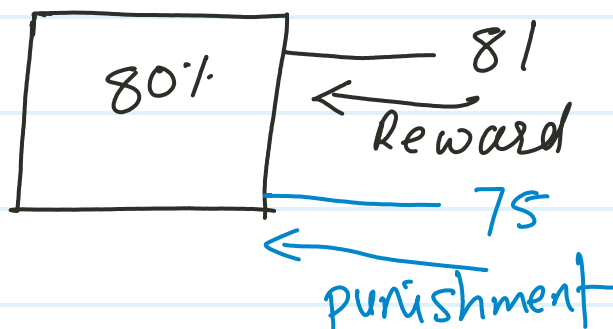
— unlabeled
Data



- ① k-means clustering
- ② k-means + t
- ③ Hierarchical clustering
- ④ DBSCAN
- ⑤ PCA
- ⑥ priori

Reinforcement ML.

Supervised and unsupervised



- ① Q-learning
- ② SARSA (state-Action-Reward-state-Action)
- ③ PRO (Proximal Policy Optimization) and TRPO (Trust Region Policy optimization)
- ④ A2C (Advantage Actor - Critic)
- ⑤ DDPG (Deep Deterministic policy Gradient)

* Regression Algorithms

Linear Regression -

Correlation -

eco growth
(GDP)

share market capitalization
(Nifty)

4.3 Trillion

20k

4.5 T

22k

5. T

25k

6. T

30k

8 T

40k

9 T

50k

X ↑ ↓ (+)

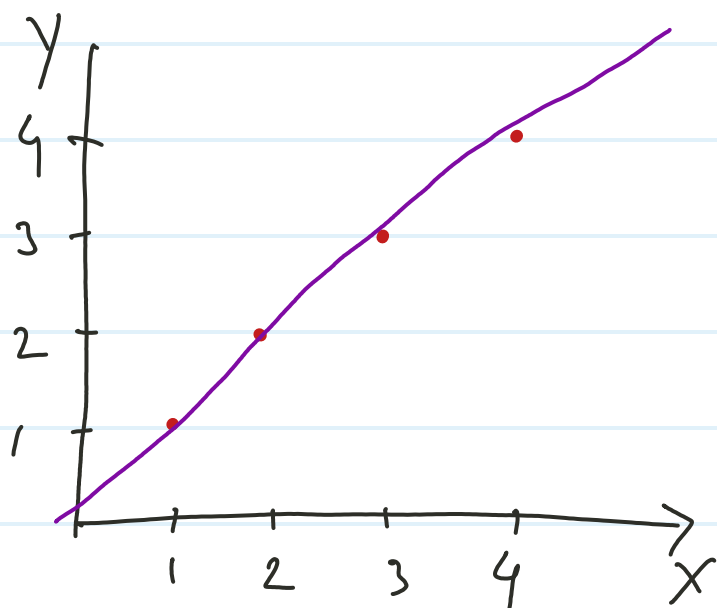
Y ↑ ↓

X ↑ (-)

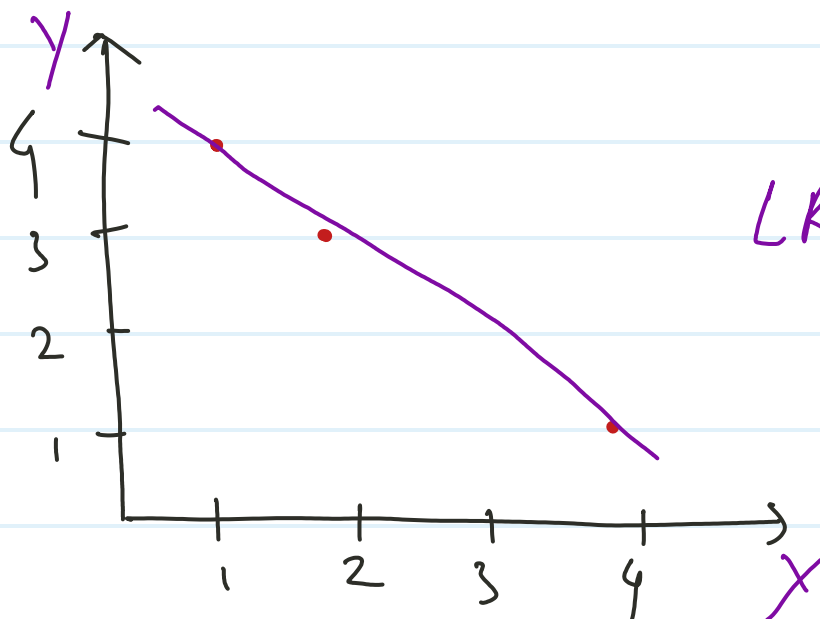
Y ↓

X ↑ (0)

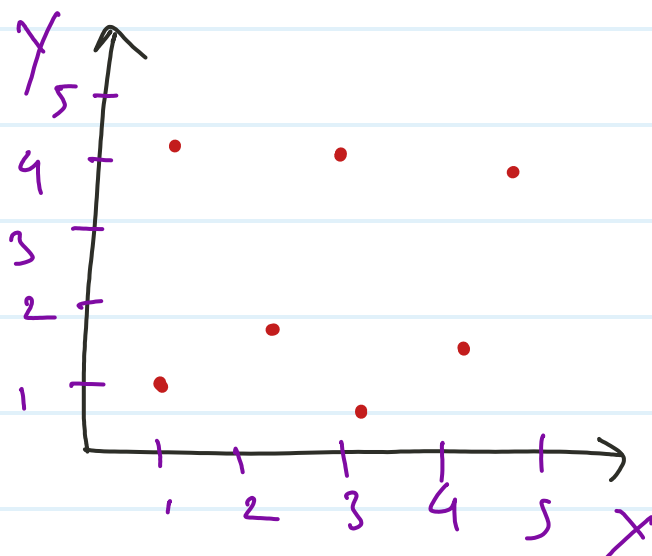
Y



LR



LR



Zero

line eqn $y = mx + c$

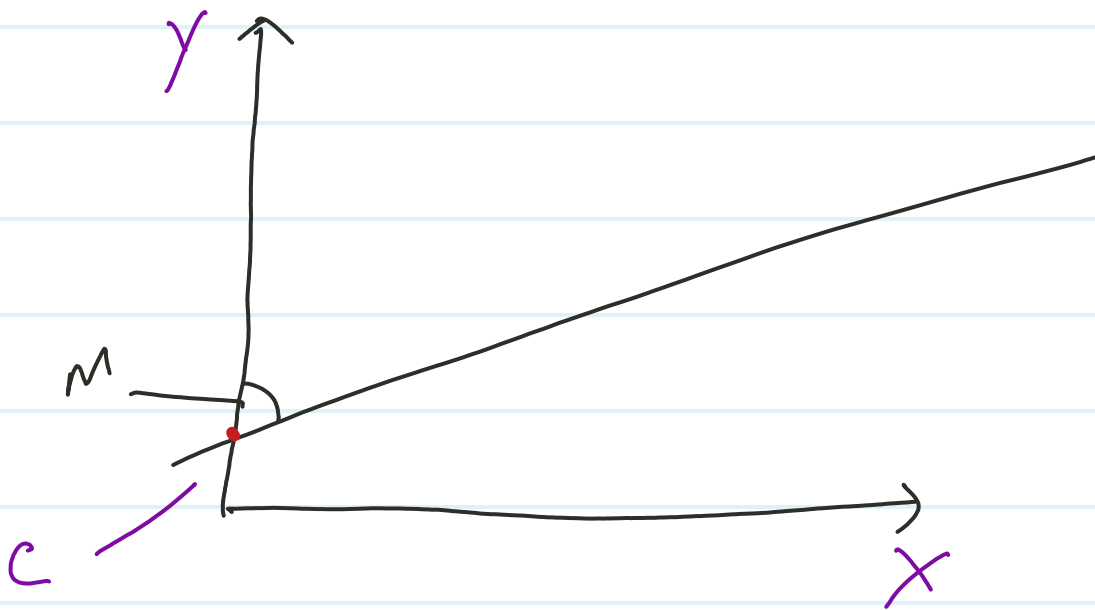
$$\theta_i = \theta_0 \theta_1 + \theta_0$$

$$h_{\theta} = h_{\theta_1} + \theta_0$$

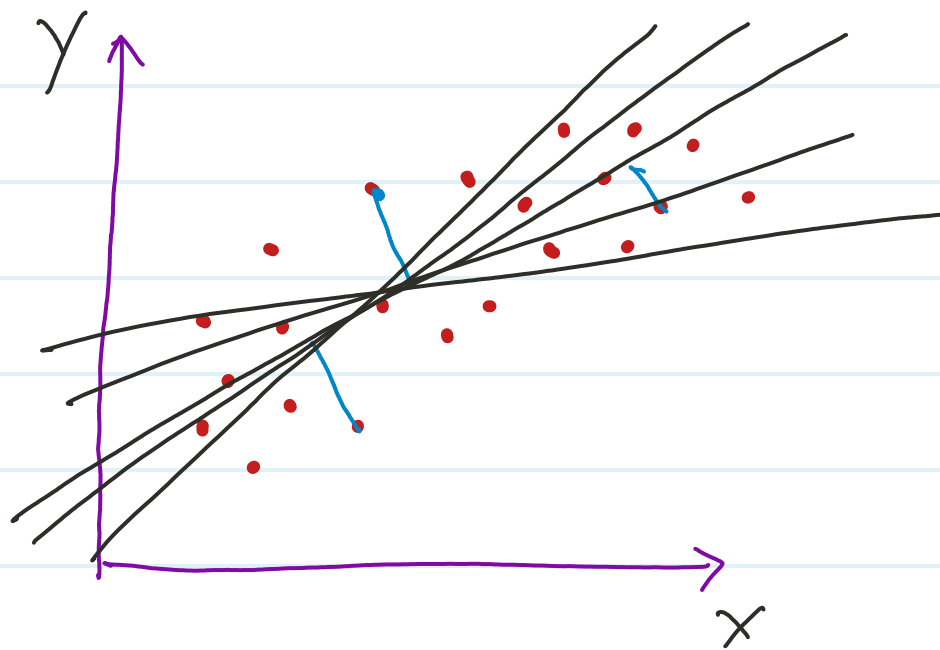
$$m = \text{slop}$$

$$x = \text{Independent variable}$$

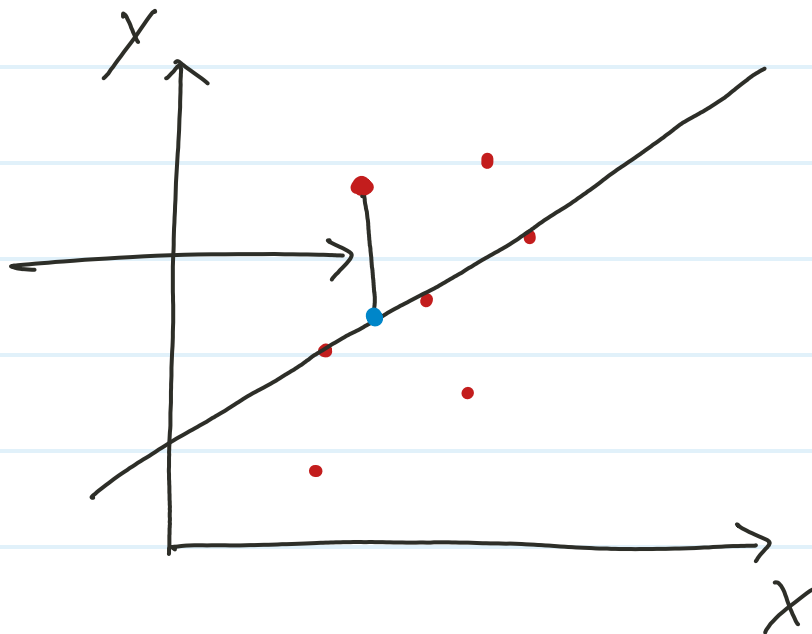
$$c = \text{Intercept}$$



$$y = mx + c$$



Residual
erro



- - Actual datapoint y
- - Predicted data point \hat{y}

$$y - \hat{y} =$$

$$h_{\theta} = \theta_0 + h_{\theta,1}x_1 \quad \text{Simple linear.}$$

$$y = c + mx$$

$$y = c + m_1x_1 + m_2x_2 + m_3x_3 + \dots + m_nx_n$$

$$h_\theta = \theta_0 + h_{\theta,1}x_1 + h_{\theta,2}x_2 + \dots + h_{\theta,n}x_n$$