Feature Engineering

(i) Transformation

Techniques

(i) Normalization
(ii) standerdization
(iii) Log Transformation
(iv) Robust scaler
(v) Max Absolute Scaler

Cost	transform_cost
100	0.33
200	0.66
150	0.50
300	1.00

100 → 0.33 করা Scaling আর Scaling করলে range কমে বড় হলো transformation

[Scaling is a part of Transformation]

(i) Normalization => or MinMaxScaler

$$X_{new} = \frac{X_i - Min(X)}{Max(X) - Min(X)}$$

(i)

	Salary	MMS	
	50	1	← New1
	20	0	← New2

$$X_{new_1} = \frac{50 - 20}{30} = \frac{30}{30} = 1$$

$$X_{new_2} = \frac{20 - 20}{30} = 0$$

(ii) Standerdization or StanderdScaler or ZScore

=> standerd scaler

$$X_{new} = \frac{X_1 - X_{mean}}{\text{Standard Deviation}}$$

Salary
50
20

$$\text{mean} = \frac{70}{2} = 35$$

$$X_{new} = \frac{50 - 35}{\text{standard Di}}$$

$$\text{Standard Deviation} = \sqrt{\frac{(50-35)^2 + (20-35)^2}{2}}$$

$$= \sqrt{\frac{225+225}{2}}$$

$$= \sqrt{\frac{450}{2}} = \sqrt{225}$$

$$= 15$$

$$X_{new_{50}} = \frac{50-35}{15} = \frac{15}{15} = 1$$

$$X_{new_{20}} = \frac{20-35}{15} = \frac{-15}{15} = -1$$

Salary	
50	1
20	-1

Max Absolute Scaler

Formula = $x_{Scaled} = \frac{x}{Max(x)}$

Salary
50
20

$$x_1 = \frac{50}{50} = 1$$

$$x_2 = \frac{20}{50} = 0.4$$

Salary	trans
50	1
20	0.4