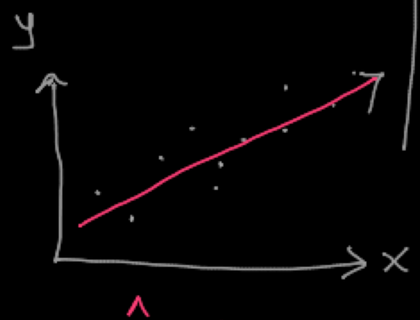
Multiple x-value ← Multi linear Regression → Continuous 'y'

x	y



$\hat{y} = \beta_0 + \beta_1 x$.

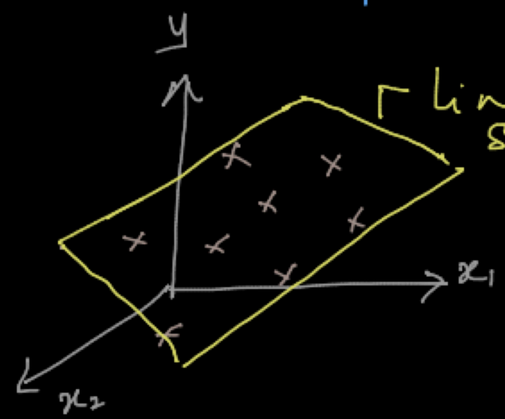
→ Eqn of a st. line.

x_1	x_2	y

$\hat{y} = \beta_0 + \beta_1 x_1 + \beta_2 x_2$

— linear eqn.

— Eqn of a plane.



← d-dimensional data →

x_1	x_2	x_3	...	x_d	y

$\hat{y} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_d x_d$

→ linear eqn

→ linear surface.

→ Hyperplane.

$\hat{y} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_d x_d$.

→ linear Eqn

Assumptions:

1. Assumption on the parameters.

$$\hat{y} = \beta_0 + \beta_1 x_1 + \beta_2 x_2^2 + \cdots$$

2. Residuals ⇐

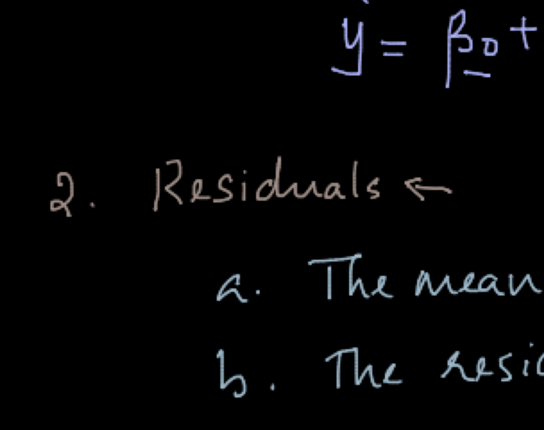
a. The mean should be Zero.

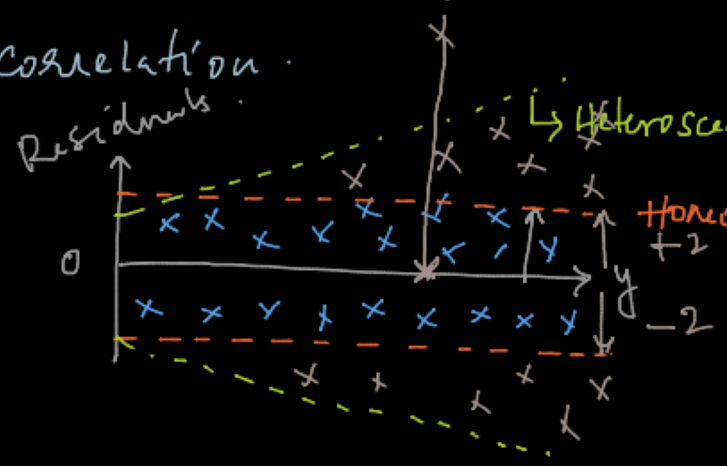
b. The residuals should be ND (random)

c. There should be Constant Variance.

(Homoscedasticity)

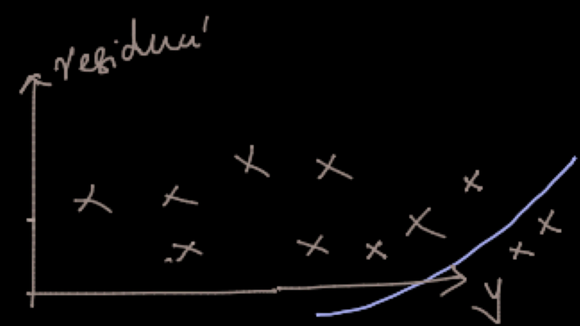
d. No autocorrelation.

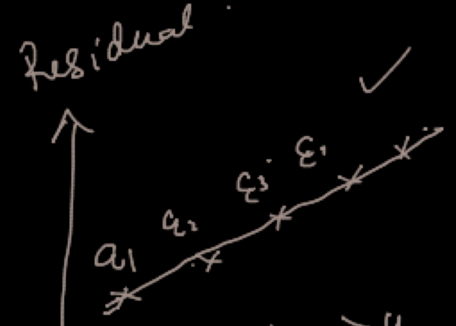


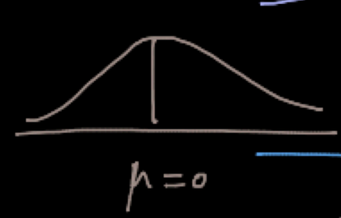


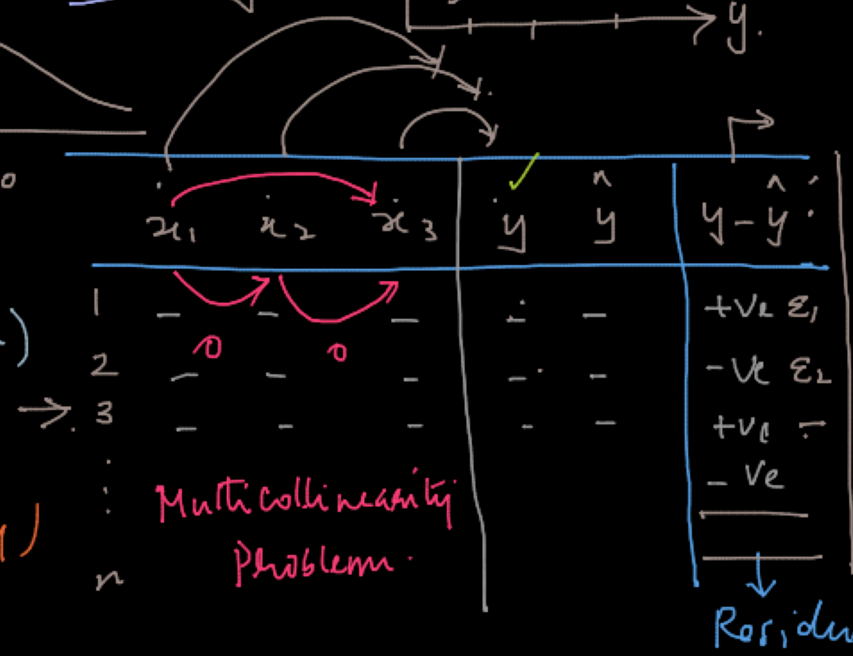
3. Independent Variables

— the X-values should be independent of each other









± 2L

x	y

Errors

ε_1
ε_2
ε_3

x	y	$\hat{y}$	Error
1200	53	55	−2
1500	75	80	−5
1800	86	100	−14

y	$\hat{y}$	Error
53	55	−2
75	73	+2
86	87	−1
93	94	−1
		−2

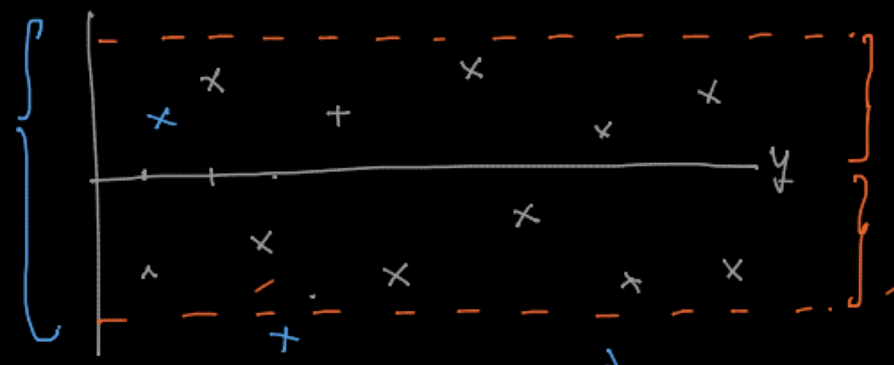
→ 2 Cr.

+2.6

−2.5

Heteroscedasticity

Errors



± 2 lakhs