SIMPLE LINEAR REGRESSION

→ Objective

1. To establish relationship b/w two variables

Eg: $x \propto y$ or $x \propto \frac{1}{y}$

2. Forecast new observations

Eg: what will be sales for next quarter

→ Variables → Independent (x)

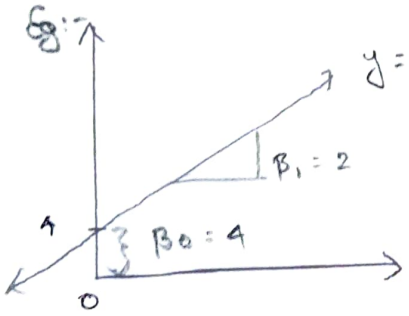
↘ Dependent (y)

→ $y = a + bx$ or $y = mx + b$ } $y = \beta_0 + \beta_1 x$

β_1 : slope

β_0 : intercept

Eg:



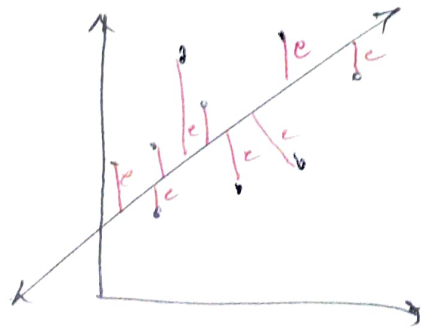
$y = 4 + 2x$ → Intercept ⇒ $y(x=0) = 4 = \beta_0$

Slope ⇒ coeff $x = 2 = \beta_1$

SIMPLE LINEAR REGRESSION MODEL

$$y = \beta_0 + \beta_1 x + \varepsilon$$

ε → error



$\varepsilon = \sum_{i=1}^{n} e^2$. Such that ε is minimum

MULTIPLE REGRESSION MODEL

$$y = m_1 x_1 + m_2 x_2 + m_3 x_3 + \cdots + m_n x_n + c$$

f_1 f_2

Multiple regression is Linear regression with more features 'f'.