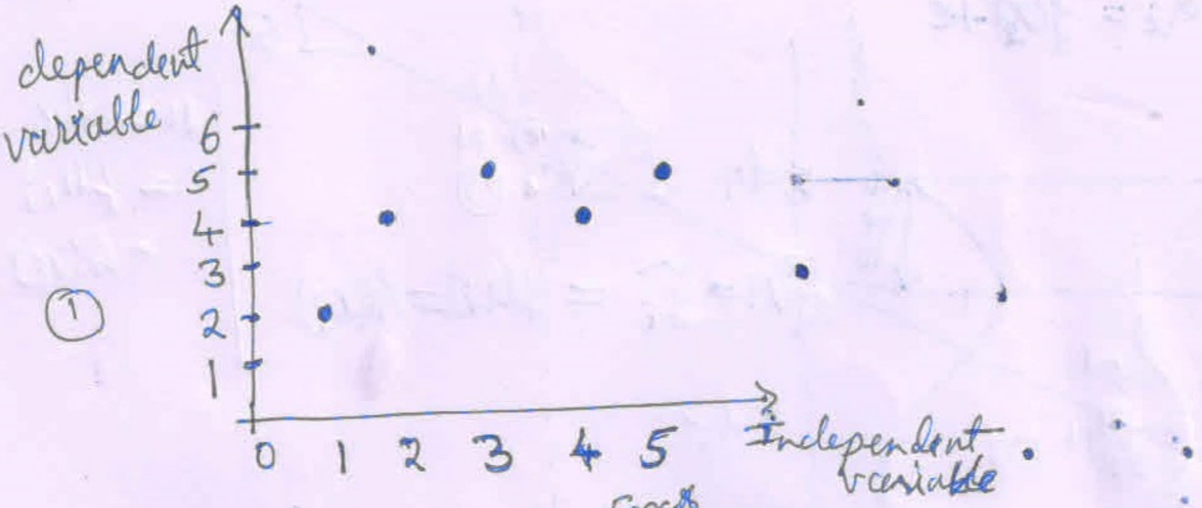
(1)



(2)

x	y	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})^2$	$(x-\bar{x})(y-\bar{y})$
1	2	$1-3=-2$	$2-4=-2$	4	4
2	4	$2-3=-1$	$4-4=0$	1	0
3	5	$3-3=0$	$5-4=1$	0	0
4	4	$4-3=1$	$4-4=0$	1	0
5	5	$5-3=2$	$5-4=1$	4	2
$\bar{x}=3$ mean of x	$\bar{y}=4$ mean of y			$\Sigma=10$	$\Sigma=6$

Error

$\therefore$ Slope

$$b_1 = \frac{\Sigma(x-\bar{x})(y-\bar{y})}{\Sigma(x-\bar{x})^2}$$

$$\boxed{b_1 = \frac{6}{10} = 0.6}$$

(3) Regression line pass through the point (3,4)

$\hat{y} = b_0 + b_1 x$

$4 = b_0 + 0.6(3)$

$b_0 = 4 - 1.8$

$\boxed{b_0 = 2.2}$

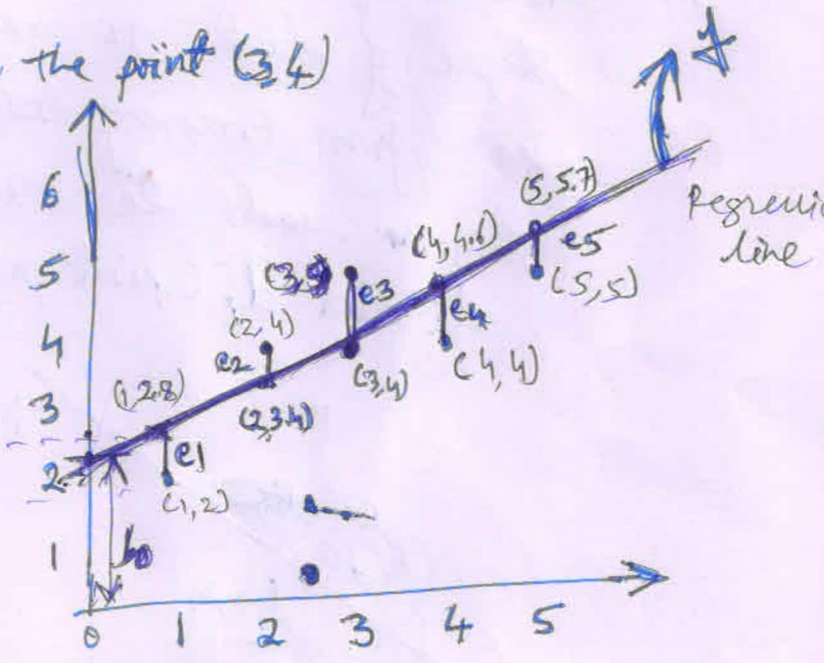
(4) $\therefore x=1,\ y = 2.2 + 0.6*1 = 2.8$

$x=2,\ y = 2.2 + 0.6*2 = 3.4$

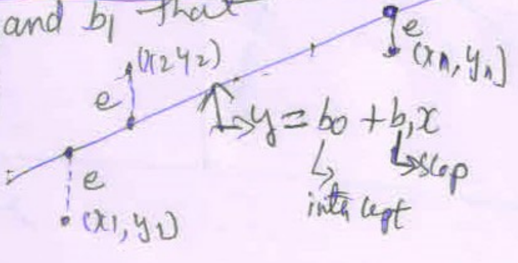
$x=3,\ y = 2.2 + 0.6*3 = 4.0$

$x=4,\ y = 2.2 + 0.6*4 = 4.6$

$x=5,\ y = 2.2 + 0.6*5 = 5.7$



find b_0 and b_1 that minimizes squared error



~~Error~~ at each point

~~$y_1 - (b_0+$~~

$y_1 - (b_0 + b_1 x_1)$ e1

slice

$y_2 - (b_0 + b_1 x_2)$

$\vdots$

$y_n - (b_0 + b_1 x_n)$

e1

$\therefore$ Squared error

$(y_1 - (b_0 + b_1 x_1))^2 +$

$(y_2 - (b_0 + b_1 x_2))^2 +$

$\vdots$

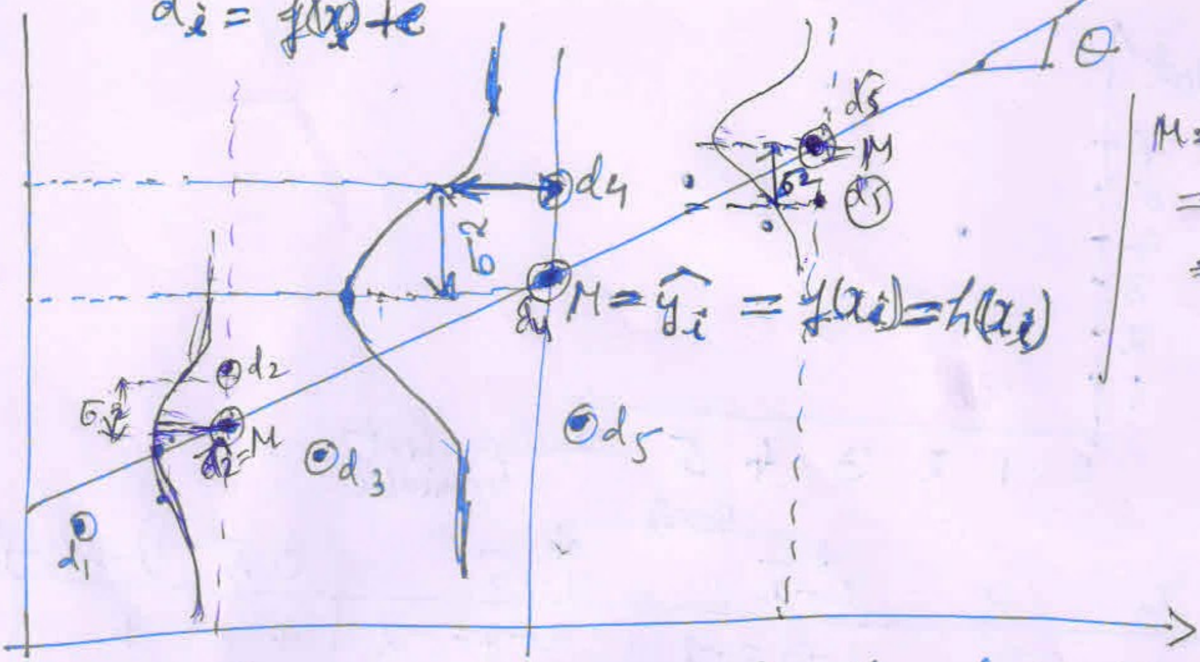
$(y_n - (b_0 + b_1 x_n))^2$

$d_i = f(x) + e$

Consider.

$d_i = y_i$

$\hat{d}_i = \hat{y}$



$M = b_0 + b_1 x$
$= f(x_i)$
$= h(x_i)$

* Each point is assumed to be Normally distributed and ~~we~~ on line ⟶ product of $p(d_i|h)$ for each d_i is done.

* The process of maximizing ~~the~~ height of bar from given training example and the curve

* Linear regression is here is to change the slope of line to maximize the height of bar from training example and the curve. This leads to minimizing distance b/w d_i and $\hat{d}_i$ (point on line)