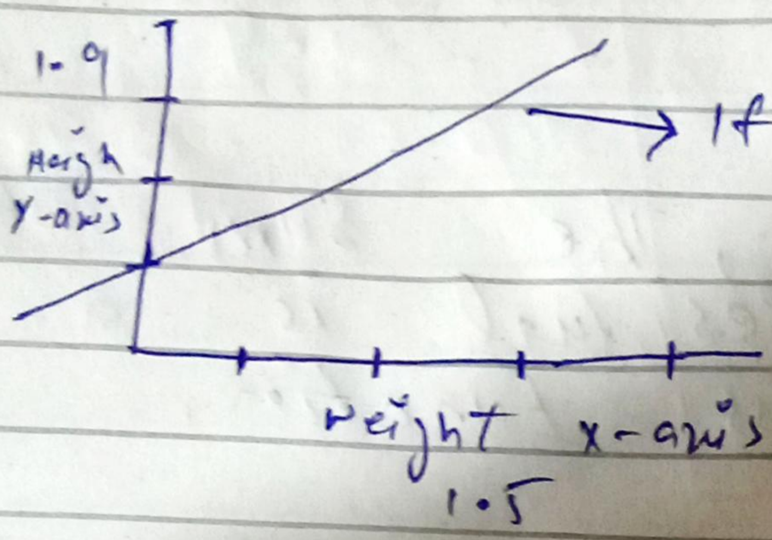
Gradient Descent



→ If we fit a line to the data.

Predicted = intercept + slope x Weight

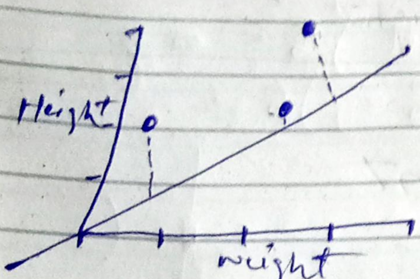
learn how Gradient Descent can fit a line to data by finding the optimal value for the intercept and the slope.

the Least Squares estimate for the slope, 0.64

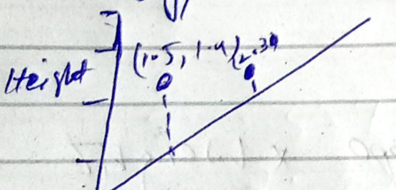
picked random value for the intercept

we case use 0, but any no will do

$0 + 0.64 \times \text{weight}$

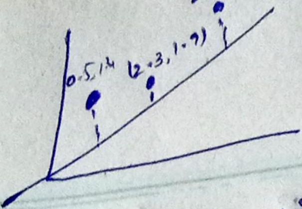


In ML lingo, The sum of The squared Residual is a type of Loss Function.



Predict Height $= 0 + 0.64 \times 0.5$
$= 0.32$

we calculate the difference between 1.4 & the observed Height

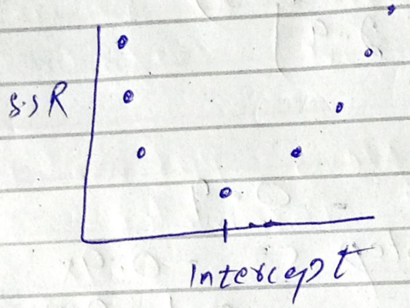


Residual = 1.4 - 0.32 = 1.1

The sum of the squared Residual.

$$(1.1)^2 + (0.4)^2 + (1.3)^2 = 3.1$$

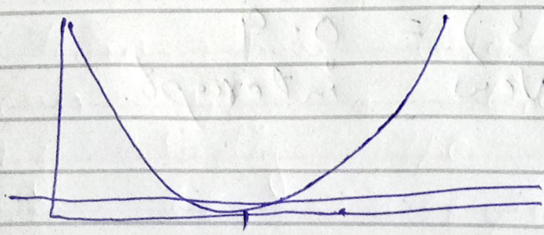
3.1 is the sum of the squared Residuals.



Finding optimal values.

Predicted Height = Intercept + 0.64 x w

$$S.SR = (1.4 - (\text{inte} + 0.64 \times 0.5)^2 + (1.4(\text{inte} + 0.64 \times 2.3)^2) + (3.2 - (\text{Inte} + 0.64 \times 2.9)^2)$$

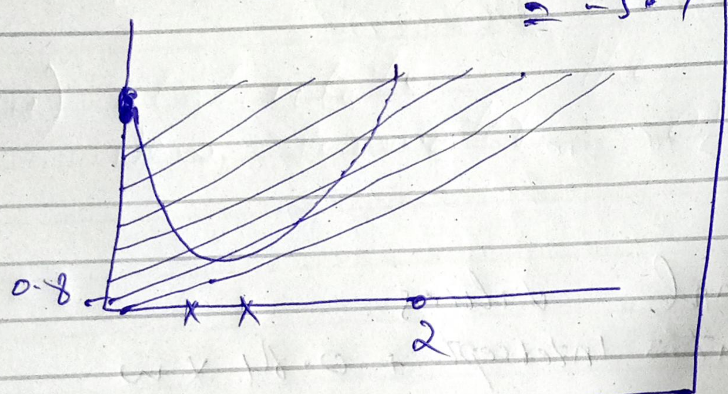


$$\frac{d}{d\,inte} \text{ sum of SR} = \frac{d}{d\,inte}\left(1.4-(int + 0.64 \times 0.5)\right)^2$$

$$+\frac{d}{d\,inte}\left(1.9-(inte+0.64\times 2.3)\right)^2$$

$$+\frac{d}{d\,inte}\left(3.2-(inte+0.64\times 2.9)\right)^2$$

$$= -2\left(1.4-(int+0.64\times 0.5)\right)$$
$$-2\left(1.9-(int+0.64\times 2.3)\right)$$
$$-2\left(3.2-(int+0.64\times 2.9)\right)$$
$$= -5.7$$



-0.9

step $s = -0.9 \times 0.1 = 0.04$

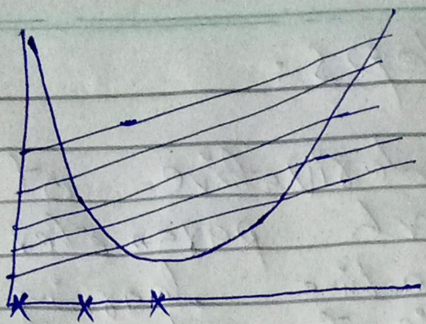
$= -5.7 \times 0.1 = 0.57$

$= 2.3 \times 0.1 = -0.23$

$= 0.57 - (-0.23) = 0.9$

New intercept

0.89

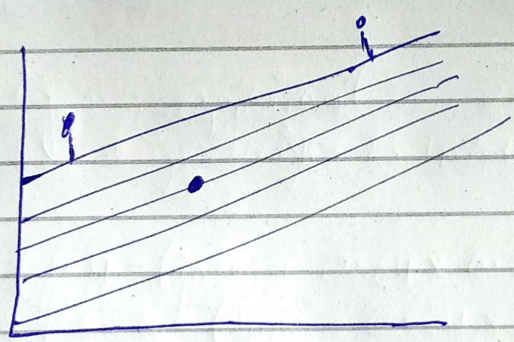


0 ← 0.7 0.8 0.9

The last step = 0.9
very close to 0

~~step~~ = 0009 x 0.9 = 0.0009

Maximum step of gradient
more then 1000
gradient will stops



Repeat untill all step closed
to + 0 and Each
Maximum No - of - step.

All steps:

1) Take the derivative of the Loss - f for each parameter in it fancy Machine learning Lingo the Gradient of the loss function.

2) Pick random value for the parameters.

3) plug the parameter value into the derivative Gradient

4) Calculate the New parameters
New parameter = old parameter - step