$$\frac{}{\partial b_{12}} = 1$$

steps (once again)

0) weights/bias → init $\quad$ random $\quad$ $W = 1$ $\quad$ $b = 0$

loop - 100/100

1) for i in range(4):

	cgpa	iq	lpa	$\hat{y}$
	8	80	8	$\to 8$
	6	60	6	
	7	70	7	
	9	90	9	

multiple change

9 trainable

iq • $\xrightarrow{W}$ b

cgpa •

$-\hat{y}$

$(y - \hat{y})^2$

1a) 1 student → forward prop → predict (lpa) → $\qquad$ 2 min

7b) Loss calculate (mse) → .

1c) Adjust all weights and bias $\vec{}$.

$$-- \quad 4D \quad --$$

$$W_{new} = W_{old} - \eta \left\{ \frac{\partial L}{\partial W_{old}} \right\}$$

→ 9 times
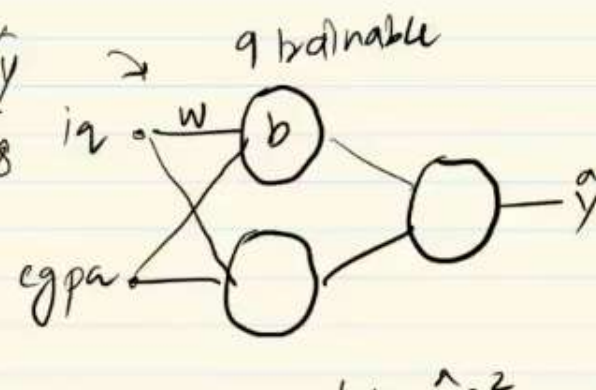
Back propagation Algorithm

$epochs = 5 \rightarrow (5)$

```
for i in range(epochs):

        for j in range(X.shape[0]):

            →  Select 1 row (random)

            →  Predict ( using forward prop)

            →  Calculate loss (using loss function → mse)

            →  Update weights and bias using GD
```

$$W_n = W_0 - \eta \frac{\partial L}{\partial W}$$

→ Calculate avg loss for the epoch

$$\frac{\partial L}{\partial w_{11}^2} = -2(y-\hat{y})O_{11}$$

$$\frac{\partial L}{\partial w_{21}^2} = -2(y-\hat{y})O_{12}$$

$$\frac{\partial L}{\partial b_{21}} = -2(y-\hat{y})$$

$$\frac{\partial L}{\partial w_{11}'} = -2(y-\hat{y})\, w_{11}^2 x_{11}$$

$$\frac{\partial L}{\partial w_{21}'} = -2(y-\hat{y})\, w_{11}^2 x_{12}$$

$$\frac{\partial L}{\partial b_{11}} = -2(y-\hat{y})\, w_{11}^2$$

$$\frac{\partial L}{\partial w_{12}'} = -2(y-\hat{y})\, w_{21}^2 x_{11}$$