

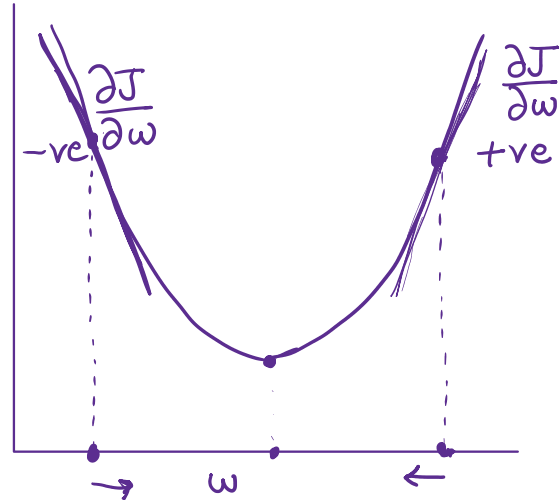
$\frac{dy}{dx}$: derivative $\frac{\partial y}{\partial x}$: Partial derivative

Steps :-

1. Assume random values for the weights $(-1, 1)$ [Initialization]
2. Calculate the weighted sum J
3. Calculate its activation
4. Calculate its error
5. If $\text{error} < \text{tol}(0.0001)$ then Keep weights as they are else update the weights with formula :-

$$\text{new wt} = \text{old wt} - \eta \frac{\partial J(w)}{\partial w}$$

$J(w)$: loss function
 $\frac{\partial J}{\partial w}$: Gradient
 η : Learning rate $(0, 1)$
6. Repeat steps 2 to 5 till sufficiently error is minimized



$$f(x, y, z) = x^2 + 2yz + 3x^2y$$

$$\frac{\partial f}{\partial x} = 2x + 0 + 6xy, \quad \frac{\partial f}{\partial y} = 0 + 2z + 3x^2$$

$$\frac{\partial f}{\partial z} = 2y$$