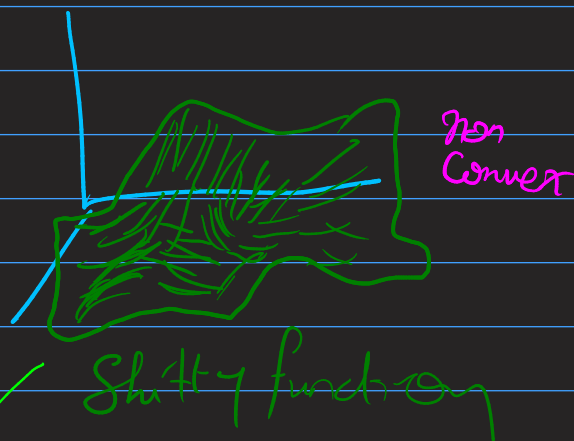
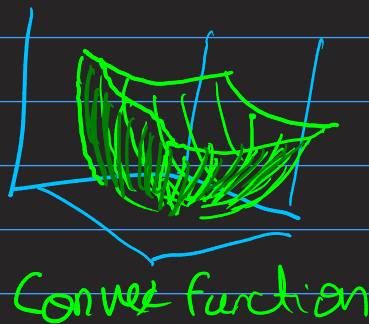


$$\frac{1}{2} \min \sum_{n=1}^N ((\omega_0 + \omega, x_n) - t_n)^2$$

$$E(\omega_0, \omega) = \frac{1}{2} \sum_{n=1}^N ((\omega_0 + \omega, x_n) - t_n)^2$$



→ When do we say that a function is convex

→ We cannot talk about global minima easily

$$\left. \frac{dE}{dx} \right|_{x=x^*} = 0$$

$$f(x_1, x_2, x_3) = 2x_1^2 + 30x_2 + 5x_3^2 + 6x_2 + 7x_3^2$$

$$f(x) = 5x^2 + 2x + 3$$

$$f'(x) = 10x + 2$$

$$f''(x) = 10$$

$$\nabla f = \begin{bmatrix} \frac{\partial f}{\partial x_1} \\ \frac{\partial f}{\partial x_2} \\ \frac{\partial f}{\partial x_3} \end{bmatrix} = \begin{bmatrix} 4x_1 + 3x_2 \\ 3x_1 + 6 \\ 24x_3 \end{bmatrix}$$

$$\text{Hessian} = \begin{bmatrix} \frac{\partial^2 f}{\partial x_1^2} & \frac{\partial^2 f}{\partial x_1 \partial x_2} & \frac{\partial^2 f}{\partial x_1 \partial x_3} \\ \frac{\partial^2 f}{\partial x_2 \partial x_1} & \frac{\partial^2 f}{\partial x_2^2} & \frac{\partial^2 f}{\partial x_2 \partial x_3} \\ \frac{\partial^2 f}{\partial x_3 \partial x_1} & \frac{\partial^2 f}{\partial x_3 \partial x_2} & \frac{\partial^2 f}{\partial x_3^2} \end{bmatrix}$$

Find out the Eigenvalues of This

if they are all +ve

we can say that the error function is convex

→ End of T,

→ Obj/fill/subjective or combination

→ google form exam

→ Crmeet@10am (ipp-wkac-zja)