Data Science: Theory and Practice

LAB - 9

1) Is the search direction a gradient descent one?

$J(w) = (w_1-10)^2 + (w_2-10)^2$.

Initial point - (2,1)

$\frac{\partial J}{\partial w_1} = 2(w_1-10) = 0$; $\frac{\partial J}{\partial w_2} = 2(w_2-10) = 0$

$2w_1 - 20 = 0$

$w_1 = 20/2$

$\boxed{w_1 = 10}$

$2w_2 - 20 = 0$

$2w_2 = 20$

$w_2 = 20/2$

$\boxed{w_2 = 10}$

Initial pt (2,1)

in $\partial J/\partial w_1$; $\partial J/\partial w_2$

$\partial J/\partial w_1 = 2(w_1-10)$

$= 2(2-10)$

$= -16$

$\partial J/\partial w_2 = 2(w_2-10)$

$= 2(-9)$

$= -18$.

Steepest Gradient direction $= -\begin{bmatrix} -16 \\ -18 \end{bmatrix} = \begin{bmatrix} 16 \\ 18 \end{bmatrix}$

But given is (2,5)

Thus, it is not a gradient Descent.