

Step-1

The least squares solution to a problem $ax = b$ in one unknown is $\hat{x} = \frac{a^T b}{a^T a}$

If $x = b_1, x = b_2$ are the observations and $w_1 > w_2$, then the weighted error $E^2 = w_1^2 (x - b_1)^2 + w_2^2 (x - b_2)^2$

The error is minimized at $\hat{x}_w = \frac{w_1^2 b_1 + w_2^2 b_2}{w_1^2 + w_2^2}$

If w_1 approaches to zero, then it becomes $\hat{x}_w = \frac{w_2^2 b_2}{w_2^2}$
 $= b_2$

So, even if the observation $x = b_1$ is totally unreliable, we get the weighted average \hat{x}_w is equal to observation $x = b_2$.