**Proof of Error of Estimate**

The Linear regression model is given by:

** (1)**

The equation of the fitted line is given by:

 **(2)**

By definition the Residual formula is given as:

 **(3)**

We substitute (2) in (3)

This implies that:

 **(4)**

Remember that:



And so



This implies that:

 **(5)**

Also remember that:



This proves that:

 **(6)**

***QED***