Partial (sequential) F tests for nested models

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \quad (1)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \quad (2)$$

addition

Model (1) is "nested" inside model (2)

(contained in or is a subset of)

Similarly the null model (mean model)

$$Y = \beta_0 + \varepsilon \quad (0)$$

is nested inside the SLR model

$$Y = \beta_0 + \beta_1 X + \varepsilon \quad (1)$$

addition

So, the overall F test for a SLR model was a special case of a partial or sequential F test

A partial F is a test for part of a model

→ the addition of some extra terms

So a partial F test for the addition of $\beta_2 X_2$ to a model that already contains $\beta_0 + \beta_1 X_1$,

$$F = \frac{\sigma^2_{addition}}{\sigma^2_{error}}$$

← for the larger model ie model (2)