Suppose that there are roups and there are samples in the th group. So the observed data is of the form: , where and . For each group, we don’t know the actual . Instead, we know 3 pieces of info: the group size , the group mean and the group SD: . Let .

First, we calculate the grand mean:

Next, we calculate SSB and SSW:

Finally, the F-statistic is calculated as:

Degree-of-freeman for numerator =   
Degree-of-freeman for denominator =   
Finally p value = , where represent a random variable that follow a F-distribution with df = .