*Session 5: Assignment 3*

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1. Introduction

This assignment will help you to consolidate the concepts learnt in the session.

1. Problem Statement

**Problem Statement 1:**

Calculate F Test for given 10, 20, 30, 40, 50 and 5,10,15, 20, 25.

For 10, 20, 30, 40, 50:

**Note: Solution submitted via github must contain all the detailed steps.**

**3. Output:**

Step 1: Calculate **Variance of first set**: Total Inputs (N) = (10,20,30,40,50) = **5**

Mean (xm)= (x1+x1+x2...xn)/N = 150/5 = **30**

SD =sqrt(1/(N-1)x((x1-xm)2+(x2-xm)2+..+(xn-xm)2))

=> sqrt(1/(5-1)((10-30)2+(20-30)2+(30-30)2+(40-30)2+(50-30)2))

=> sqrt(1/4((-20)2+(-10)2+(0)2+(10)2+(20)2))

=> sqrt(1/4((400)+(100)+(0)+(100)+(400)))=> sqrt(250)= **15.81**

Variance=SD2= 15.81x15.81= **250**

Step 2: Calculate **Variance of 2nd set**: Total Inputs (N2) = (5, 10,15,20,25) = **5**

Mean (xm2)= (x1+x1+x2...xn)/N2 = 75/5 = **15**

SD =sqrt(1/(N2-1)x((x1-xm2)2+(x2-xm2)2+..+(xn-xm2)2))

=> sqrt(1/(5-1)((5-15)2+(10-15)2+(15-15)2+(20-15)2+(25-15)2))

=> sqrt(1/4((-10)2+(-5)2+(0)2+(5)2+(10)2))

=> sqrt(1/4((100)+(25)+(0)+(25)+(100)))=> sqrt(62.5)= **7.90**

Variance=SD2= 7.90x7.90 = **62.5**

Step 3: Calculate **F Test**:

F Test = (variance of 10, 20,30,40,50) / (variance of 5, 10, 15, 20, 25) = 250/62.5 = 4

**Therefore, the F Test value is 4.**