

Practical Sessions: Series 3

■ Exercise 1:

We want to test whether two populations have the same variance.

A company measures the weight variability of two machines:

Machine	Observations
A	12.3, 11.7, 12.9, 12.5, 11.9, 12.8
B	10.2, 9.8, 10.4, 9.5, 10.0, 9.6

We want to test at $\alpha = 0.05$:

Solution for F-Test Exercise

Step 0: Input Data

A	B
Group 1	22
	25
	21
	23
	24
	26
	22
	25
	24
	23
Group 2	30
	28
	29
	31
	32
	30
	27
	29

(Place Group 1 in A2:A11, Group 2 in B2:B9)

Step 1: Compute Sample Means

C

D

Mean Group 1 =AVERAGE (A2:A11)

Mean Group 2 =AVERAGE (B2:B9)

Step 2: Compute Sample Variances

C

D

Variance Group 1 =VAR.S (A2:A11)

Variance Group 2 =VAR.S (B2:B9)

Step 3: Compute F Statistic

C

D

F observed =MAX (D2, D3) /MIN (D2, D3)

(Where D2 = Variance Group 1, D3 = Variance Group 2)

Step 4: Determine Critical Value

C

D

df1 =COUNT (A2:A11) -1

df2 =COUNT (B2:B9) -1

F critical (two-tailed, $\alpha=0.05$) =F.INV.RT (0.025, D5, D6)

Step 5: Make Decision

C

D

Decision =IF (D4 > D7, "Reject H0", "Do NOT reject H0")

(D4 = F observed, D7 = F critical)

Step 6: Optional – Conclusion

C

D

Conclusion =IF (D8="Do NOT reject H0", "Variances are statistically equal", "Variances are different")

