Anova : One factor Anova

SSC → Sum of Squares b/w the samples

SSE → Sum of squares w/in the samples.

MSC → Mean Sum of Squares

MSE → Mean Sum of Sq.. with in the samples

Source of variation	Sum of Sq.	Degree of freedom	Mean Sum of Sq.	F
B/w the samples	SSC	$V_1 = c-1$	$MSC = \frac{SSC}{V_1}$	$F = \frac{MSC}{MSE}$
w/in the samples	SSE	$V_2 = n-c$	$MSE = \frac{SSE}{V_2}$	

One factor Anova : 2P. →

$$SSC = \frac{A^2}{N_A} + \frac{B^2}{N_B} + \frac{C^2}{N_C} + \frac{D^2}{N_D} - \frac{T^2}{N}$$

2 factor ANOVA

Correction factor

eg:

Days	A	B	C	D
M	3	4	4	5
T	4	5	8	7
W	6	7	8	9

N = 3 * 4 = 12

Mid = 8.5 ≈ 5

① Variance b/w the col

	A	B	C	D	Total
M	-2	-1	-1	0	-4
T	-1	0	3	2	4
W	+1	2	3	4	10
Total	-2	1	5	6	10

① correction factor = $\frac{T^2}{N} \Rightarrow \frac{(10)^2}{12} \Rightarrow \frac{100}{T_2} = 8.3$

② $SSC \Rightarrow \frac{(-2)^2}{3} + \frac{(+1)^2}{3} + \frac{(5)^2}{3} + \frac{(6)^2}{3} - 8.3 \Rightarrow$

$\Rightarrow \frac{4}{3} + \frac{1}{3} + \frac{25}{3} + \frac{36}{3} - 8.3 \Rightarrow \boxed{13.7}$

③ $SSR \Rightarrow \frac{(-4)^2}{4} + \frac{(4)^2}{4} + \frac{(10)^2}{4} - \frac{T^2}{N} \Rightarrow$

$\Rightarrow \frac{16}{4} + \frac{16}{4} + \frac{100}{4} - 8.3 \Rightarrow$ 33 − 8.3 ⇒ 24.7

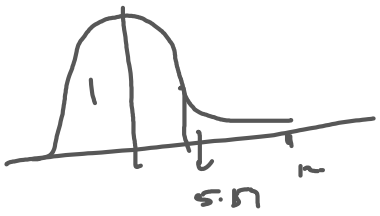
Source of variation	Sum of Squares	Degrees of freedom	Mean Sum of Squares	F
B/o the columns	SSC 13.7	$V_1 = c-1 = 3$	$MSC = \frac{SSC}{V_1}$ $\frac{13.7}{3} = 4.5$	$\frac{MSC}{MSE}$ $= 4.5$
B/o the rows	SSR 24.7	$V_2 = r-1 = 2$	$MSR = \frac{SSR}{V_2}$ $\frac{24.7}{2} = 12.35$	$\frac{MSR}{MSE}$ $= 12.35$
Residual Error	SSE 8.6	$V = (c-1)(r-1) = 6$	$MSE = \frac{SSE}{V}$ $\frac{8.6}{6}$	
	SST (47)	$V = n-1$		

Tab $E_{r,3} = 4.76$

$C_{1,2} = 5.14$ → null hypothesis rejected

$SSE = SST - (SSC + SSR) \Rightarrow 47 - (38.4) \Rightarrow 8.6$

$SST \Rightarrow (-2)^2 + (-1)^2 + (-1)^2 + (0)^2 + (-1)^2 + (0)^2 + (3)^2 + (2)^2 + (1)^2 + 2^2 + 3^2 + 4^2 - \frac{T^2}{N}$



$\Rightarrow 4+1+1+0+1+0+9+4+1+4+9+16$

$SST = 47$