90623 - 95123

Analysis of Variance

20, 0, 1
1, 5, 15
10, 10, 1
21, 0, 0

a + b + c = 21

21 + 3 - 1 C 3 - 1

⇒ 23 C 2

a, b, c ≥ 0

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a + b + c = 3
3, 0, 0
1, 2, 0
1, 1, 0

Obs + no of var - 1 C var - 1

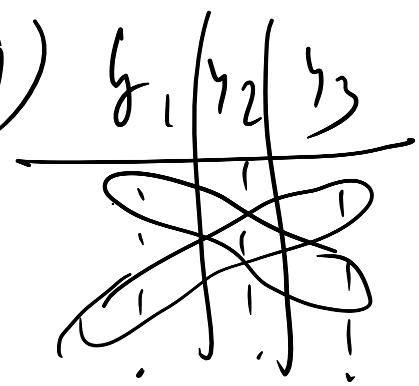
⇒ 3 + 3 - 1 C 3 - 1 ⇒ 5 C 2

⇒ 10

TSS = ESS + RSS

$y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + \epsilon$

$y = x^2 + 7x + 9$



$F = \frac{MSB}{MSE}$

H_0 ✓

H_1 ✓

Special Recording session very soon..

$y = 2x + 7$

$y = \alpha x^2 + \beta$

$y = \alpha x^{7/3} + \beta$

Why ANOVA

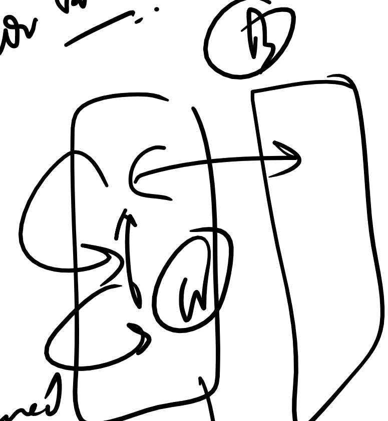
$y = (\alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \beta_4)$

Interrelation b/w variables

4 types of ANOVA

- 1 way
- 2 way
- Factorial → mean of 2/more for controlling the effect on other variables..
- Repeated Measures → Same group diff times

$TSS = SSB + SSW$



Source of Variation	df	SS	MS	F observed
Between	K-1	$SSB = \sum n(\bar{y}_i - \bar{y})^2$	$\frac{SSB}{K-1}$	$F = \frac{MSB}{MSE}$
[illegible]	N-K	$SSE = \sum\sum(y_{ij} - \bar{y}_i)^2$	$\frac{SSE}{N-K}$	

Between	K-1	SSB = ...	SSB/(K-1)	F	MSB/MSE
Within	n-K	$SSE = \sum\sum (y_{ij} - \bar{y}_i)^2$	SSE/(n-K)		

What is df??

5 equations

$a+b+c = 15$
$a+b = 10$
$b = 5$
$c = 10$
$d = 12.5$
12.5
5 eqn - 5 var

Correction factor = $\frac{n}{n}$

As every variable behaves in a different way so we can't use mean
So we use the system.

finally here we use

Fill in the blanks (ANOVA)

	df	SS	MS	F_0	F_{table} 3.10
Factor	K-1 = 4-1 = 3	2940	2940/3 = 980		
Within group	24-4 = 20	3272	3272/20 = 163.6		
Total	23	6212			

4 types of

4 types of Fertilizers @ random to (6) plots.

Total	23	69.12

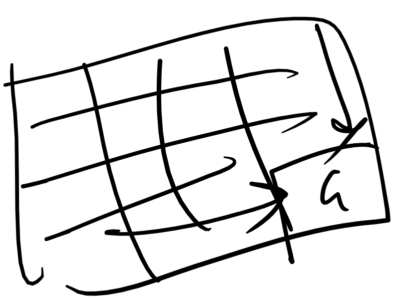
$f_0 = \frac{980}{163.6} = 5.99$

2 way Anova

For replicated / randomized design

Source of variation	Df	SS
Between level of factor A	$k-1$	$SSA = l\sum(\bar{y}_{i0}-\bar{y}_{00})^2$
factor B	$(l-1)$	$SSB = k\sum(\bar{y}_{0j}-\bar{y}_{00})^2$
Error	$(k-1)(l-1)$	$MSE = \frac{SSE}{(k-1)(l-1)}$
Total	Total	

$f_0 = \frac{MSA}{MSE}$



$Cf = \frac{G^2}{N}$

G = Sum of Column of Column of Row of Rows

When to analyse a Data

When to analyse a data on the basis of mixtures?? $\sum$.

Big Data

Can't segregate..

what's the way out??

Start spend on Hypothesis testing on Econometrics Sessions...

Source of data
Full Structure of the Data
Utilisation of Data

Q. X_1, X_2, X_3, X_4 $N(\theta, 1)$ θ

$H_0: \theta = 1$ $H_1 = \theta < 1$ $\alpha = 0.05$

For what observed value of $\sum_{i=1}^{4} x_i$ the UMP test wrongly reject H_0??

$X_i \overset{iid}{\sim} N(\theta, 1)$ $i = 1, 2, 3, 4$

$\bar{X} \sim N(\theta, \frac{1}{4})$

$H_0 : \theta = 1$

$H_1 : \theta < 1$ One tailed test

$TS = \frac{\bar{X} - \mu}{\sigma/\sqrt{n}} \sim N(0,1)$

Reject H_0 when $TS < -1.64$

$TS = \frac{\bar{X} \sim \theta}{1/2} < -1.64$

$\frac{\frac{\sum x_i}{4} - 1}{0.5} < -1.64$

$\sum x_i < 0.72$

POF → Executive Summary