Analysis of 2^2-design:

Factorial expts. are conducted either in C.R.D or R.B.D or L.S.D. and thus they can be analysed in the usual manner except that in this case the treatment sum of square is split into three orthogonal components each with 1 d.f.

The sum of square due to the factorial effects A, B and AB is obtained by multiplying the squares of the factorial effects by a suitable quantity. Usually Tr. S.S is calculated by using yate's table.

Yate's Table

Treatment combination	Treatment total	[1]	[2]	$S.S = \frac{[2]^2}{r.2^2}$
[1]	(1) = 1	(1)+(2) = 5	5+6 = 9	$9^2/r.2^2$ (omitted) = G.
A	(A) = 2	(3)+(4) = 6	7+8 = 10	$10^2/r.2^2$
B	(B) = 3	(2)−(1) = 7	6−5 = 11	$11^2/r.2^2$
AB	(AB) = 4	(4)−(3) = 8	8−7 = 12	$12^2/r.2^2$

ANOVA Table

S.V	d.f	S.S	M.S.S	F-Ratio	F-table
Blocks (Replicates)	$r-1$	B.S.S	$a = \frac{B.S.S}{r-1}$	a/e	$F_{[r-1,\ 3(r-1)]}$ df
Treatment					
A	1	$S.S_A$	$b = S.S_A / 1$	b/e	$F_{[1,\ 3(r-1)]}$ df
B	1	$S.S_B$	$c = S.S_B / 1$	c/e	"
AB	1	$S.S_{AB}$	$d = S.S_{AB} / 1$	d/e	"
Error	$3(r-1)$	E.S.S	$e = ESS / 3(r-1)$		
Total	$n-1$	T.S.S			

Inference:

If the calculated value of F is less than the table value of F, H_0 is accepted, Otherwise it is rejected.