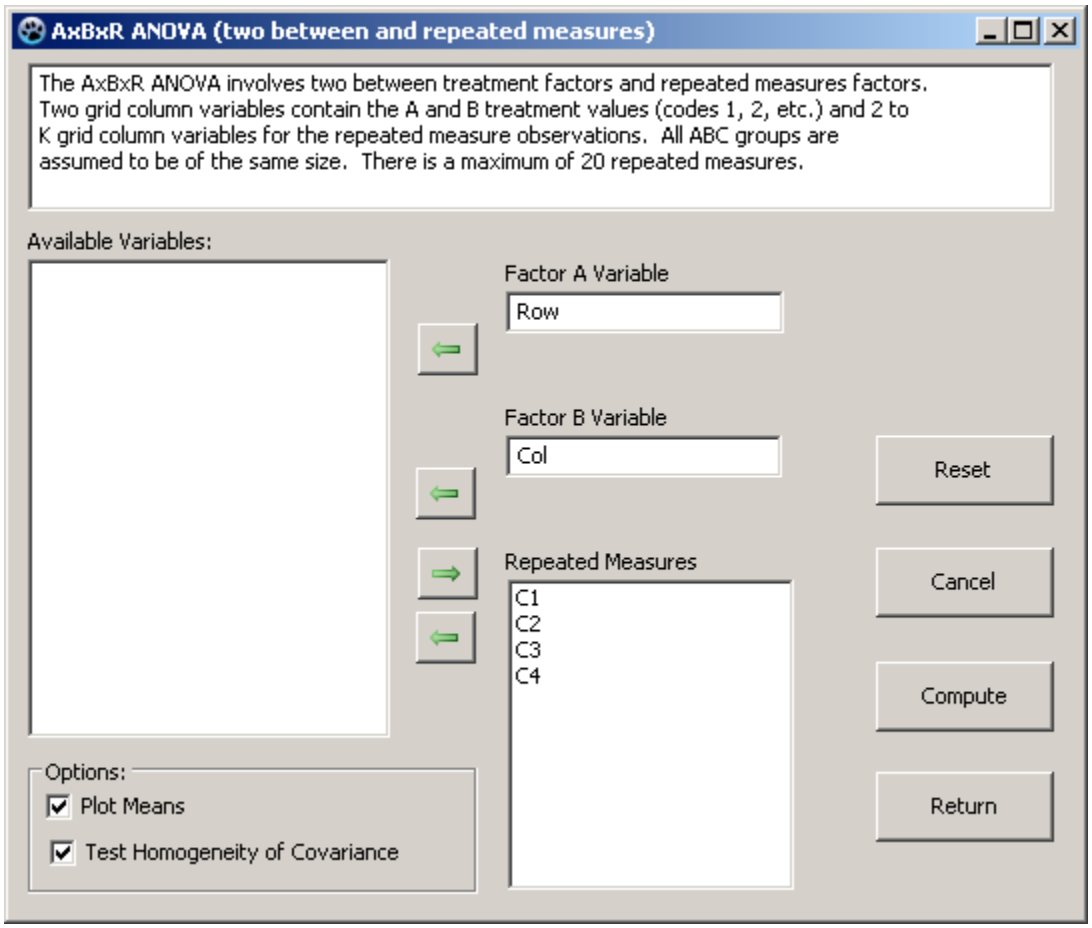
The A x B x S Analysis of Variance

Like the AxS "mixed" design ANOVA that had repeated measures for different levels of treatment for one independent variable, we can also combine a two-way ANOVA with repeated measures. We will demonstrate using the same data file as in the previous analysis, namely the ABRDATA.LAZ file.



When you click the Compute button you obtain:

SOURCE	DF	SS	MS	F	PROB.
Between Subjects	11	181.000			
A Effects	1	10.083	10.083	0.978	0.352
B Effects	1	8.333	8.333	0.808	0.395
AB Effects	1	80.083	80.083	7.766	0.024
Error Between	8	82.500	10.313		
Within Subjects	36	1077.000			
C Replications	3	991.500	330.500	152.051	0.000
AC Effects	3	8.417	2.806	1.291	0.300
BC Effects	3	12.167	4.056	1.866	0.162
ABC Effects	3	12.750	4.250	1.955	0.148
Error Within	24	52.167	2.174		
Total	47	1258.000			

ABR Means Table with 3 cases.

Variables

	C1	C2	C3	C4
A1 B1	17.000	12.000	8.667	4.000
A1 B2	15.333	10.000	7.000	2.333
A2 B1	16.667	10.000	6.000	2.333
A2 B2	17.000	14.000	9.333	8.333

AB Means Table with 12 cases.

Variables

	B 1	B 2
A1	10.417	8.667
A2	8.750	12.167

AC Means Table with 6 cases.

Variables

	C 0	C 1	C 2	C 3
A0	16.167	11.000	7.833	3.167
A1	16.833	12.000	7.667	5.333

BC Means Table with 6 cases.

Variables

	C 1	C 2	C 3	C 4
B1	16.833	11.000	7.333	3.167
B2	16.167	12.000	8.167	5.333

Variance-Covariance AMatrix for A1 B1 with 12 cases.

Variables

	C1	C2	C3	C4
C1	7.000	9.500	8.667	5.583
C2	4.000	10.000	10.083	6.667
C3	5.000	11.000	12.333	7.167
C4	4.000	11.000	10.667	8.167

Variance-Covariance AMatrix for A1 B2 with 12 cases.

Variables

	C1	C2	C3	C4
C1	9.333	8.750	4.333	2.125
C2	4.000	9.000	9.042	5.333
C3	0.000	9.500	13.167	7.583
C4	-0.667	7.500	9.333	6.417

Variance-Covariance AMatrix for A2 B1 with 12 cases.

Variables

	C1	C2	C3	C4
C1	1.333	2.375	0.167	-0.271
C2	-2.000	8.500	6.521	3.667
C3	-2.000	6.750	10.583	6.792
C4	-1.333	4.750	7.667	5.542

Variance-Covariance AMatrix for A2 B2 with 12 cases.

Variables

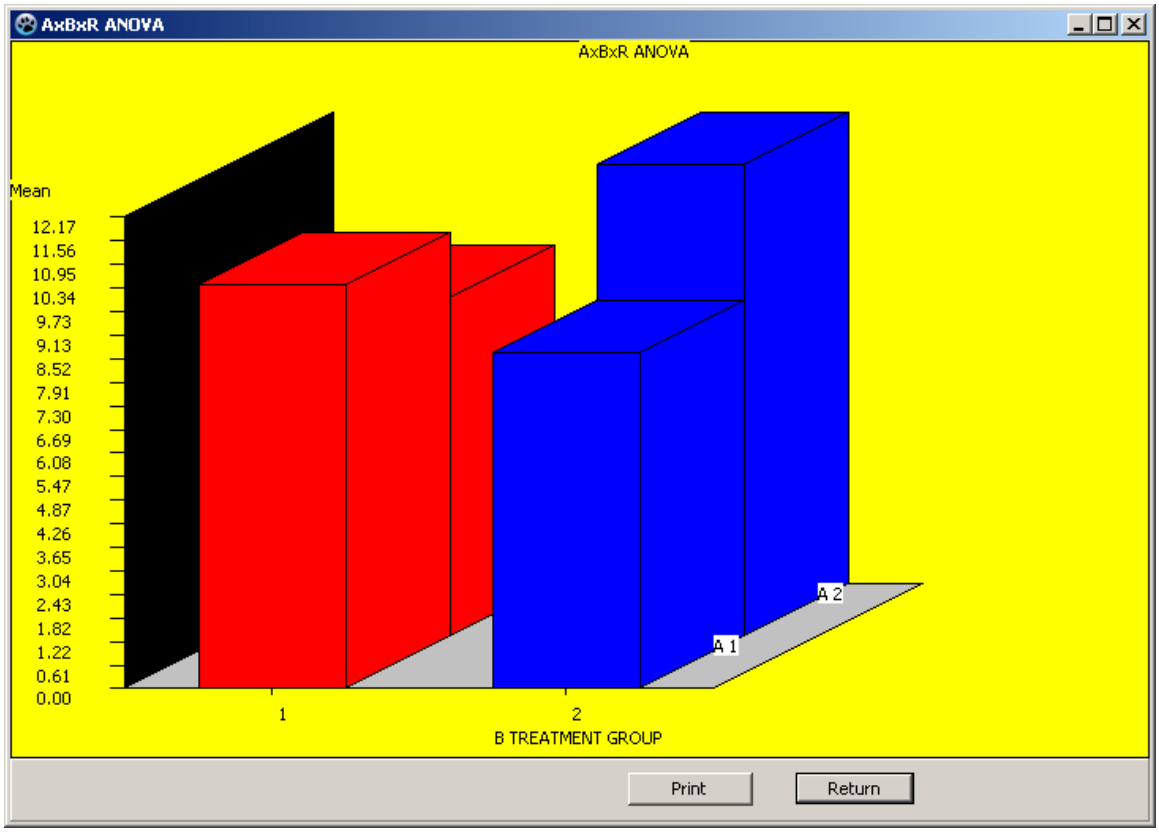
	C1	C2	C3	C4
C1	3.000	4.188	1.083	-0.635
C2	3.000	8.250	5.260	1.833
C3	1.000	5.375	6.625	3.729
C4	-0.500	2.375	4.167	3.104

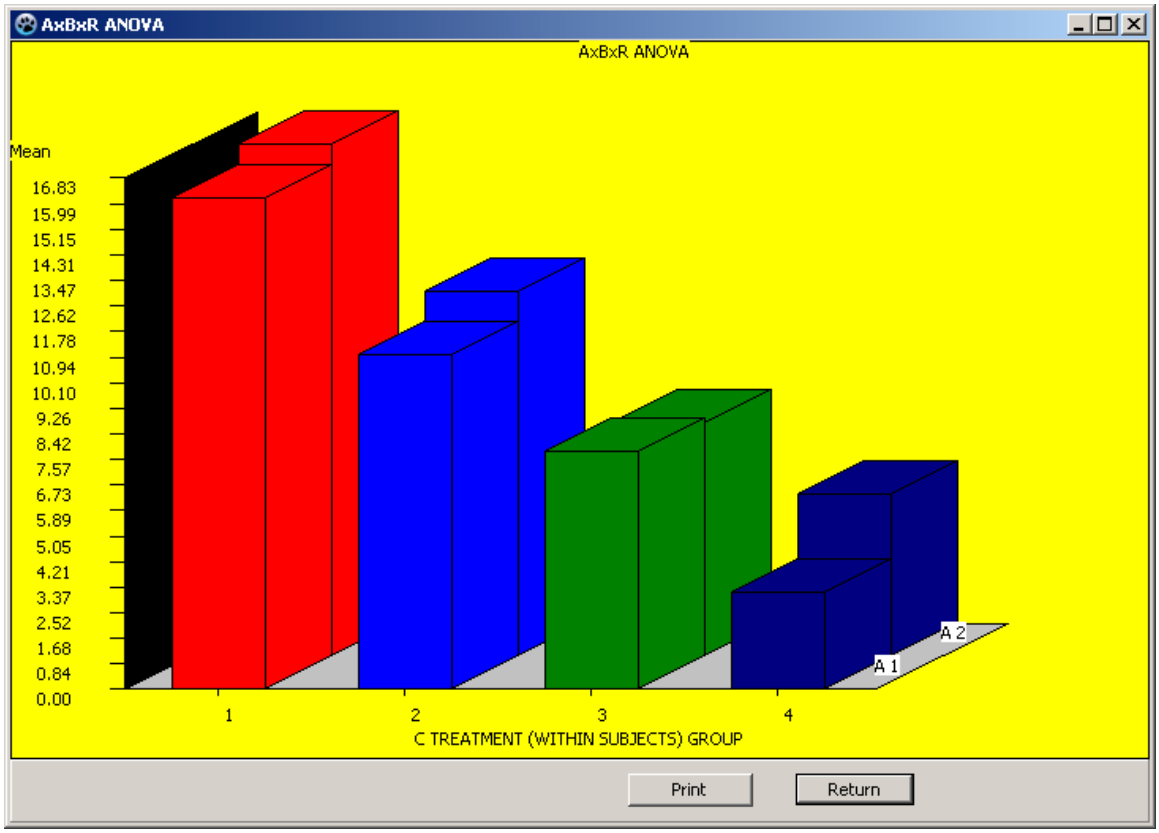
Pooled Variance-Covariance AMatrix with 12 cases.
Variables

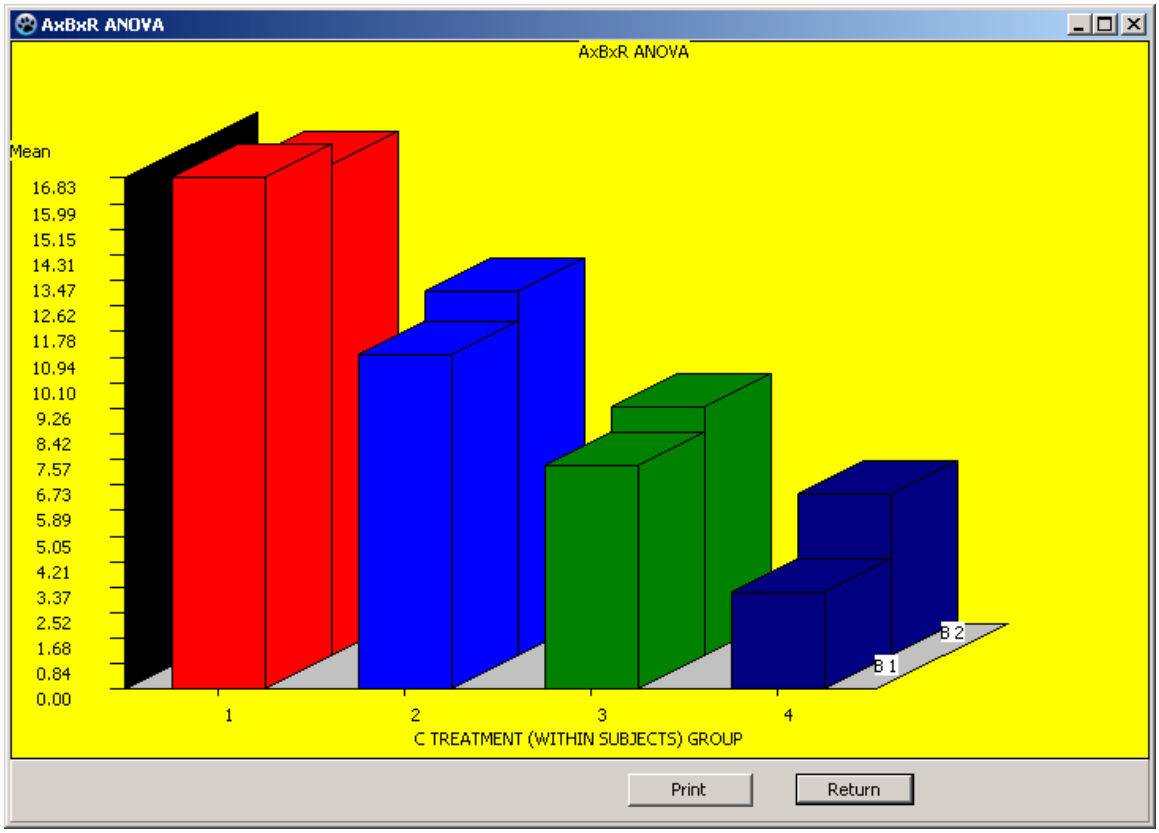
	C1	C2	C3	C4
C1	5.167	6.203	3.563	1.701
C2	2.250	8.938	7.727	4.375
C3	1.000	8.156	10.677	6.318
C4	0.375	6.406	7.958	5.807

Test that sample covariances are from same population:
Chi-Squared := 11.222 with 30 degrees of freedom.
Probability of > Chi-Squared := 0.999

Test that variance-covariances AMatrix has equal variances and equal covariances:
Chi-Squared := 8.589 with 8 degrees of freedom.
Probability of > Chi-Squared := 0.378




AxBxR ANOVA
AxBxR ANOVA
Mean
16.83
15.99
15.15
14.31
13.47
12.62
11.78
10.94
10.10
9.26
8.42
7.57
6.73
5.89
5.05
4.21
3.37
2.52
1.68
0.84
0.00
1
2
3
4
C TREATMENT (WITHIN SUBJECTS) GROUP
A 2
A 1
Print
Return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2
3
4
C TREATMENT (WITHIN SUBJECTS) GROUP
B 2
B 1
Print
Return