Test Description	Order of data	Xβ	Hypothesis Test
One-sample t-test. 6 observations	G_1 G_2 G_3 G_4 G_5 G_6	$\begin{pmatrix}1\\1\\1\\1\\1\\1\end{pmatrix}\begin{pmatrix}\beta_1\end{pmatrix}$	H_0:Overall mean=0 H_0:β_1=0 H_0:cβ=0 c=[1]
Two-sample t-test. 5 subjects in group 1 (G1) and 5 subjects in group 2 (G2)	$G1_1$ $G1_2$ $G1_3$ $G1_4$ $G1_5$ $G2_1$ $G2_2$ $G2_3$ $G2_4$ $G2_5$	$\begin{pmatrix}1&0\\1&0\\1&0\\1&0\\1&0\\0&1\\0&1\\0&1\\0&1\\0&1\end{pmatrix}\begin{pmatrix}\beta_{G1}\\\beta_{G2}\end{pmatrix}$	H_0:mean of G1 different from G2 H_0:$\beta_{G1}-\beta_{G2}$=0 H_0:cβ=0 c=[1 -1]
Paired t-test. 5 paired measures of A and B.	A_{S1} B_{S1} A_{S2} B_{S2} A_{S3} B_{S3} A_{S4} B_{S4} A_{S5} B_{S5}	$\begin{pmatrix}1&1&0&0&0&0\\-1&1&0&0&0&0\\1&0&1&0&0&0\\-1&0&1&0&0&0\\1&0&0&1&0&0\\-1&0&0&1&0&0\\1&0&0&0&1&0\\-1&0&0&0&1&0\\1&0&0&0&0&1\\-1&0&0&0&0&1\end{pmatrix}\begin{pmatrix}\beta_{diff}\\\beta_{S1}\\\beta_{S2}\\\beta_{S3}\\\beta_{S4}\\\beta_{S5}\end{pmatrix}$	H_0:A is different from B H_0:β_{diff}=0 H_0:cβ=0 c=[1 0 0 0 0 0]
Two way ANOVA. Factor A has two levels and factor B has 3 levels. There are 2 observations for each A/B combination.	$A1B1_1$ $A1B1_2$ $A1B2_1$ $A1B2_2$ $A1B3_1$ $A1B3_2$ $A2B1_1$ $A2B1_2$ $A2B2_1$ $A2B2_2$ $A2B3_1$ $A2B3_2$	$\begin{pmatrix}1&1&1&0&1&0\\1&1&1&0&1&0\\1&1&0&1&0&1\\1&1&0&1&0&1\\1&1&-1&-1&-1&-1\\1&1&-1&-1&-1&-1\\1&-1&1&0&-1&0\\1&-1&1&0&-1&0\\1&-1&0&1&0&-1\\1&-1&0&1&0&-1\\1&-1&-1&-1&1&1\\1&-1&-1&-1&1&1\end{pmatrix}\begin{pmatrix}\beta_{mean}\\\beta_{A1}\\\beta_{B1}\\\beta_{B2}\\\beta_{A1B1}\\\beta_{A1B2}\end{pmatrix}$	F-tests for all contrasts H_0:Overall mean=0 H_0:β_{mean}=0 H_0:cβ=0 c=[1 0 0 0 0 0] H_0:Main A effect=0 H_0:β_{A1}=0 H_0:cβ=0 c=[0 1 0 0 0 0] H_0:Main B effect=0 H_0:$\beta_{B1}=\beta_{B2}$=0 H_0:cβ=0 $c=\begin{bmatrix}0&0&1&0&0&0\\0&0&0&1&0&0\end{bmatrix}$ H_0:A/B interaction effect=0 H_0:$\beta_{A1B1}=\beta_{A1B2}$=0 H_0:cβ=0 $c=\begin{bmatrix}0&0&0&0&1&0\\0&0&0&0&0&1\end{bmatrix}$