1. The means model and the effects model for two-way ANOVA are equivalent.

   True

   False

2. Consider the means model for two-way ANOVA as described in our video:

$$Y_{ijk} = \mu_{jk} + \varepsilon_{ijk}$$

where Y_{ijk} is the i^{th} measurement of the response in the j^{th} level of the τ factor and the k^{th} level of the α factor; and $i = 1, ..., n_{jk}$.

n_{jk} is the total number of observations in the study/experiment.

   False

   True

3. In the two-way ANOVA effects model, τ_j can be interpreted as:

   the true difference between the grand mean and the mean of the response in the j^{th} level of the τ factor, holding the α factor constant.

   the true difference between the grand mean and the mean of the response in the j^{th} level of the τ factor, holding the α factor at its mean value.

   The causal effect of the j^{th} level of the τ factor, adjusting for the α factor.

   the true difference between the grand mean and the mean of the response in the j^{th} level of the τ factor, adjusting for the α factor.

4. The error term in the two-way ANOVA means model is assumed to be distributed as:

$\varepsilon_{ijk} \overset{i}{\sim} N(0, \sigma_i^2)$.

$\varepsilon_{ijk} \overset{iid}{\sim} N(0, \sigma_i^2)$.

$\varepsilon_{ijk} \overset{iid}{\sim} N(0, \sigma^2)$.

$\varepsilon_{ijk} \overset{id}{\sim} N(0, \sigma^2)$.

5. Consider the two-way ANOVA effects model:

$$Y_{ijk} = \mu + \tau_j + \alpha_k + \varepsilon_{ijk}$$

and suppose that, for all levels of α, the mean response for units in τ_1 is greater than the mean response for units in τ_2. Then, necessarily, the move from τ_1 to τ_2 causes the increase in the mean response.

   True

   False

6. 3 / 3 points

Factor A	factor B	Response
1	1	10.9
2	1	9.2
3	1	8.0
1	2	8.6
2	2	11.1
3	2	7.3
1	3	9.9
3	3	8.5

Suppose that the data frame above is an entire two-factor study. Does this data frame constitute a full factorial design?

   Yes

   No