Student Worksheet: Stroop GLM (Hands-on exercises 3)

Learning Goals

- Understand what regressors and contrasts are.
- Practice analyzing differences between conditions.
- Visualize brain activation patterns.

E1. Design Matrix Visualization

Task:
Look at the plot showing the "Congruent" and "Incongruent" regressors.

Questions:

1. What does each regressor represent?
2. Are the two regressors overlapping or separated in time?
3. What does this tell you about the experimental design?

E2. Contrast: Congruent > Incongruent

Task:
The code computes a statistical contrast between congruent and incongruent trials.

Questions:

1. What does a contrast vector like [1 -1 0] mean?
2. Why do we include a constant (intercept) in the design matrix?
3. What does a large positive t-value mean in this case?

E3. t-map Visualization

Task:
The figure shows a slice of a t-map from the contrast Congruent > Incongruent.

Questions:

1. What does each voxel in the figure represent?
2. What kind of brain areas show high t-values (bright colors)?
3. Could the opposite contrast (Incongruent > Congruent) show different regions? How would you test that?

E4. Write code in which the following contrast “Incongruent > Congruent” is applied