You have been hired by a VisageTome, the hottest new social network. Your boss (Zark Muckerberg) has tasked you with modeling how often users log into the platform, how much time they spend on the platform, and what factors are most predictive of both.

Using the attached dataset, you should prepare a report (as a **HTML compiled** RMD document) that fully answers the following questions:

1. What demographic features are most predictive of engagement with the platform? What features are most predictive of level of engagement?
2. What are the impacts of time of day and day of the week on engagement and level of engagement?
3. Senior Data Engineers often whisper about the mythical superusers, users who spend entirely too much time on the platform. Are there any super users of the platform? i.e. anybody who is using the platform much more often than similar individuals? Please provide a justification for how you define super users. Determine if super user status would impact the rest of the estimates from your model.
4. What are the demographic features of super users?

When you write your report, remember to write it for educated stakeholders but not for somebody who has expertise in statistical modeling. Your job is to translate the models that you present into actionable insights, and the stakeholders will likely not care all that much about technical details. In fact, Ole Mucky (he insists employees call him that) has a tendency to clutch his head and scream about "the coming disruption" when he sees any Greek characters in a report (he has been banned from Greece).

The data set you've been given is structured as follows:
Each row is a 4 hour block of time for a given user. These blocks of time cover morning, midday and evening. The outcome is MinPerBlock, which is the number of minutes a user is engaging with the platform during that time period.

- Day of the week is also available.
- Demographics: Gender, Age and Nationality.

Some tips from Teague:

- Consider the response distributions carefully.
- Consider your hierarchical effects carefully, only some of your predictors can be specified to have random effects.
- I've generated and tested the models, so there shouldn't be any issues with fitting them.

- Remember, you can use variational inference or samplers (depending on your taste/judgement).
- If you are running into memory errors (i.e. the models are just not working on your machine), you should do the following: Beta test your models using a subset of the data (10 people out of 100 for example), just so you know the models run, then put it all up on Rivanna to run the full 100 person model.

I (Teague) fit this model on my work laptop using the following options (note these are purely computational, you still need to build the right model, as well as specify the right response family). It took ~800 seconds a chain, 13 ish minutes each. If you set that seed (and have an identical model to mine (which is not required for full credit!)), then your results would be identical to mine.

```
fit <- brm(
  formula = formula,
  data = data,
  prior = priors,
  chains = 2,
  iter = 2000,
  warmup = 1000,
  seed = 123
)
```