Final Exam

694R: Advanced Choice Modeling

4/6/2021

> This is your final exam. The final will have a similar format, but with a different data set. All resources are available to you, including notes, the course textbook, the internet, etc., but *not* your classmates.

At the link below, I have placed an `.rds` file containing the daily activity pattern chosen for a random sample of individuals who responded to the National Household Travel Survey.

```
# load dap object into workspace
dap <- read_rds(url("https://github.com/byu-transpolab/wheelchair_cdap2/raw/master/data/person_dap.rds")
# show first ten rows of data
dap
```

```
## # A tibble: 8,845 x 13
##    id    dap   dap2  r_age educ  r_hisp r_sex r_race worker disttowk17 hhvehcnt
##    <chr> <chr> <chr> <dbl> <fct> <fct>  <fct> <fct>  <fct>       <dbl>    <dbl>
##  1 3000~ M     W_1      45 Grad~ No, N~ Fema~ White  Yes         14.6         1
##  2 3000~ H     H        45 Bach~ No, N~ Male  White  Yes         20.2         1
##  3 3000~ M     W_1      28 Grad~ No, N~ Fema~ White  Yes         14.1         2
##  4 3000~ M     W_1      31 Grad~ No, N~ Male  White  Yes          9.52        2
##  5 3000~ M     W_1      46 Bach~ No, N~ Male  White  Yes         NA           2
##  6 3000~ M     W_2      49 Bach~ No, N~ Fema~ Black~ Yes         13.6         1
##  7 3000~ H     H        30 Bach~ No, N~ Fema~ White  Yes         NA           1
##  8 3000~ H     H        29 Bach~ No, N~ Male  White  Yes          0.28        1
##  9 3000~ NM    NM       37 Bach~ No, N~ Fema~ White  Yes         NA           2
## 10 3000~ M     W_1      36 High~ No, N~ Male  White  Yes         24.0         2
## # ... with 8,835 more rows, and 2 more variables: hhsize <dbl>, hhfaminc <fct>
```

Each of the 8845 individuals in the data has six alternatives for their overall daily activity pattern:

- `H`: the person spent the entire day at *home*, with no trips.
- `NM`: the person left the house any number of times to conduct *non-mandatory* activities: shopping, entertainment, social engagements, etc.
- `W_1`: the person left the house for *one work* tour, meaning they left their home, went to work, and returned home with any number of other activities or non-mandatory tours in their day.
- `W_2`: the person left the house for *two work* tours, meaning they left their home, went to work, and returned home before leaving for work and returning once more.
- `S_1`: the same as `W_1`, but the person went to school instead of work.
- `S_2`: the same as `W_2`, but the person went to school instead of work.

A complete data dictionary and codebook is available at the Oak Ridge National Laboratory Website if you need clarification on variable names. I have converted the original numeric codings to meaningful labels already. You can transform this dataset into a choice modeling dataset with the code below.

```
choice_data <- dfidx(dap, choice = "dap2", idnames = "id", shape = "wide")
```

Identify a preferred model to explain daily activity pattern choice. Consider the following in your identification

process:

- Alternative representations of model parameters (e.g., log transforms and divisions).
- Statistical significance and behavioral intuitiveness of the model parameters.
- Comparative relationships between model parameters (e.g., value of time estimate).
- Statistical goodness of fit tests between candidate models.
- Data segmentation
- Nesting structures

Construct your analysis in an Rmarkdown file, paired with appropriate textual discussion. Expose your model code, but print your model results and statistical tests in publication-quality HTML tables. Submit your html file to the assignment on Learning Suite before the deadline, after confirming that you can view the file independently in a web browser.