STAT 471: Midterm Exam Dry Run

Please make sure you can successfully compile this document to PDF well in advance of the midterm exam. If not, please consult the teaching staff for help as soon as possible.

1 Test load packages

```r
library(kableExtra)                     # for printing tables
library(cowplot)                        # for side by side plots
library(glmnetUtils)                    # to run ridge and lasso
library(lubridate)                      # for dealing with dates
library(maps)                           # for creating maps
source("../../functions/plot_glmnet.R") # for lasso/ridge trace plots
library(tidyverse)                      # for everything else
```
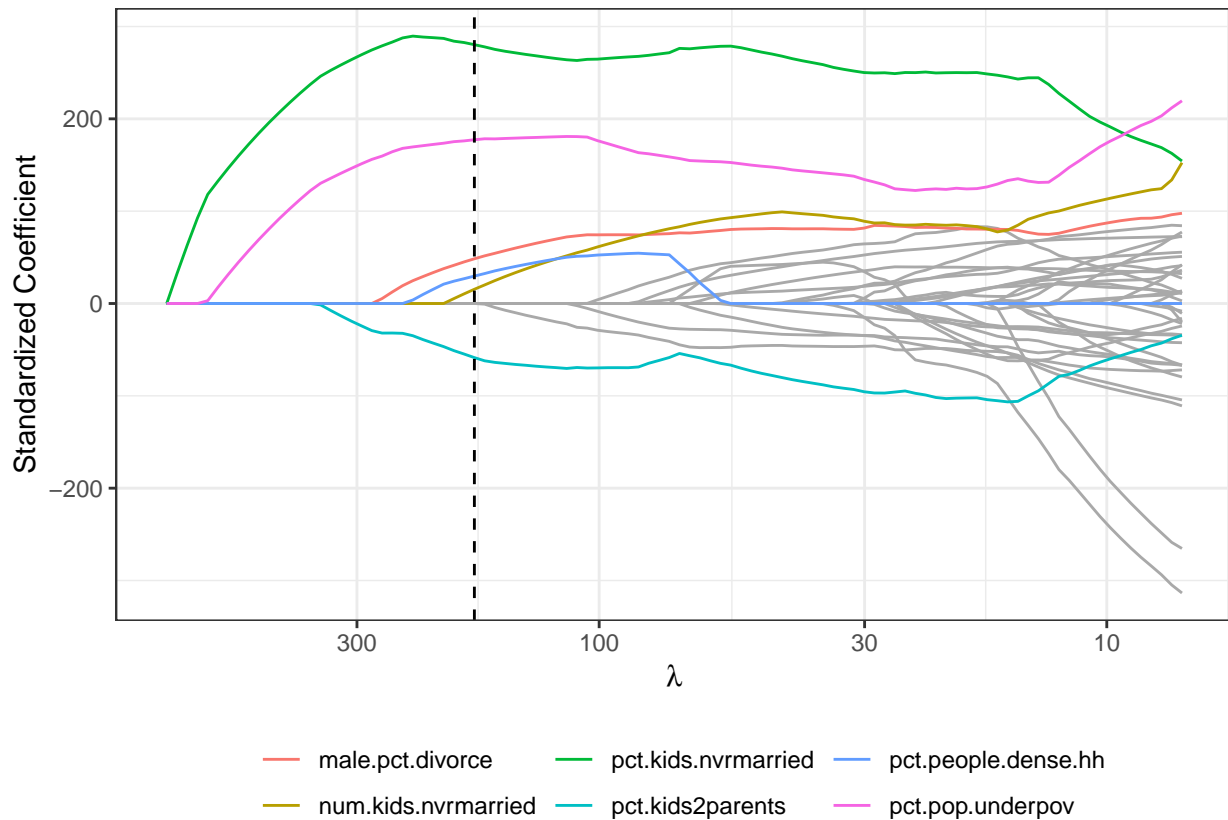
2 Test `glmnetUtils`

```r
crime_data = read_csv("../../data/CrimeData_FL.csv")
lasso_fit = cv.glmnet(violentcrimes.perpop ~ .,  # formula notation, as usual
                      alpha = 1,                 # alpha = 1 for lasso
                      nfolds = 10,               # number of folds
                      data = crime_data)         # data to run lasso on
```

3 Test `plot_glmnet`

```r
plot_glmnet(lasso_fit, crime_data, features_to_plot = 6)
```

4 Test `maps`

Figure 1 displays a map of Florida.

```r
# create a map of Florida
map_data("county") %>%
  as_tibble() %>%
  filter(region == "florida") %>%
  ggplot() +
  geom_polygon(data=map_data("state") %>% filter(region == "florida"),
               aes(x=long, y=lat, group=group),
               color="black", fill=NA,  size = 1, alpha = .3) +
  geom_polygon(aes(x=long, y=lat, group=group),
               fill = "dodgerblue",
               color="black", size = .25) +
  theme_void()
```

5 Test `kableExtra`

Table 1 displays a simple table.

```r
tibble(x = 1:5, y = 6:10) %>%
  kable(format = "latex", row.names = NA,
        booktabs = TRUE, digits = 2,
        col.names = c("Column 1", "Column 2"),
        caption = "This is a simple table.") %>%
  kable_styling(position = "center")
```
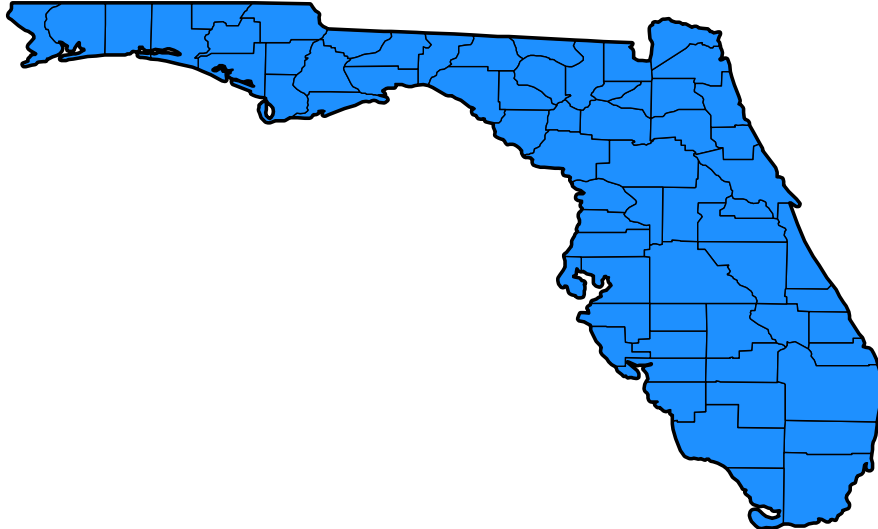
Figure 1: This is ia map of Florida.

Table 1: This is a simple table.

| Column 1	Column 2
1	6
2	7
3	8
4	9
5	10

6   Test `cowplot`

```
# create a map of Florida
fl_map = map_data("county") %>%
  as_tibble() %>%
  filter(region == "florida") %>%
  ggplot() +
  geom_polygon(data=map_data("state") %>% filter(region == "florida"),
               aes(x=long, y=lat, group=group),
               color="black", fill=NA,  size = 1, alpha = .3) +
  geom_polygon(aes(x=long, y=lat, group=group),
               fill = "dodgerblue",
               color="black", size = .25) +
  ggtitle("Florida") +
  theme_void()

# create a map of Georgia
ga_map = map_data("county") %>%
  as_tibble() %>%
  filter(region == "georgia") %>%
  ggplot() +
  geom_polygon(data=map_data("state") %>% filter(region == "georgia"),
               aes(x=long, y=lat, group=group),
               color="black", fill=NA,  size = 1, alpha = .3) +
  geom_polygon(aes(x=long, y=lat, group=group),
               fill = "dodgerblue",
               color="black", size = .25) +
  ggtitle("Georgia") +
  theme_void()

# concatenate plots
plot_grid(fl_map, ga_map)
```
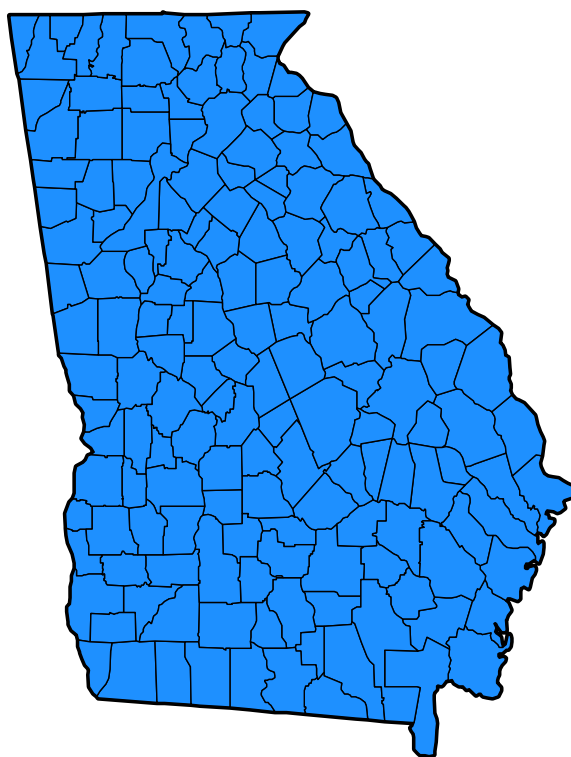
Florida
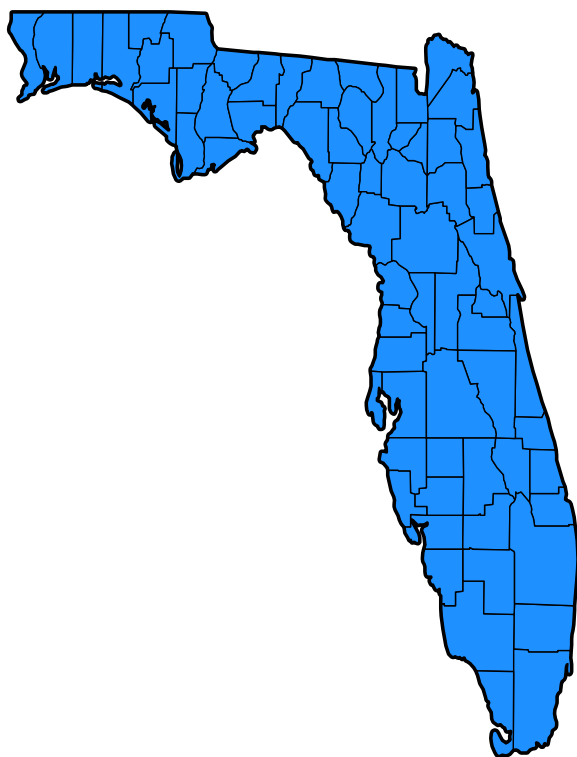
Georgia

7 Test `lubridate`

```
# extract today's date
date = today()
date
```

```
## [1] "2021-10-17"
```

```
# extract day
day(date)
```

```
## [1] 17
```

```
# extract month
month(date)
```

```
## [1] 10
```

```
# extract year
year(date)
```

```
## [1] 2021
```