**Data Sources:**

1. Python package called FastF1
   1. Built from two sources
      1. The Ergast Developer
      2. Official Formula1 Data Stream

**Project Summary:**

The goal was to predict when a pit stop would be made during a Formula1 Race using Bayesian Equilibrium. The idea stemmed from a book on predicting political policy decisions from a sought after consultant who used a similar concept for his work. Bayesian analysis was seen as an ideal method as we can adjust the probabilities for each lap a pit stop did not occur.

There were significant data issues that prevented this analysis to occur. Instead we ran a Poisson regression and other more basic models for statistical analysis.

**Languages**:

1. Python (10600 lines, which can be reduced to 2800 by removing some visualizations)
   1. 2400 lines of data prep
   2. 400 lines of statistical analysis
   3. 7800 lines of graphing courses
2. R (800 lines)
   1. 500 lines of code for shiny app
   2. 300 lines of statistical analysis

**Software**:

1. Anaconda
2. Jupyter
3. Spyder
4. RStudio
5. Shiny
6. Microsoft (Word, Excel, CSV)

**Python Packages/Libraries:**

1. import numpy as np
2. import pandas as pd
3. import fastf1 as ff1
4. from fastf1 import plotting
5. plotting.setup\_mpl()
6. import matplotlib.pyplot as plt
7. from matplotlib.collections import LineCollection
8. from matplotlib import cm
9. import plotly.express as px
10. import plotly.graph\_objs as go
11. from sklearn import linear\_model
12. from sklearn.metrics import accuracy\_score, confusion\_matrix, classification\_report
13. from patsy import dmatrices
14. import statsmodels.api as sm
15. import statsmodels.formula.api as smf
16. import rpy2.robjects as ro
17. from rpy2.robjects import pandas2ri
18. import os

**R Packages/Libraries:**

1. library(tidyverse)
2. library(readxl)
3. library(lubridate)
4. library(pscl)
5. library(lmtest)
6. library(sandwich)
7. library(geepack)
8. library(flexmix)
9. library(lme4)
10. library(plotly)
11. library(jpeg)
12. library(officer)
13. library(magrittr)
14. library(MASS)

**Models:**

1. poisson (python and r)
2. negative binomial (python and r)
3. famoye poisson (python)
4. consul poisson (python)
5. random forest (python)
6. quasi-poisson (r)
7. generalized estimated equation glm (r)
8. flexmix (r)
9. Bayesian (r) ????