STATS 418 PROPOSAL:
CO_2 CONCENTRATION W/PREDICTIONS

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API: DAILY ATMOSPHERE CARBON DIOXIDE CONCENTRATION

- I will be using the Daily atmosphere carbon dioxide concentration API by Rene R. from RapidAPI.com. It hosts 10 years of historical daily CO_2 concentrations (up to current day!) including both the snapshot level and the long-term overall increase accounting for seasonal fluctuations.

- Reasons for choice:

  - I've always been conscious of and interested in the subject.

  - Among many other fields of research, NASA, my dream org, spends a lot of time focusing on climate data. This will definitely not be nearly as complex or interesting as what they do, but it's a start…maybe?

  - I wanted to use a simple dataset so that I can focus more time on the application itself.

  - It's free lol. 500,000 requests a month for $Free.99 is pretty good.

- Link: https://rapidapi.com/rene-mdd/api/daily-atmosphere-carbon-dioxide-concentration

DATA USAGE PLAN: CREATE A TREND MODEL WITH FUTURE PREDICTIONS

- The goal I have for this dataset is to show historical data of CO_2 levels. Alongside that, I want to provide predictive values for the next 5 years based on the historical data.

- To do this, I will be creating a small SARIMA (Seasonal Autoregressive Integrated Moving Average) model. It will be trained on most of the history to provide the most up-to-date data possible.

- R supports this model with the `forecast` package. I will be using the `auto.arima()` function to make this even easier.

APP: R SHINY + AWS (PROBABLY)

- To create this app, I will be using Shiny for R. I'm pretty rusty on Python (I haven't touched it since 2016 lol), so R would be the easier language to work with.

- This app will allow the user to select a date, on which the model will perform predictions. It will give the user the historical data for that day across all of the history the API has, and provide an additional 5 years of predictive data (might change to be a user-selected range from 1-10 years).

- This will be represented as both a chart and a table with values.

- To host this application, I already have an AWS account, so I might use that, unless we have something better in the future. 👀

Thank you for coming to this TedTalk.