Data Analytics

Project Presentation
Analysis of crime against women

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Abstract and Scope

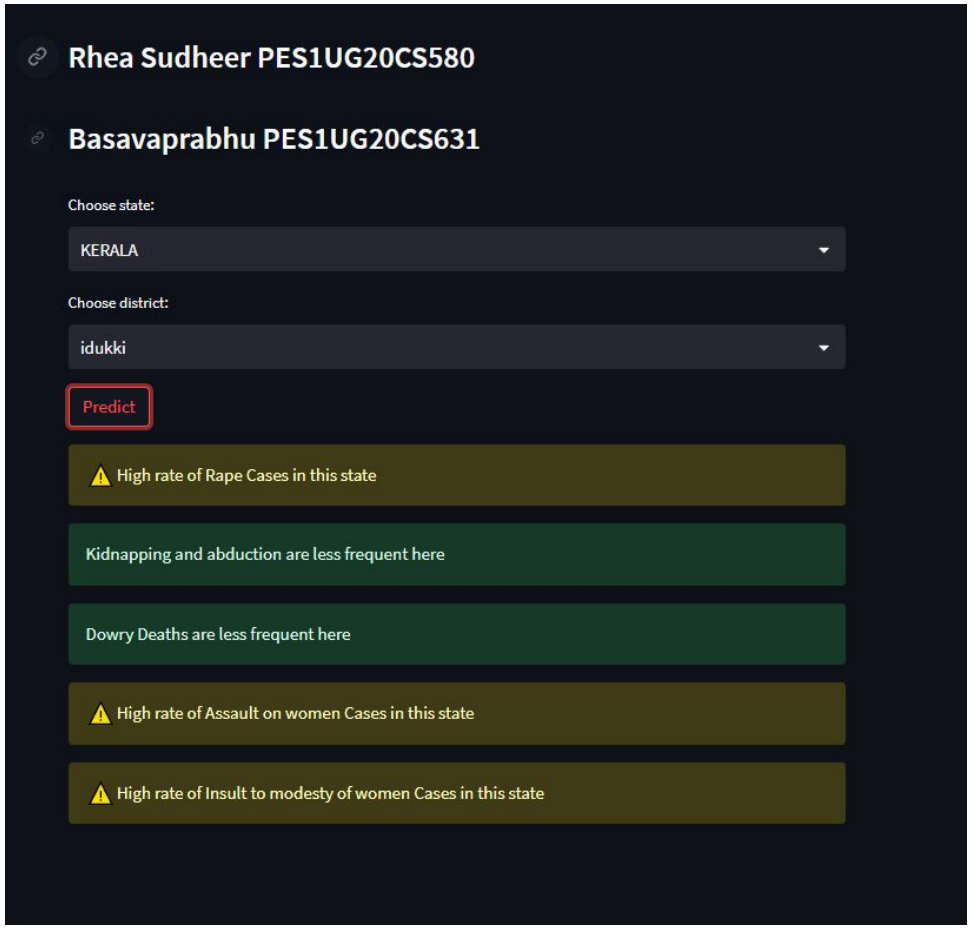
The purpose of this project is to analyse and predict different types of crimes against women in India. The prediction is done by following a systematic approach for identifying and analysing patterns and trends in the crime data set used.

A comparative analysis of crimes district-wise and state-wise and forecast the crime rate for each district for the future years using Random Forest.

Implementation Details

- Modules used: sklearn, pandas, seaborn, matplotlib, plotly, numpy,label encoding
- We alabel encoded state and district and used the user input to predict the crime rates in their state using random forest(regression), with brute force approach to estimate hyperparameters.

Project Demonstration



Test Plan and Strategy

We trained the various models on data from 2001 - 2012 and made predictions for the 13th year(2013), tested it against know values for 2013 compared results using normalised RMSE and R-square coefficient.

$$R^2 = 1 - \frac{RSS}{TSS}$$

R^2 = coefficient of determination
RSS = sum of squares of residuals
TSS = total sum of squares

$$RMSE = \sqrt{\frac{\sum_{i=1}^{N} (Predicted_i - Actual_i)^2}{N}}$$

$$NRMSE = \frac{RMSE}{y_{max} - y_{min}}$$

Results and Discussion

After trying various models for forecasting, random forests gave highest accuracy which we used to predict crime rates for future years based on the state and district name given by the user.

Conclusion and Future work

As you can see through the visualisation, crime in India is increasing at an exponential rate and it's pertinent that apt measures are taken to curb this growth rate. However, in the meanwhile, ensuring the safety of women is the primary concern.

Through our solution, we hope to make the citizens more aware of the places they travel to and hope to make a meaningful contribution at prevention of crime

Thank
You