MitchMatt / Accidents-in-kenya

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**Bossymichael** Merge pull request #124 from MitchMatt/Michael e4d5408 · 13 minutes ago

| | | |
|---|---|---|
| .ipynb_checkpoints | requirements | 2 days ago |
| .vscode | streamlit_app.py | 3 days ago |
| car crash images | update | yesterday |
| Accidents.ipynb | Created using Colab | 14 minutes ago |
| Fatality Prediction of accident... | Add files via upload | 54 minutes ago |
| LICENSE | Added Files | last week |
| README.md | update readme | yesterday |
| ma3route_crashes_algorithmc... | update | last week |
| processed_crash_data.csv | requirements | 2 days ago |
| random_forest_model_v1.0.pkl | requirements | 2 days ago |
| requirements.txt | Update on requirement | yesterday |
| scaler_v1.0.pkl | requirements | 2 days ago |
| stream | update | 16 minutes ago |
| streamlit_app.py | update | 16 minutes ago |

README License

# Accidents in Kenya - Road Accidents Fatality

# Prediction

## Group Members

1. Mitch Mathiu
2. Deborah Okeyo
3. Michael Omondi
4. Faith Wanjala


## Project Overview

This project analyzes road crashes in Kenya from 2012-2023 and builds a machine learning model to predict the likelihood of fatal outcomes in these crashes. By identifying high-risk factors and patterns, this model can support transportation agencies, public safety departments, and urban planners in developing interventions to reduce road fatalities.

## Main Objectives

- **Analyze historical crash data** to uncover patterns associated with fatal accidents.
- **Train a machine learning model** to predict the likelihood of fatalities in road crashes.
- **Deploy a web-based tool** for real-time fatality risk prediction, enabling users to enter crash details and receive a risk assessment.

## Specific Objectives

- Identify critical factors that influence fatality risks (e.g., location, time, weather).
- Provide insights to guide road safety campaigns, infrastructure improvements, and policy-making.

## Business Understanding

Road traffic accidents in Kenya contribute significantly to public health and safety challenges due to high fatality rates. Reducing these fatalities requires identifying factors that heighten death risks in crashes. This project leverages historical crash data to develop a model capable of estimating fatality probabilities, which can inform targeted safety measures.

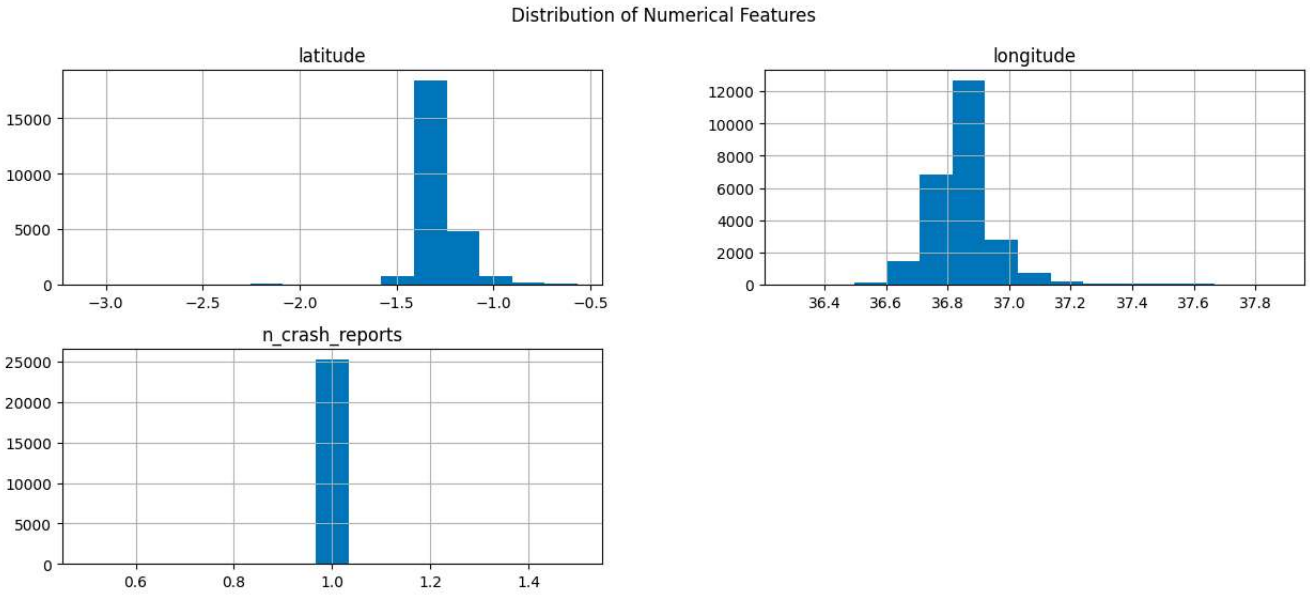
## Data Understanding

The dataset used in this project includes crash data from Kenya (2012-2023) and is sourced from the **World Bank microdata platform**. Key features in the dataset:

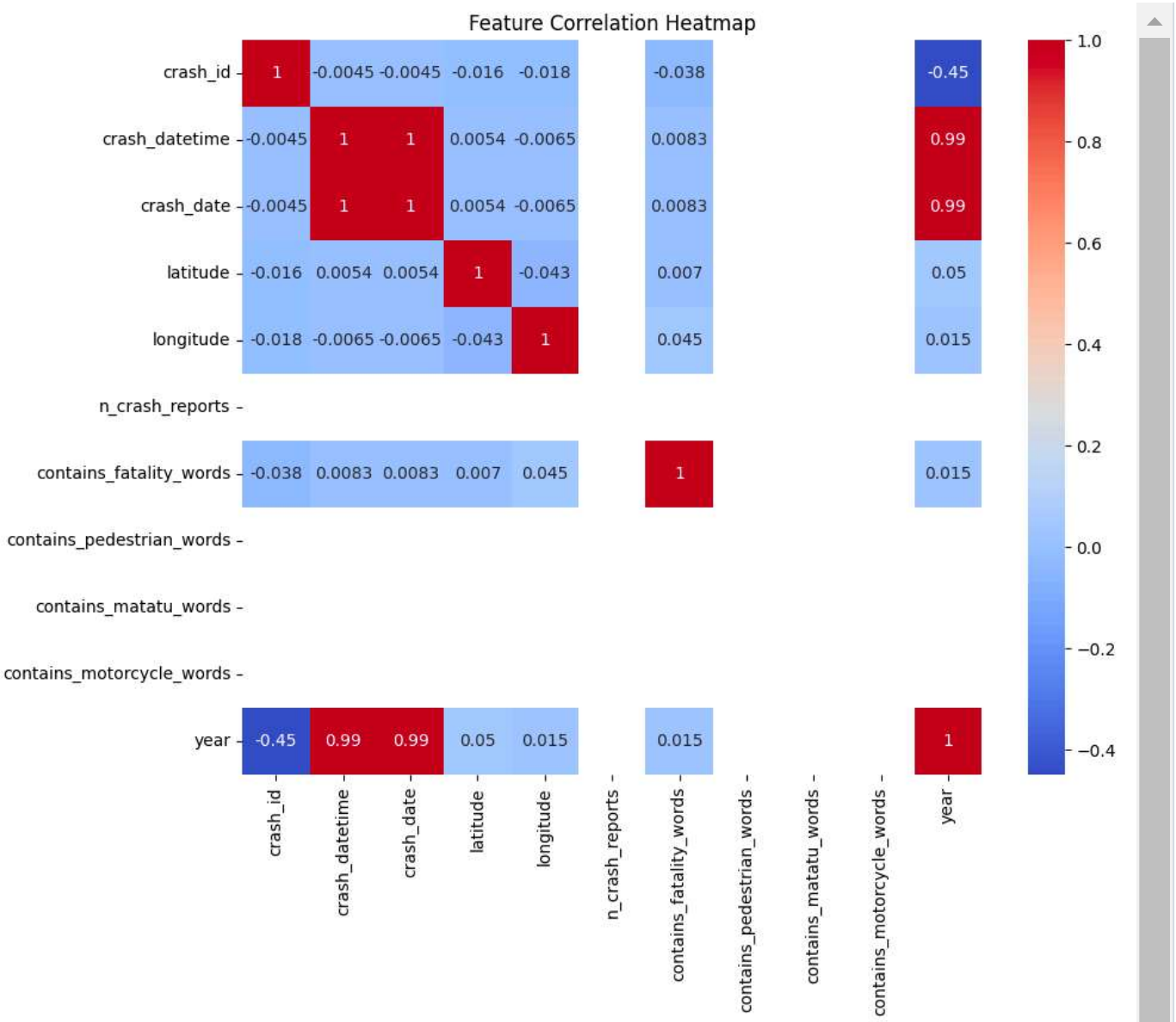
- **Crash Date and Time**: Includes the time of day and date of each crash.
- **Location**: Geographic details like latitude, longitude, and road name.
- **Crash Description Keywords**: Descriptors indicating crash details, such as "fatality," "pedestrian," or "motorcycle."
- **Weather and Road Conditions**: Environmental context, including road wetness, fog, or traffic levels.
- **Crash Outcome**: Binary indicator marking whether the crash was fatal or non-fatal.

## Exploratory Data Analysis

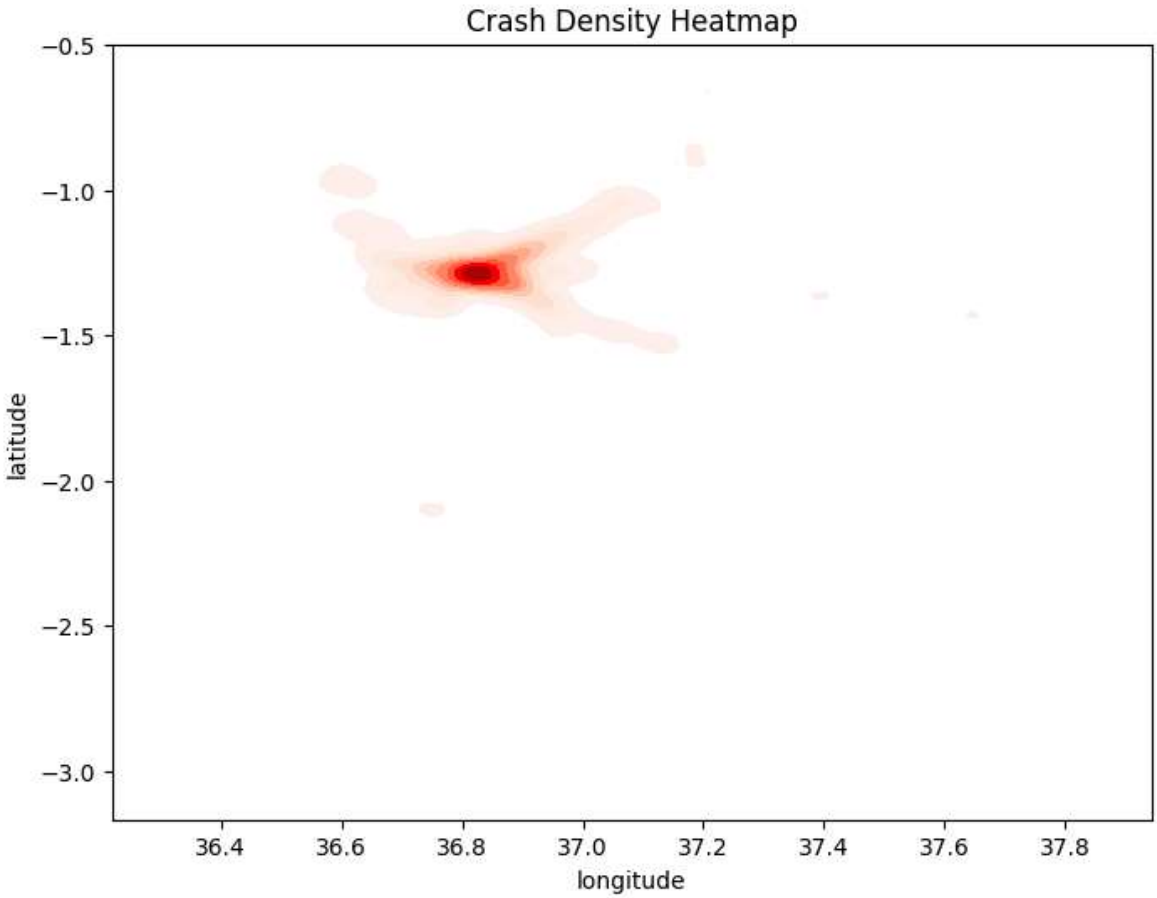
- **Univariate Analysis**: Initial analysis of each feature to understand distributions.



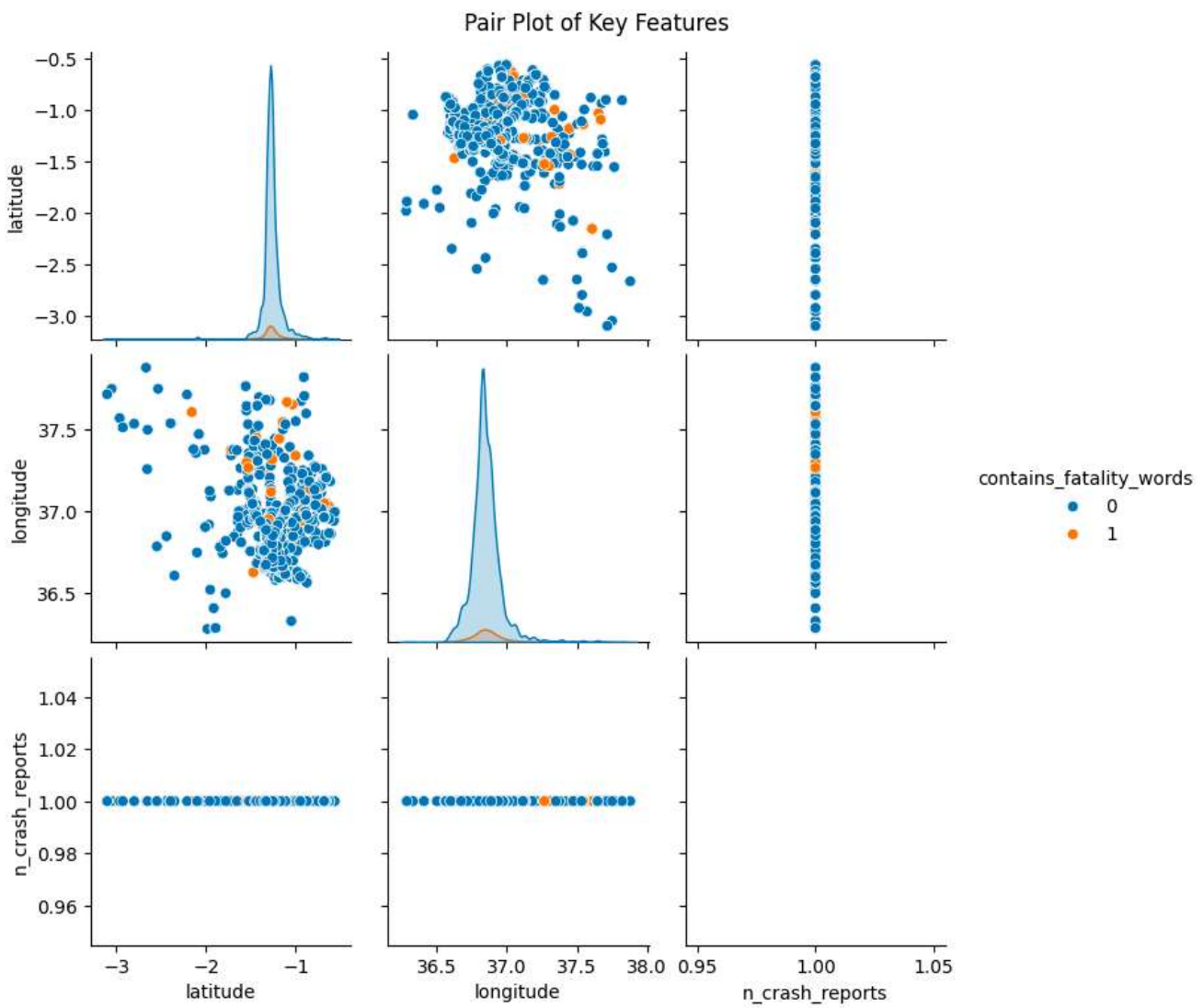

- **Bivariate Analysis**: Feature coorelation Heatmap



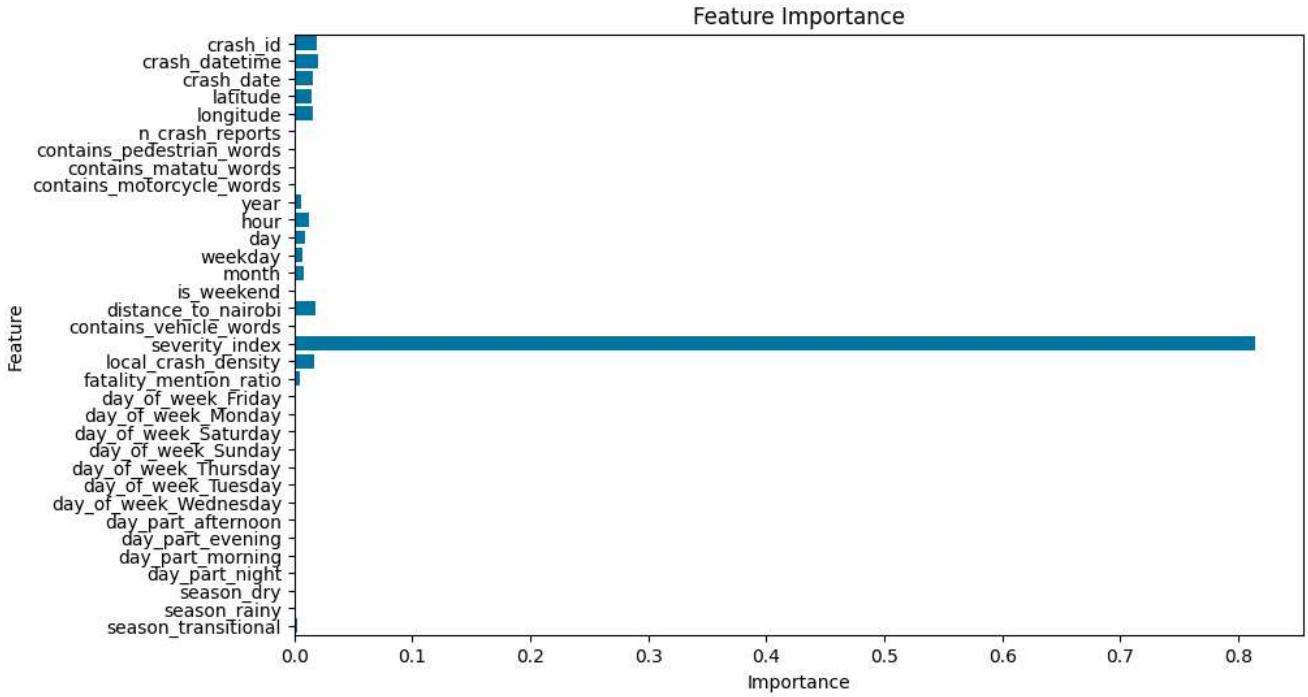

- **Geospatial Analysis**: Crash Desity Heatmap




- **Multivariate Analysis**: Multivariate Analysis




-Feature Impotence:



- **Target Variable Analysis**: Investigating the proportion and characteristics of fatal vs. non-fatal crashes.

## Modeling Approach

- **Model Selection**: Machine learning algorithms such as Logistic Regression, Random Forest, and Decision Trees were tested.
- **Feature Engineering**: Created additional variables like time-of-day indicators and high-risk zone proximity.
- **Evaluation Metrics**: Model performance is evaluated using accuracy, precision, recall, and F1-score, with a particular focus on recall to ensure that fatal cases are accurately identified.

## Web-Based Deployment

The model is deployed in a web-based interface where users can:

- Input crash details and receive a real-time prediction on fatality risk.
- View relevant risk factors and suggestions for preventive actions.

## Results

### Releases

No releases published
Create a new release

### Packages

No packages published
Publish your first package

### Contributors 4

 **Bossymichael** OCHIENG MICHAEL OMONDI

 **MitchMatt** Mitch Mathiu

 **Deborah-Okeyo**

 **Arishiine**

### Languages

**Jupyter Notebook** 99.9% **Python** 0.1%

### Suggested workflows

Based on your tech stack

**Django**

Build and Test a Django Project

Configure

**Python Package using Anaconda**

Create and test a Python package on multiple Python versions using Anaconda for package management.

Configure

**Publish Python Package**

Publish a Python Package to PyPI on release.

Configure

More workflows

Dismiss suggestions