An Analysis of Canadian Marine Accident Fatality Factors

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Week of December 5, 2022

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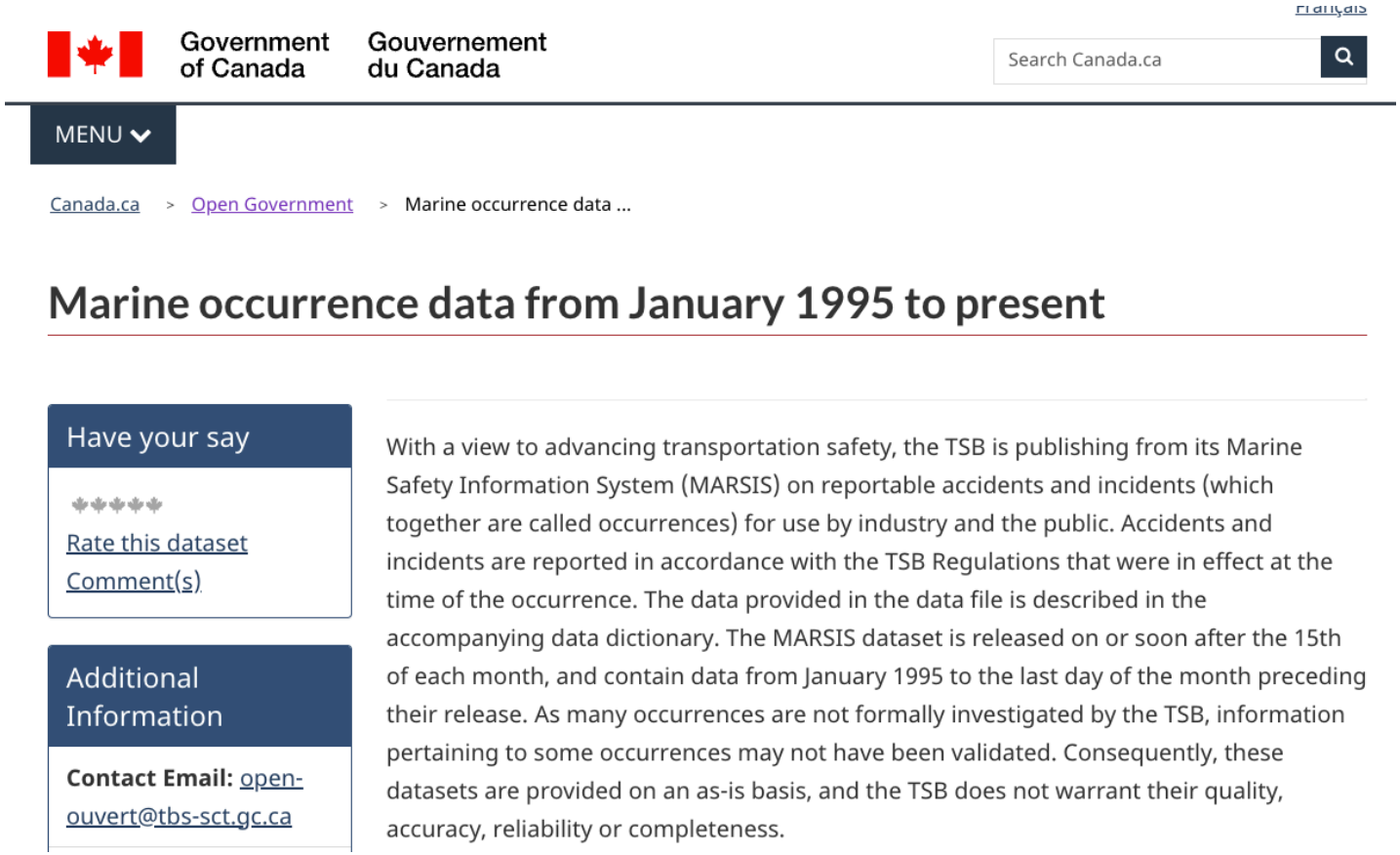
Abstract and Project Overview



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Marine occurrence data from January 1995 to present

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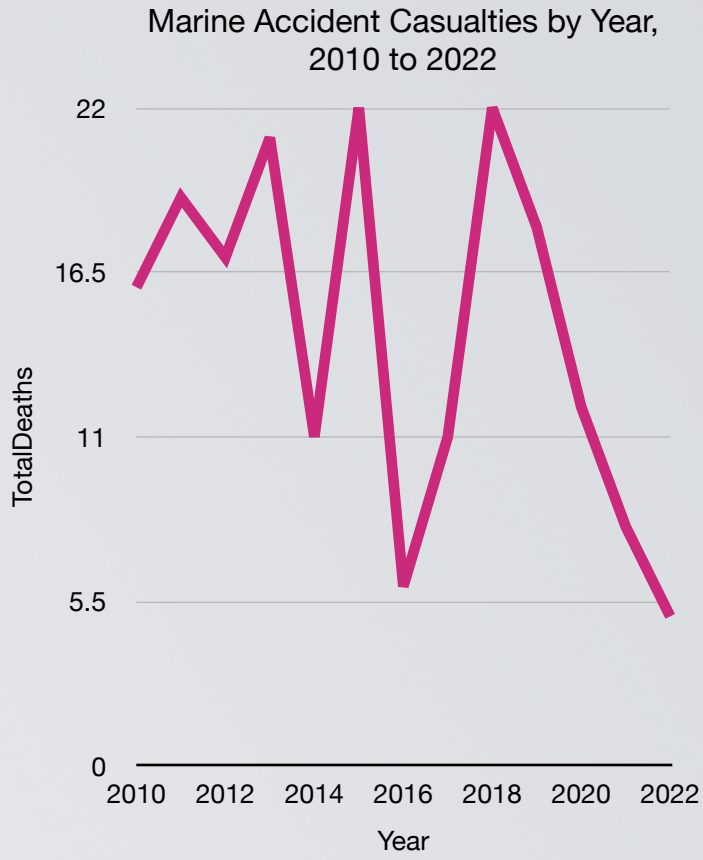
Additional Information

Contact Email: open-ouvert@tbs-sct.gc.ca

With a view to advancing transportation safety, the TSB is publishing from its Marine Safety Information System (MARSIS) on reportable accidents and incidents (which together are called occurrences) for use by industry and the public. Accidents and incidents are reported in accordance with the TSB Regulations that were in effect at the time of the occurrence. The data provided in the data file is described in the accompanying data dictionary. The MARSIS dataset is released on or soon after the 15th of each month, and contain data from January 1995 to the last day of the month preceding their release. As many occurrences are not formally investigated by the TSB, information pertaining to some occurrences may not have been validated. Consequently, these datasets are provided on an as-is basis, and the TSB does not warrant their quality, accuracy, reliability or completeness.

Literature Review, Data, and Methodology

1.Hypothesis writing and initial problem framing
2.Data collection and data imports
3.Data exploration
    3.1. Initial findings, summary statistics
    3.2 Data cleanliness and data logic
4. Feature selection
5. Feature engineering
6. Model creation
    6.1. Random Forests
    6.2 Logistic regression
    6.2. Naive Bayes
7. Model evaluation
    7.1. Model interpretation
8. Conclusions and final presentation



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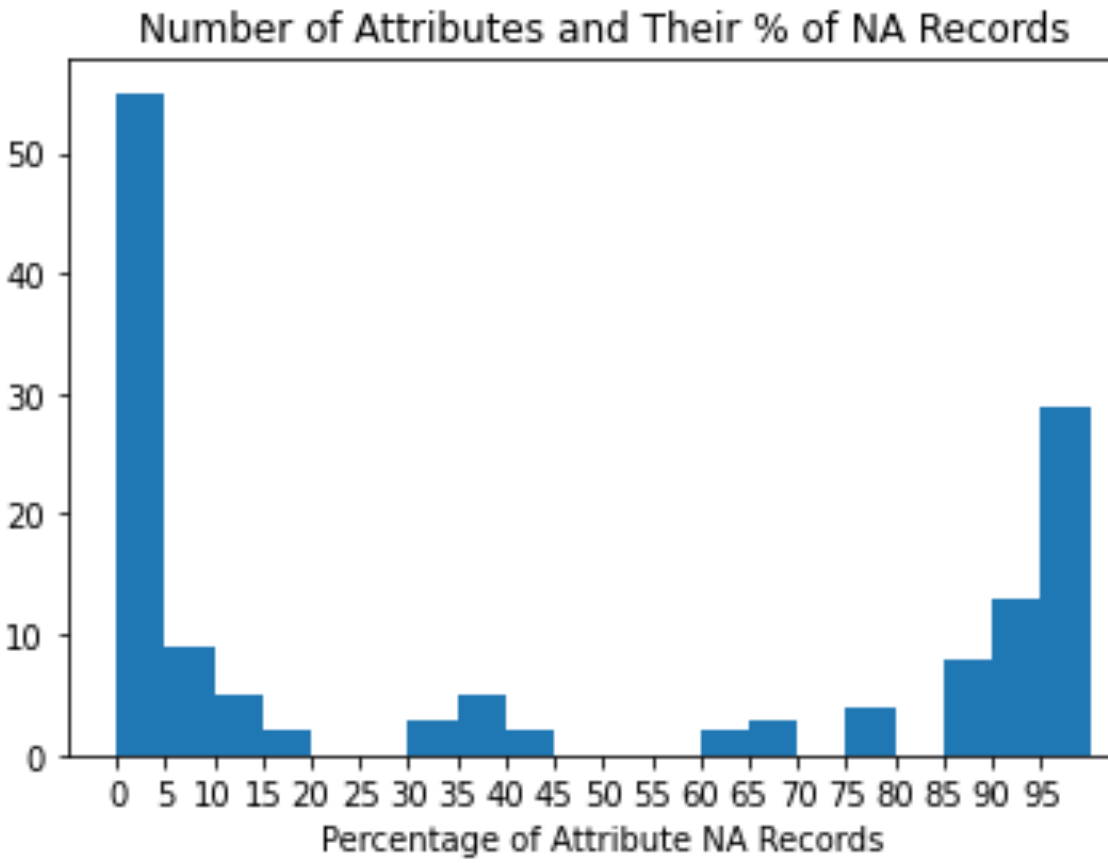
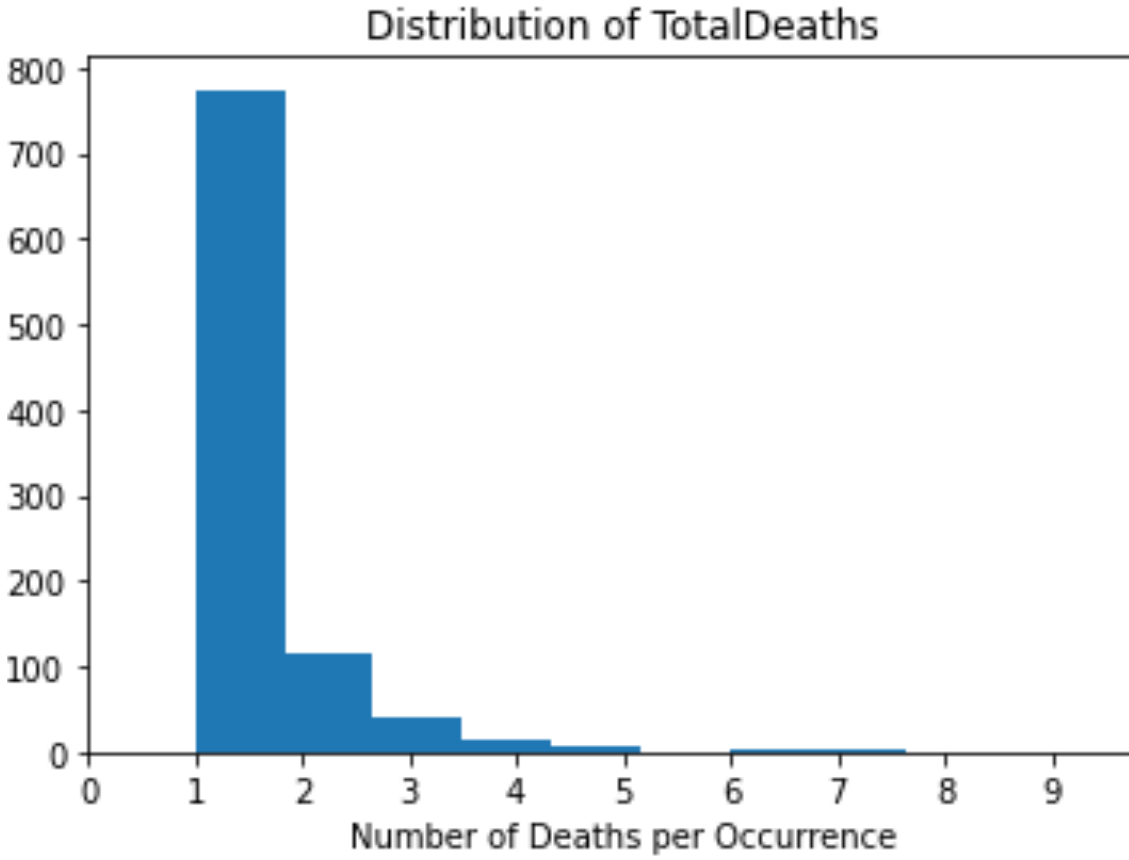
Initial Analysis of Data Under Study

- Basic data cleaning
- Contextual data cleaning
- Removing duplicate attributes, unfit attributes, low variance attributes, irrelevant to hypothesis attributes



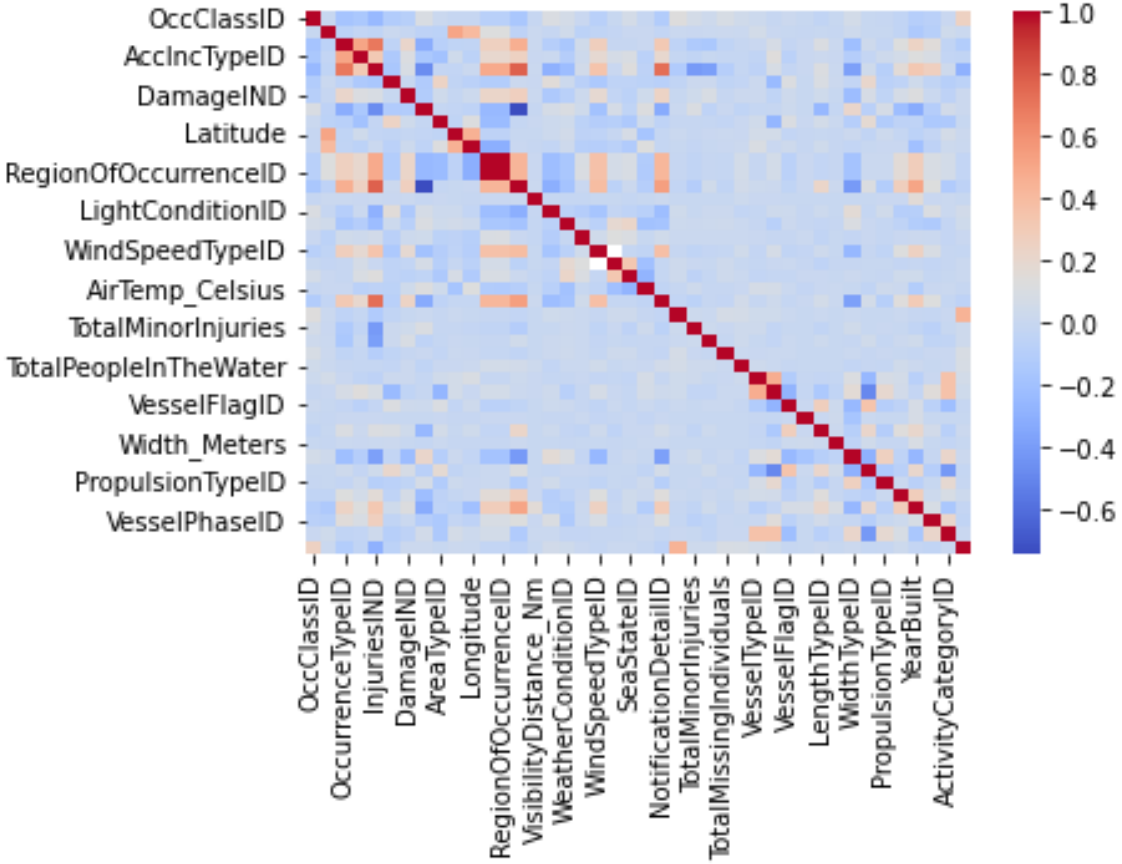
Target Attribute Creation, Data Splitting

- Target variable creation
- Identification of class levels required
- Data splitting into train, validation, and test



Formal Dimensionality Reduction

- Removal of highly correlated attributes
- Dimensionality reduction by random forests ensemble



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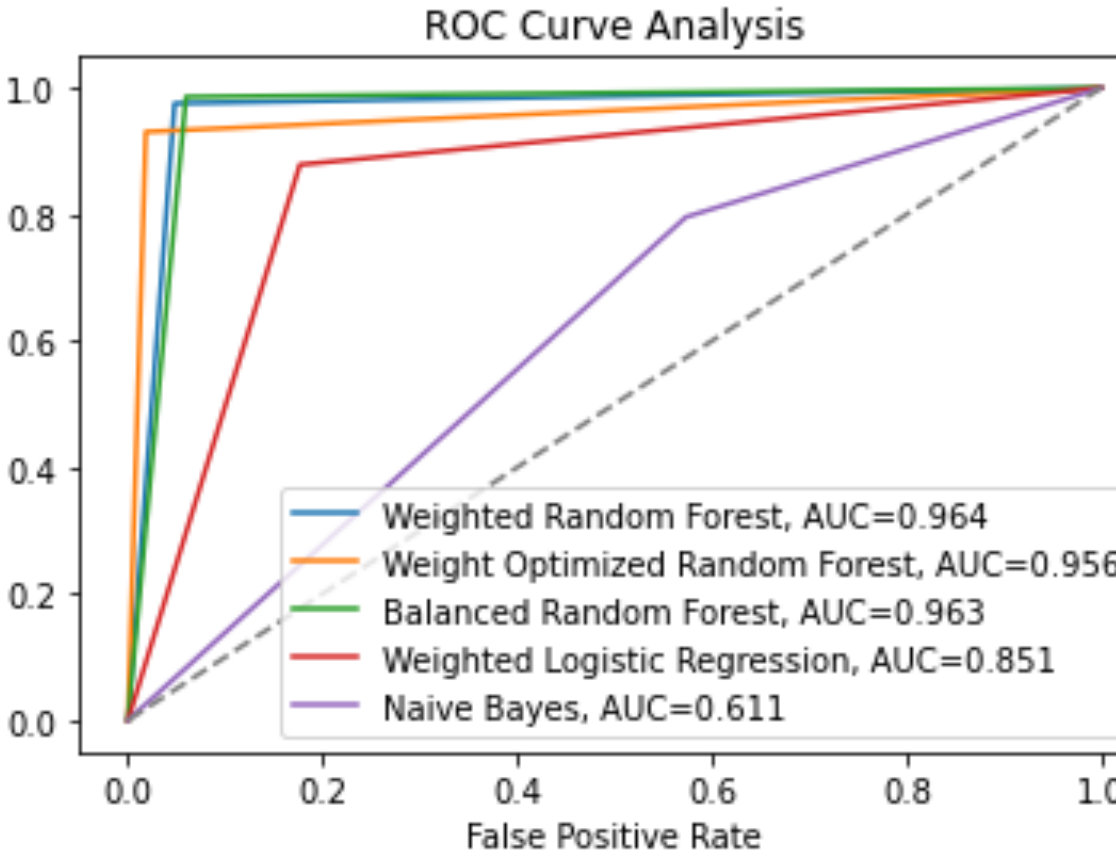
Model Building and Model Comparisons

- Manually-weighted random forest
- Optimally-weighted random forest via grid search
- Balanced random forest
- Weighted logistic regression
- Naive Bayes classifier



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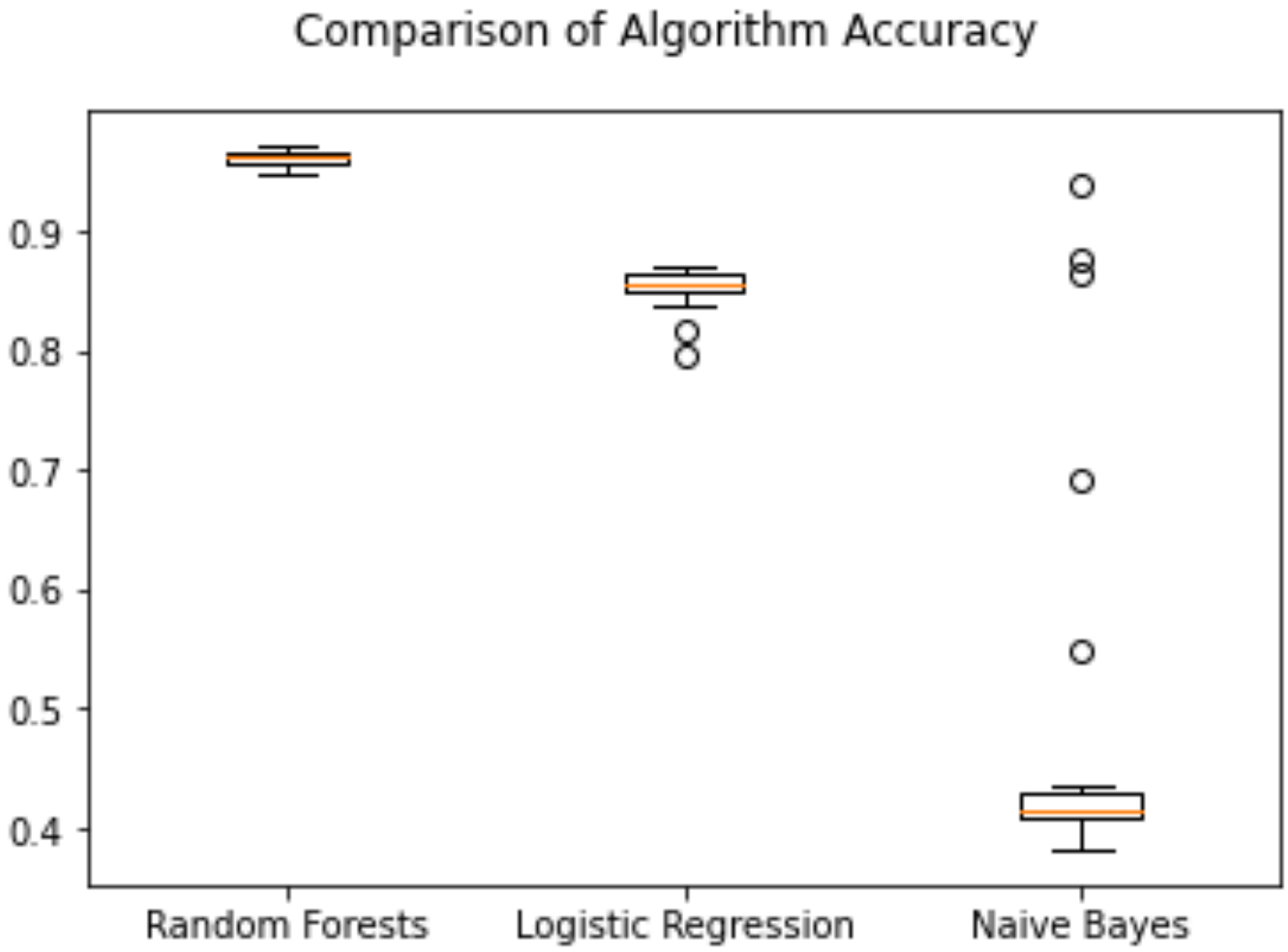
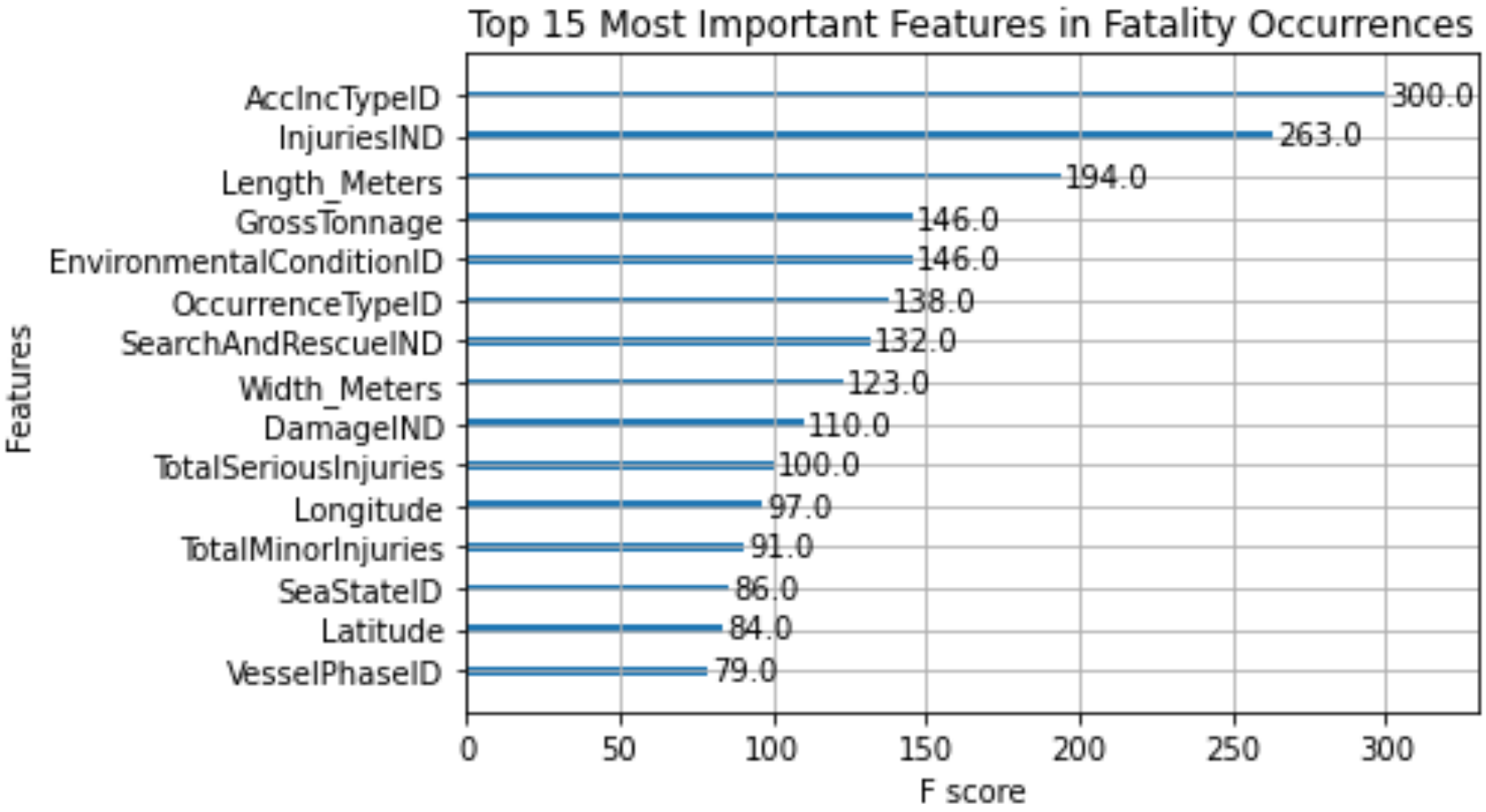


Final comparison of accuracy scores pertaining to each predictive model family.



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Happy to answer any questions. Thank you!

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