M6 Project

Johnathan Wang, Nicholas Charles Vitellaro, Makenna Shae Owens, and Marc Mahanna   
COSC523: Artificial Intelligence, November 10, 2023

***Abstract* - This project focuses on use machine learning approaches to implement models predicting which passengers survive the Titanic shipwreck. The format of this project is that of a Kaggle competition** [1]**. Goals of this project are to: 1) implement a baseline score and 2) try to improve on the baseline score.**

**DESIGN CHOICES AND IMPLEMENTATION**

The approach selected was to implement a baseline and two additional models to improve score beyond the baseline. The three models selected were: 1) Random Forrest Tree 2) Neural Network and 3) Gradient Boost Classifier. 1) is the default implementation provided in the Kaggle [1] competition tutorial [2]. For each implementation, data was loaded, data was cleaned, features were explored and selected, models were trained, and test results were produced.

For the first model, Random Forrest Tree the ‘Age’, ‘SibSp’ and ‘Parch’ features were dropped as they scored less than 0.1 on the correlation matrix. Resulting performance when submitted to Kaggle was 0.77511.

For the second model, Neural Network the ‘Name’, ‘Ticket’ and ‘Cabin’ features were dropped ???. Resulting performance when submitted to Kaggle was ???.

For the third model, Gradient Boost Classifier the same features were dropped as were for the first model. Resulting performance when submitted to Kaggle was ???.

**CHALLENGES AND OBSTACLES**

The project group members are familiar with machine learning concepts and have prior experience with all three selected models. Use of standard practices of data exploration, cleaning, and normalization were employed making exploration of model performance achievable. Overall, the project was not fraught with any significant challenges or obstacles.

**SUMMARY**

This project provided the opportunity to compare and contrast the performance of different machine learning models. A consumable data set and a challenge issued in the form of a competition provided an enriching and rewarding experience for the project group.

**REFERENCES**

|  |  |
| --- | --- |
| [1] | "Titanic - Machine Learning from Disaster," [Online]. Available: https://www.kaggle.com/competitions/titanic/overview. |
| [2] | "Titanic Tutorial," [Online]. Available: https://www.kaggle.com/code/alexisbcook/titanic-tutorial. |