

# Predictive Analytics in Advanced eSports

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## Abstract

Utilizing a comprehensive dataset, including player statistics and team performance metrics, I constructed a decision tree classifier to forecast win-loss results. My objective is to gather the predictive accuracy of the model and its potential utility for players and fantasy league players in strategizing and improving gameplay and understanding. First look shows me that the model can be useful in predicting win/losses of games via stats, offering insights that could transform competitive play and decision-making processes in esports and fantasy leagues for all players.

## Introduction

This project revolves around the game “Valorant”. The project will provide predictive analytics by creating a model that will forecast game outcomes and player/team statistics. By understanding and anticipating the dynamics of team and player performances in game; coaches, players, and fantasy league players, will gain significant strategic advantages and enhance players experiences. Hopefully this project will widen the field of esports analytics and allow a wider scope of people to understand and find enjoyment in Valorant and predictive analytics.

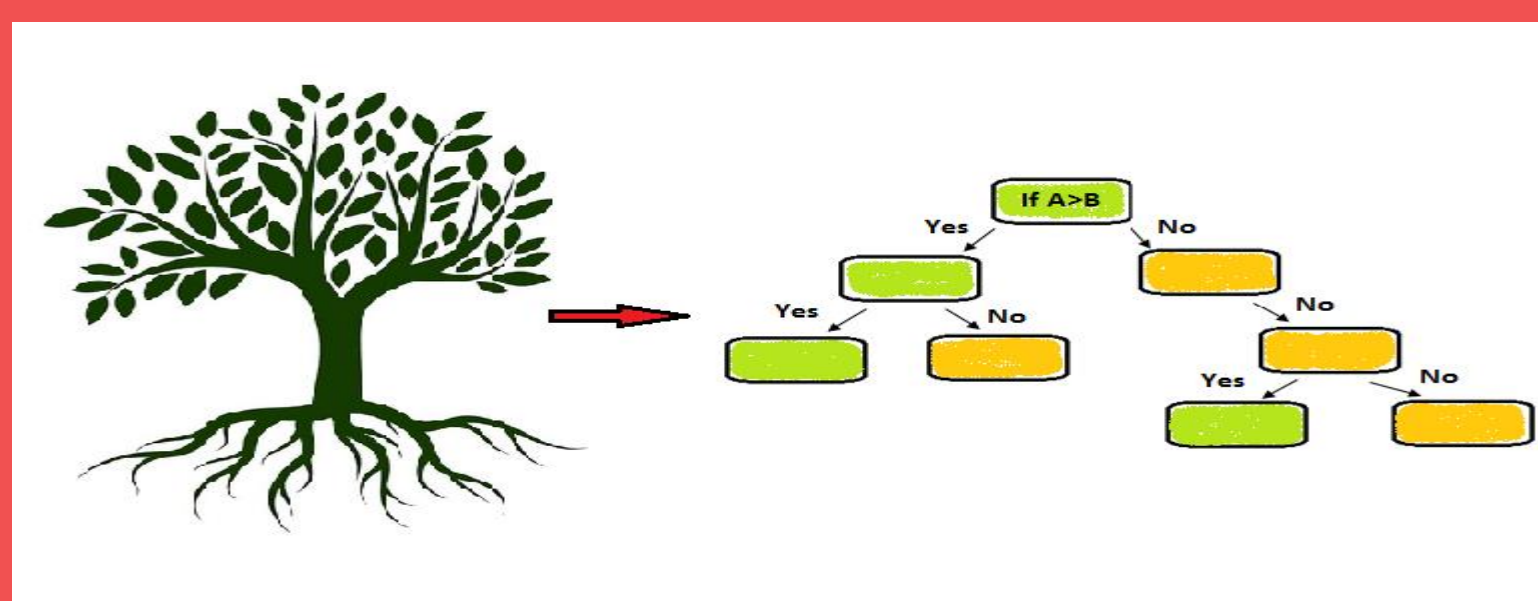


## Objectives

- **Develop a Robust Model:** Create a model that is accurate and reliable when predicting game outcomes and stats
- **Enhance Player and Non-Player understanding of the game:** Allow for people who do or do not play Valorant to understand the game's stats and allow use for playing the game or fantasy league play
- **Improve player training:** Allow stats to be used in order to predict their own stats and see what needs to be improved on
- **Widen viewer engagement in eSports:** Allow for people not involved in VCT and other esports to be able to be engaged and excited to watch online broadcast of professional play.

## Materials & Methods

- Gathered Data via Kaggle Dataset on Professional Valorant eSports.
- Scrubbed/Clean data in order to develop into a model
- Using Decision Tree Models to formulate initial model with predictive win/loss



## Results

```
df[['rating', 'rating-t', 'rating-ct', 'Average combat score', 'kills', 'k-t', 'k-ct', 'deaths', 'd-t', 'd-ct', 'assists', 'a-t', 'a-ct', 'total kills minus deaths', 'tkmd-t', 'tkmd-ct', 'kills assists survive trade perct', 'headshot percentage', 'first kill', 'fk-t', 'fk-ct', 'first death', 'fd-t', 'fd-ct']]
```

```
y = df['Team 1 Win']
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.2, random_state = 42)
regressor=DecisionTreeRegressor(random_state=42)
regressor.fit(X_train,y_train)
```

```
regressor.predict([[1.32,1.21,1.51,267,20,11,9,11,8,3,1,1,0,9,3,6,0.68,160,0.31,1,0,1,1,1,0]])
```

```
regressor.predict([[1.34,1.51,1.314,20,14,6,11,7,4,1,1,0,9,7,2,.61,214,.35,0,0,0,2,1,1]])
```

- Model is Predicting 0 for Loss and 1 for Win
- R-Squared of -.97 and MSE of .69 (Room for improvement)

## Conclusion/Future Works

For this project I will want to further explore options like Random forest models and possibly more to see if other models will give slightly better results that are more trustworthy. This topic of eSports can be expanded upon greatly and really help people who not only play eSports but also watch professional eSports for fun. This can be used in Fantasy leagues and personalized coaching of players and possibly individual coaching in the future.



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## References

- Python (And It's Libraries)
- Microsoft Excel
- Tableau
- Visual Studio Code
- Kaggle Datasets
- GitHub
- GitHub CoPilot & ChatGPT