PlayerUnknown's Battle Ground Placement Prediction

by: Haolin Xiong

The Game

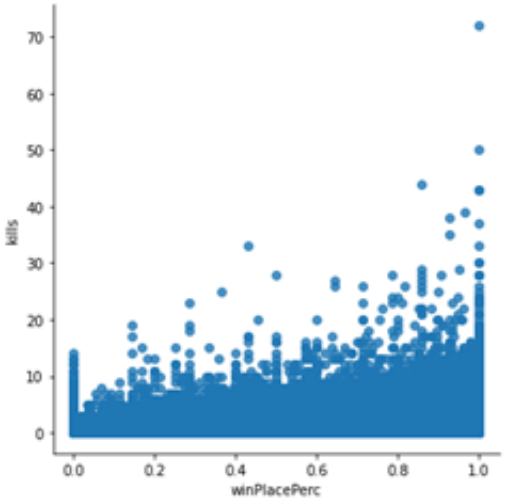
- 100 players are put in the same map
- Players search for weapons and other resources that randomly spawn in the map
- Moving range of the Players will shrink as time progresses
- Players try to kill each other
- Last player/team survived wins

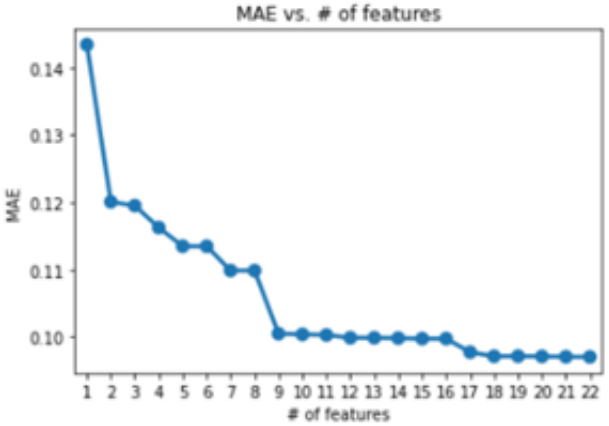
The Dataset

- 4446966 player history
- 28 features including:
  - Player information: player ID, group ID, match ID
  - Game statistics: kills, damage dealt, walk distance, etc
- A target variable 'winPlacePerc' - the player's percentile placement in the match
  - 0: last place, 1: first place
- Train models with the feature and to predict the target
- Goal: to achieve the lowest Mean Absolute Error

EDA

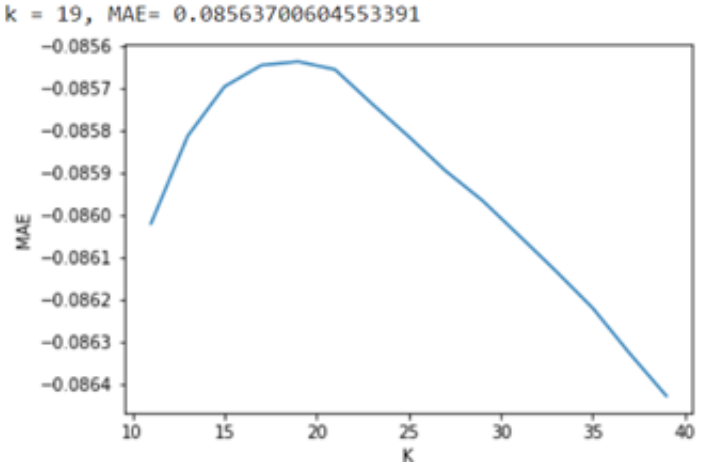
- Cheaters(kills $>$ 20) are very likely to win
- Run linear regressions to find the most correlated features
- Top 9 features: `'walkDistance', 'killPlace'(neg), 'boosts', 'weaponsAcquired', 'damageDealt','heals','kills','longestKill','killStreaks'`





Models

- 1:3 train test split stratified by Match ID
- Random Forest: max_depth= 5, n_estimators = 100
- XGBoost: max_depth= 5, n_estimators = 100, booster: gblinear
- KNN: 5-fold cross validation, k = 19
- Neural Net: “adam” optimizer, 10 epochs
  - Sequential net,
  - 2 “relu” layers,
  - 1 “sigmoid” hidden layer



Accuracy with/without cheaters

- Note: for “Without cheaters”models, placement predictions for players with kills＞20 are manually set to 1.0

Table1. MAE for the models

	With cheaters	Without cheaters
Random Forest Regressor	0.0876	0.0873
XGBoost Regressor	0.0738	0.0726
KNN Regressor	0.0856	
Sequential Neural Network	0.0744	0.0730

One Step Further- Exclude Pro teams

- Create features: “groupkills” - aggregating kills by groups
- Note: for “W/O cheater or pro”models, placement predictions for players with groupkills>30 are manually set to 1.0

Table2. Updated MAE Table

	With cheaters	Without cheaters	W/O cheater or pro
Random Forest Regressor	0.0876	0.0873	0.0873
XGBoost Regressor	0.0738	0.0728	0.0726
KNN Regressor	0.0856		
Sequential Neural Network	0.0744	0.07388	0.0730

Conclusion and Insights

- XGBoost scores better than Sequential Neural Network.
- Neural Network is the fastest, KNN is the slowest
- Eliminating cheaters improved the models by about 1.3%, wheras excluding pros does not bring significant improvements
- All models suggest that:

If you want to win, try to **move** more, **kill** more, and pick up more **boost items**.

Thank you for listening!