Predicting Skill Level of Player based on Actions

Using Recorded Matches of Counter Strike: Global Offensive Games

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Business Understanding

In this game the player will be match according to their **rank**, new player don't have a rank when they start playing.

To provide the best challenging experience for new and old players is necessary to get the new players rank as quick as possible to let them play against player of the same skill level.

Data Understanding

The dataset is composed of about 1 million entries and 33 attributes we are going to use 5 of them.

- hp_dmg
- hitbox
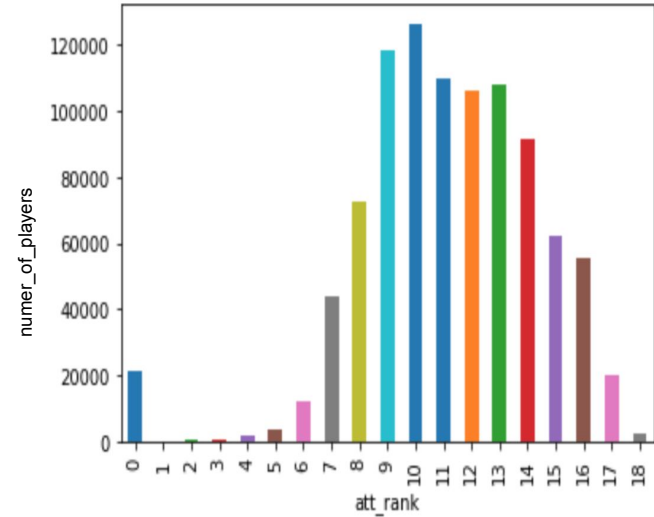- att_rank
- vic_rank
- avg_match_rank
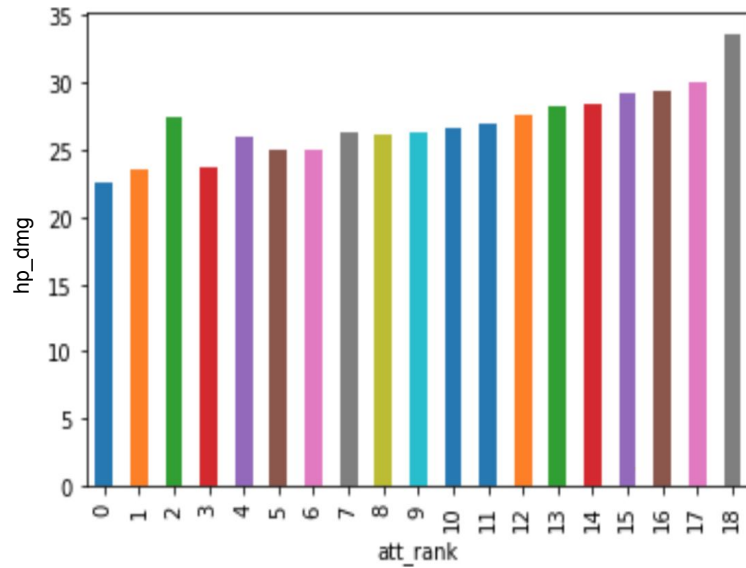
Data Preparation

- Conversion of categories of text values to numbers

- Normalization of all values

- Data randomization

KNN

- Accuracy of 42% when trying to classify all 19 ranks

- Reducing output classes to three (low, mid and high level) ranks --> accuracy is now 84%

Neural Network

- Keras and Tensorflow
- Feedforward Network
- 4 Layers, 2 Hidden Layers
- 10-Fold Cross-Validation
- Trained on 700'000 Instances ~12 minutes
- ~84% Accuracy

input layer

hidden layer 1   hidden layer 2

output layer
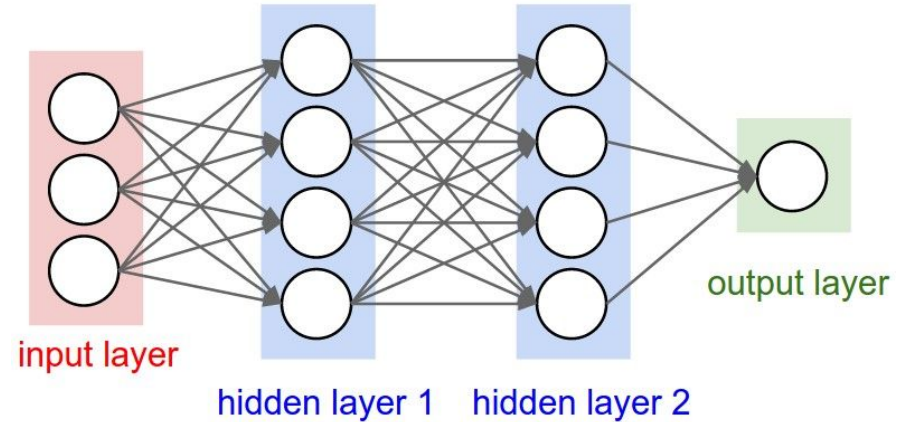
Conclusion

- Most of the data has bad or no correlation to the player rank
- About the same accuracy with KNN and neural network
- Neural network takes more time for the training but is more faster for the prediction and this is what we want for evaluate new players.
- Reducing output classes improved accuracy while still being valid for the business case

Sources

https://cs231n.github.io/neural-networks-1/