

# D&D Challenge Rating Prediction & Calculation

By Jocelyn Fisher



# Key Info

In D&D, every creature (including player characters and Monsters) has an ability score for each stat, and this determines a modifier, a number that you add or subtract to all kinds of dice rolls and actions.

Each character or Monster can be officially sourced from the Dungeon & Dragons rule books, or the players may create their own - known as Home-brew.



# Summary

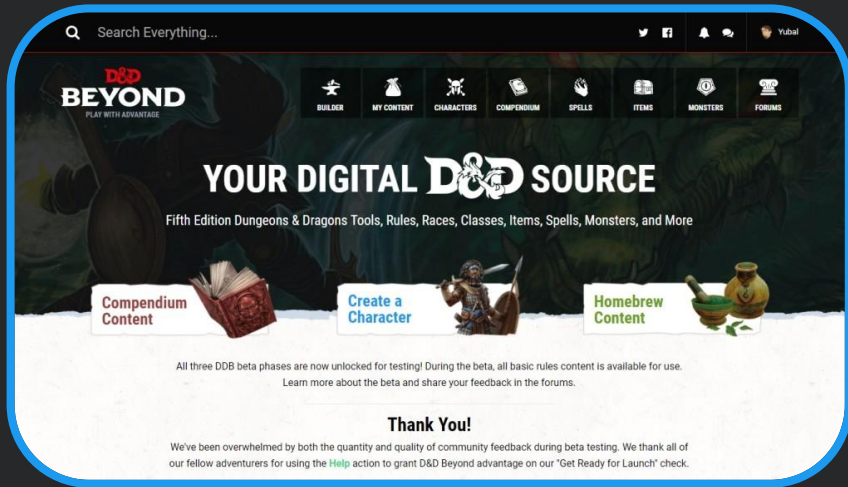
This project uses an iterative approach to Regression Modelling in order to understand how a Dungeon & Dragons Monster stats may effect its Challenge Rating (CR). D&D Beyond can use this Prediction Model to calculate the CR of any Home-brew Monster while successfully accounting for the variance of 91% of the model.

# Outline



- **Business Problem**
- **Data**
- **Methods**
- **Results**
- **Conclusions**

# Business Problem



- Missing Tool to predict/calculate the Challenge Rating of Home-brew Monsters
- Correlation of what dictates CR is mostly unknown to the player base
- Increasing popularity and possible influx of new players

# The Data

The data sourced for this regression analysis comes from Kaggle, which has been API scraped from an online version of the Official 5th Edition Dungeon & Dragons Compendium.

- 762 different D&D Monsters
- 53 columns of stats
- Action and Attack abilities





# The Methods

Through various visualisations and Linear Regression Analysis, the project went through five total iterations, including the simple base model.

These versions tackled issues including:

1. Identifying different types of Categorical data
2. Appropriate transformation of variables
3. Utilising selector functions



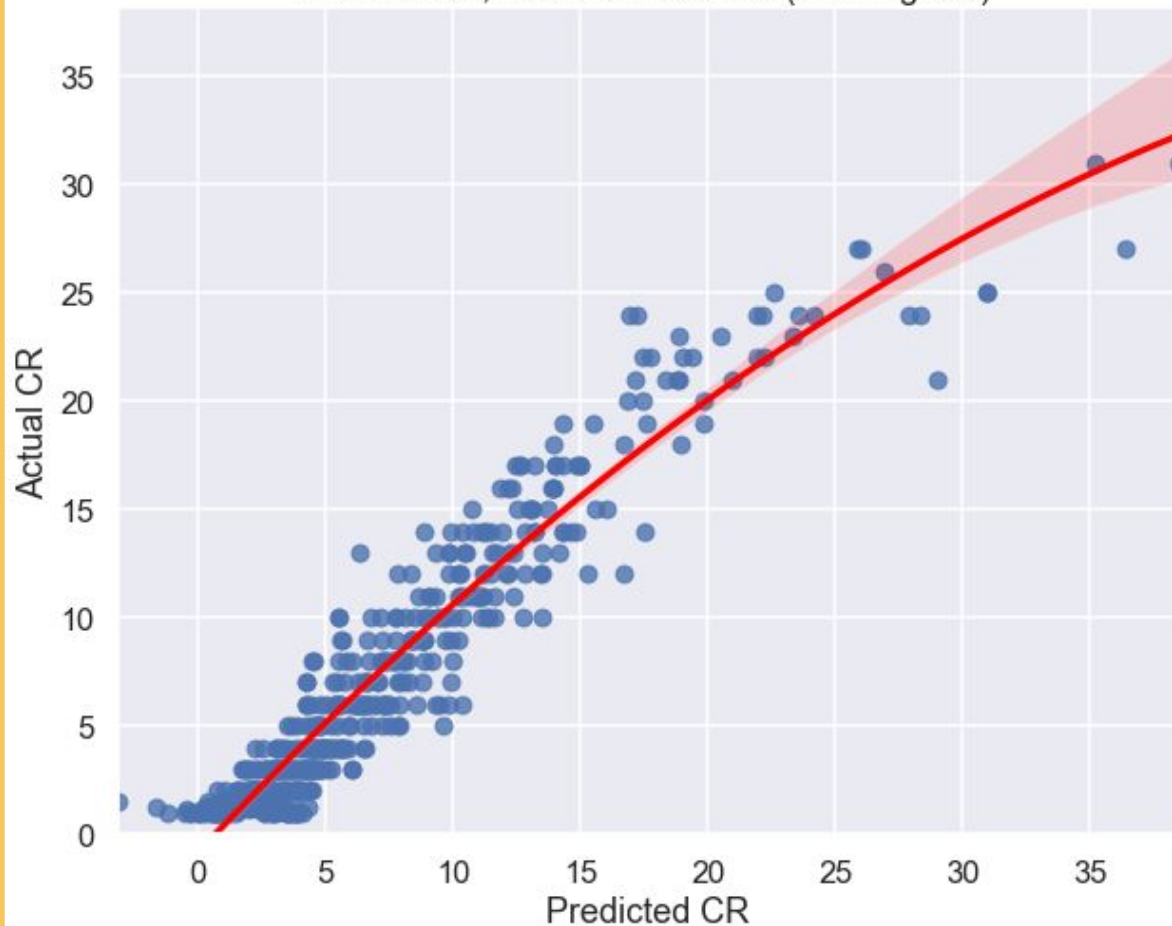
# The Results

This regression analysis can successfully account for 91% of the models variance.



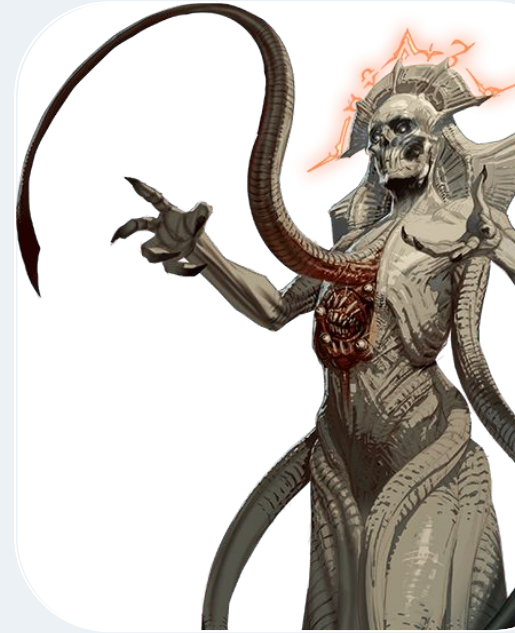


Final Model, Actual v Predicted (Training Set)

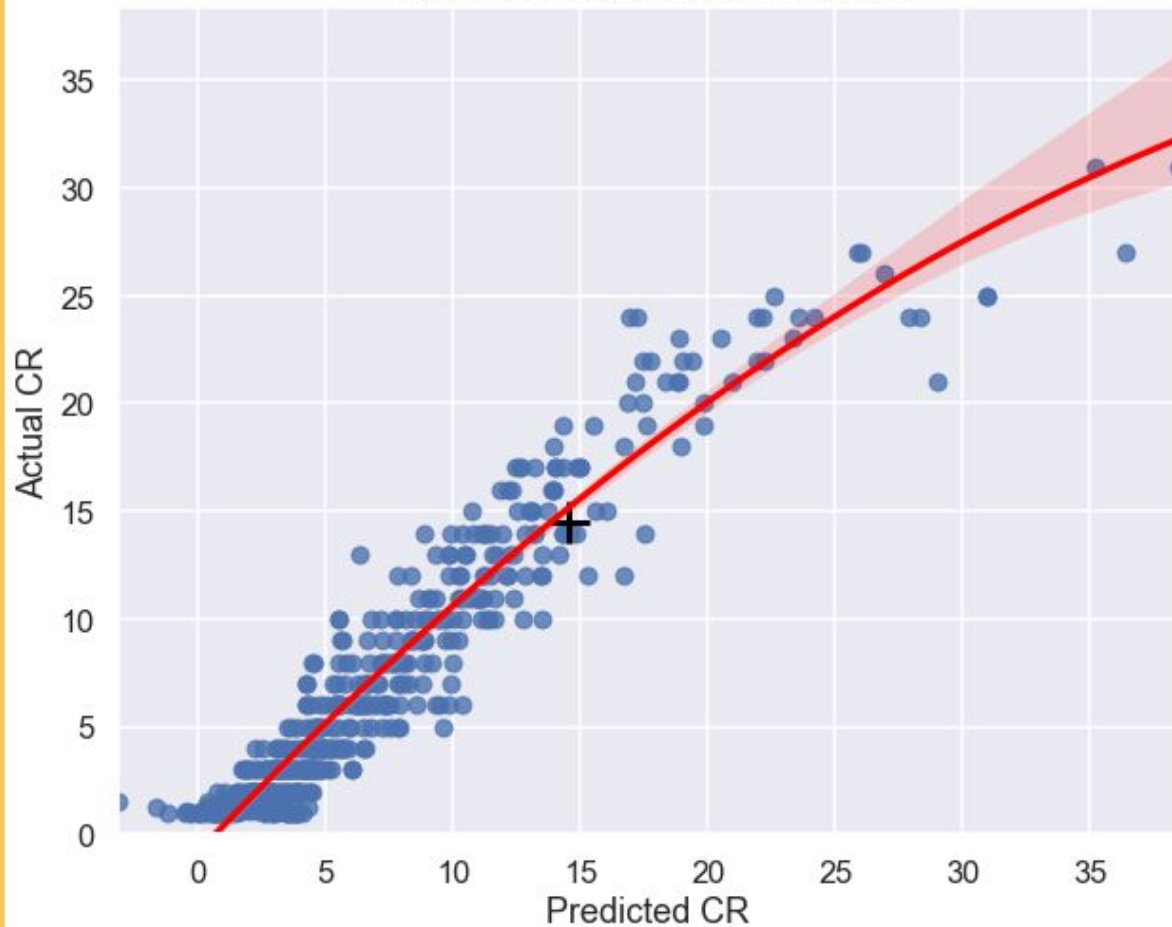


# Top 10

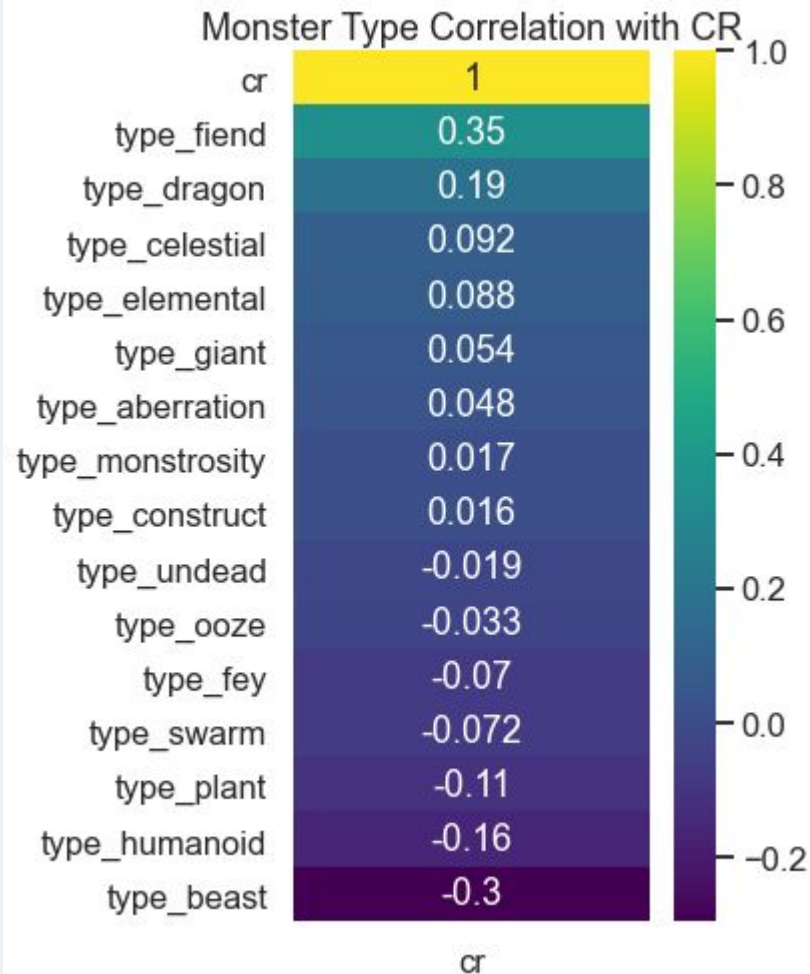
1. Health
2. Intelligence
3. Charisma
4. Armor Class
5. Constitution
6. Strength
7. Wisdom
8. Dexterity
9. The Multiattack ability
10. Speed



Predicted Y for Homebrew Monster



# Monster Type



# Conclusions

D&D Beyond may use this prediction model to implement a Challenge Rating Calculator for their Monster Creation Tool, and make it available to the online platform players.

- Highly correlated stats to CR are now revealed
- Further analysis could prove useful into the Fiend Monster Type
- Resistance & Immunity data to collate
- The model can be used as more D&D Monsters are released

# Thank You!

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