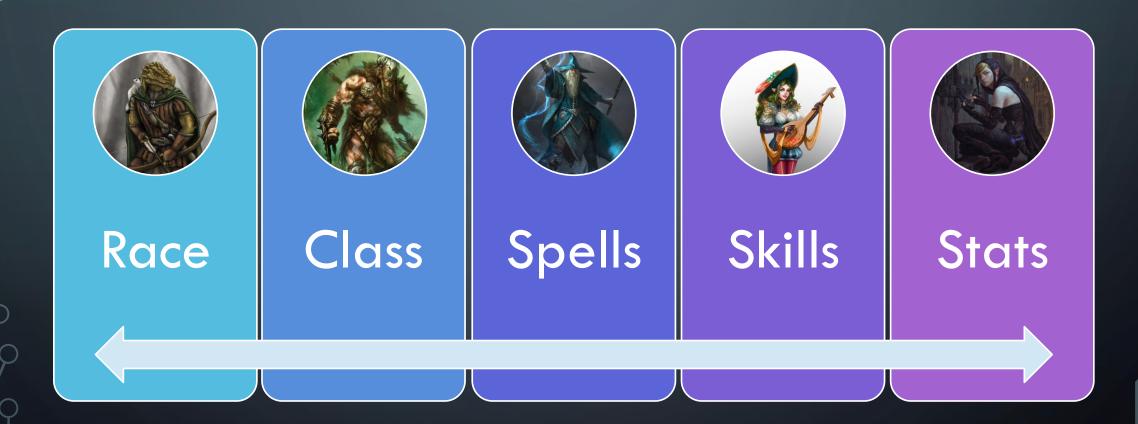
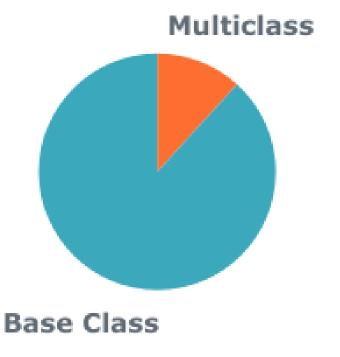


CHARACTER CREATION



Character Class Types

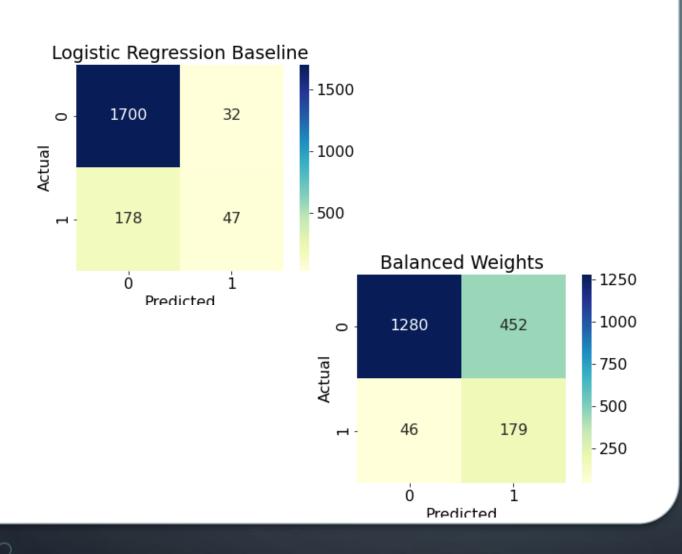


MULTICLASSING IN DND

- When leveling up, can choose to "take a level" in a different class to gain different abilities.
- Method of character optimization
 - Not always better
- Complicated
- Novel story ideas

DND CHARACTER SHEET DATASET AND TOOLS

- From B. Ogan Mancarci's printSheetApp and interactive Sheet (Online character sheet tools)
 - Features include HP, AC, level, skills, weapons, race, spells, ability scores, class
- Homebrew (non-standard data)
- Free text fields:
 - Spells, Weapons, Alignment
- Logistic Regression focus
- Tools:
 - Tableau, Matplotlib, Seaborn
 - Pandas, NumPy
 - Scikit-learn



CONFUSION MATRICES

- Severe class imbalance so accuracy is deceiving
 - Baseline: 0.893
 - Balanced Weights: 0.746
- Increase correct + class guess
- Increase in false positives
- Decrease in false negatives

ROC curve for Multiclass Character Prediction 1.0 0.8 True positive rate .0 .0 .0 0.2 Logistic Regression Balanced Weights Logistic Regression 0.0 0.0 0.2 0.6 0.8 0.4 1.0 False positive rate

LOGISTIC REGRESSION STATS

Model	Precision	Recall	F-1 Score	ROC AUC
Baseline	0.595	0.209	0.309	0.595
Balanced Weights	0.284	0.796	0.418	0.767

Feature Importances HΡ HP per lvl num_spells Spells per lvl Cha Wis Str Dex Con Feats_per_lvl num feats 1-3 Perception Stealth Survival Acrobatics Insight Persuasion 0.00 0.02 0.04 0.06 0.08 Relative Importance

FEATURE IMPORTANCE

- Engineered features
- Character stats had a large impact
- Skills, levels
- More engineered features could improve performance.

SOURCES/ ACKNOWLEDGEMENTS

- Gary Gygax and Dave Arneson for creating DnD.
- Wizards of the Coast (subsidary of Hasbro) which publishes DnD guides.
- B. Ogan Mancarci for his data collection.
 - https://github.com/oganm/dnddata
- Dan Quach for his 2020 blogpost about creating a classifier using Oganm's dataset.
 - https://towardsdatascience.com/classifying-character-classes-in-dungeons-dragons-with-machine-learning-86751240594d



ANY QUESTIONS?

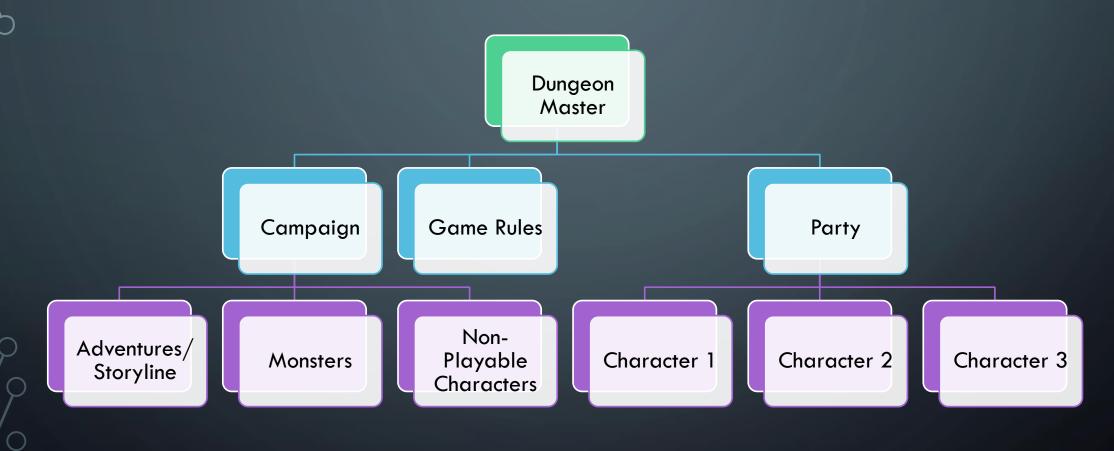
Ranger Paladin (Scout, Hunter, (Holy Tracking, Warrior) CHARACTER CLASS Survival) Half-Caster Barbarian Rogue (Primal, Rage, (Stealthy, No combat Assassin, Thief) training) Druid Sorcerer (Born with (Naturebased magic power) **Fighter** Monk Cleric (All-around Warlock (Martial (Healer, gains combat Given power Artist) magic via expert) via a pact) Martial deity) Bard Wizard Caster (Minstrel, casts (Scholarly, spells with Caster) music)

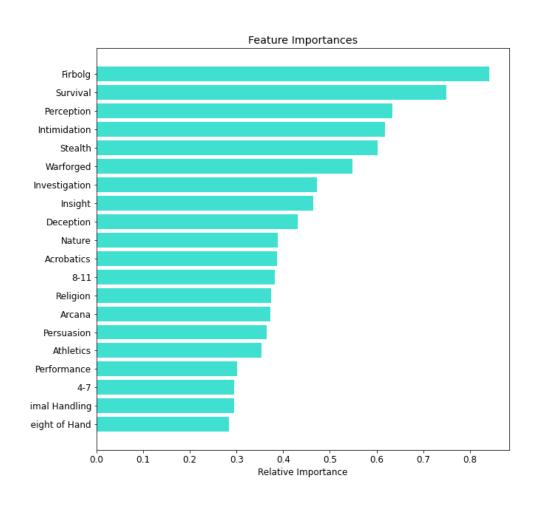
Level Dist for Charcters 4000-3500-3000-1500-1000-500-

FEATURE ENGINEERING

- Normalize to level since data skewed to lowerlevel characters.
 - HP/level
 - Spells/level
 - Feats/level
- Weapon categories: martial, simple, ranged.
- One-hot encoding skills, race/ other race group, casting stat, level groups

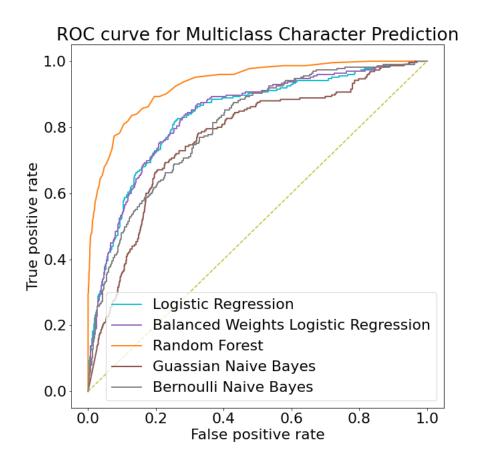
DUNGEONS AND DRAGONS (DND) EXPLAINED





FEATURE IMPORTANCE

- Skills, levels
- More engineered features could improve performance.



ROC CURVE FOR ALL MODELS