

Gaming Score Forecasting Model

Improving Video Game Development

- 01 
Metacritic scores
Identifying score trends and patterns in the video game industry to guide predictive strategies.
- 02 
Game Features
Exploring data on previous game releases to identify which specific features (or lack thereof) predict if the game will be well-received.
- 03 
Game Features
 - Developer
 - Publisher
 - Game
 - Platform brand (Microsoft, Sony, Microsoft, PC)
 - Platform type (Home Console, Handheld, PC)



By: Benjamin Lavoie

Introduction

According to Statista, video games are the most lucrative entertainment industry.

As a video game fan, it made me wonder:

Can video game ratings be predicted before release?

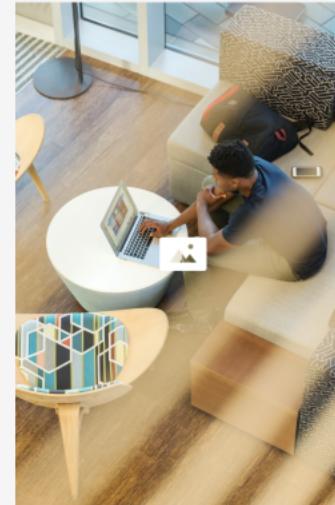


Video game predictions

I think they can.

Who could benefit from that?

- Indie developers
- Solo developers
- Game studio of any size
- Any curious video game fan



Based on what data?

2 main datapoints:

1. Metacritic reviewer scores
2. Game features

Datasets source : Metacritic website directly

Around 14000 rows (all the video game ratings on MetaCritic website)

Target column: Metascore Range

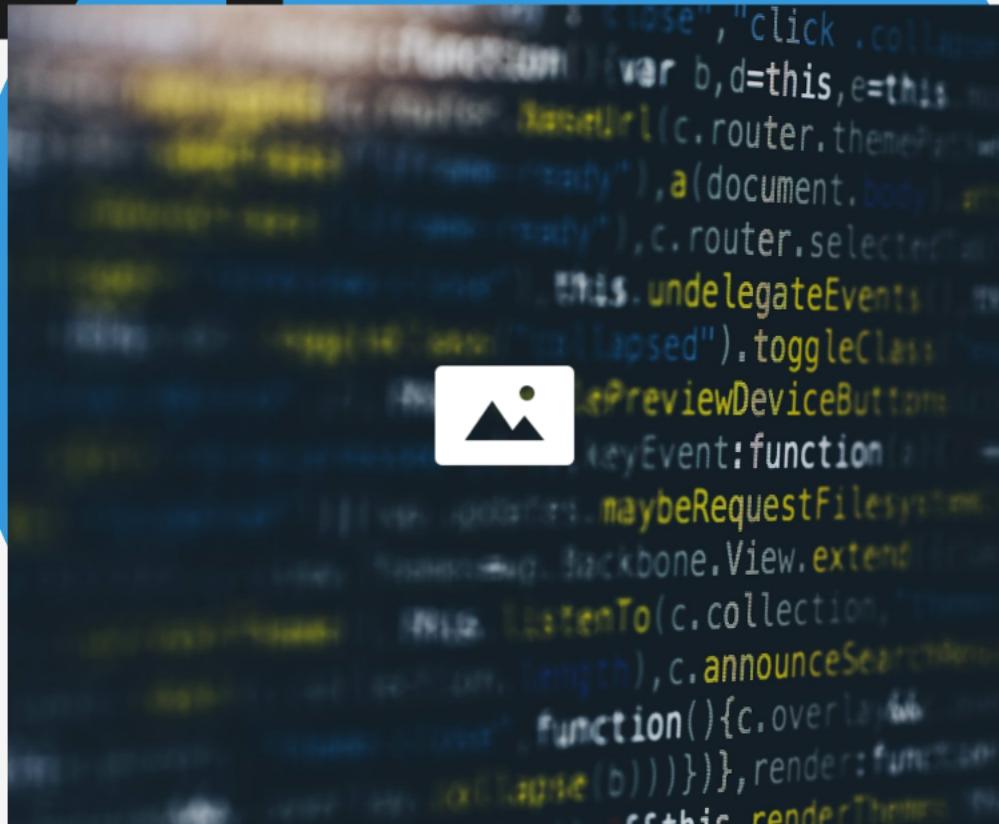
Weak: 0-68

Okay: 69-78

Strong 79-100



01



Metacritic scores

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predictive strategies

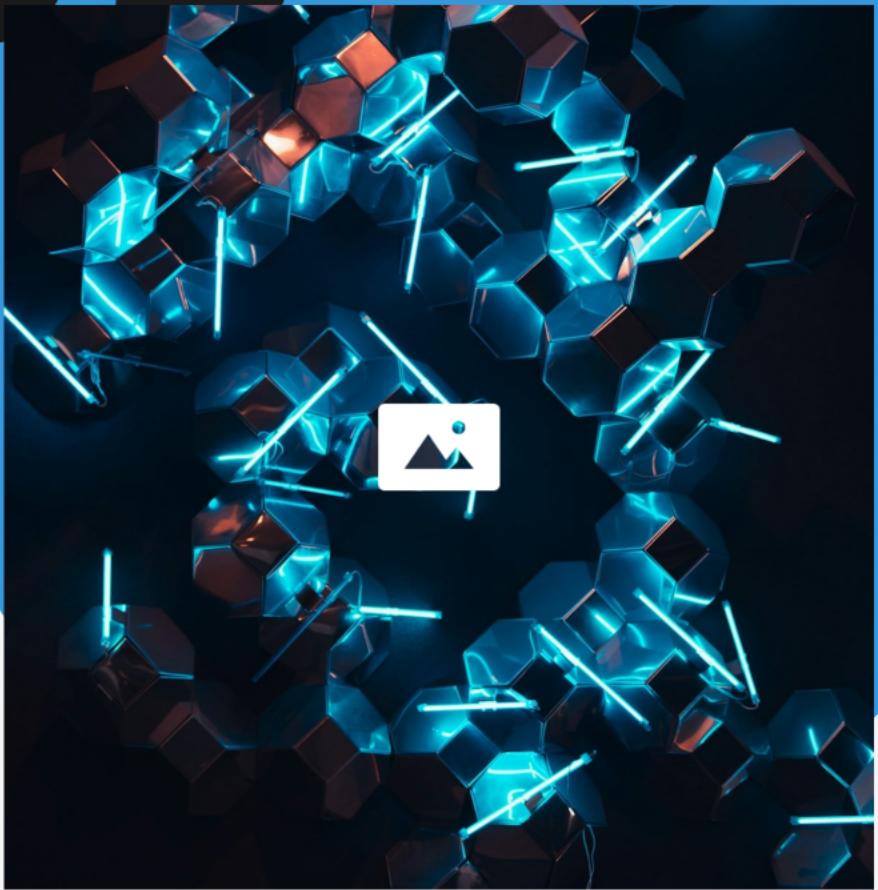
02



Game features

Exploring data on previous game ratings and evaluating games with similar features to predict if the game will be well-received.

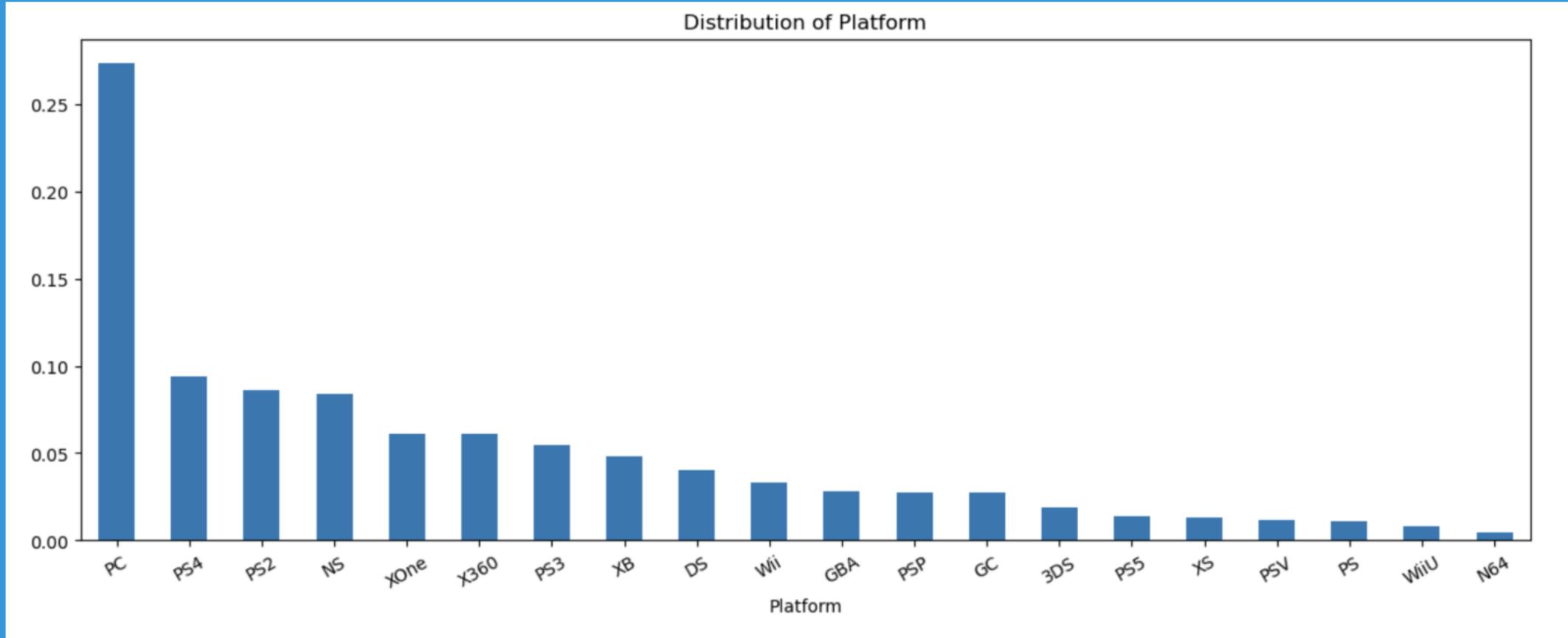
03



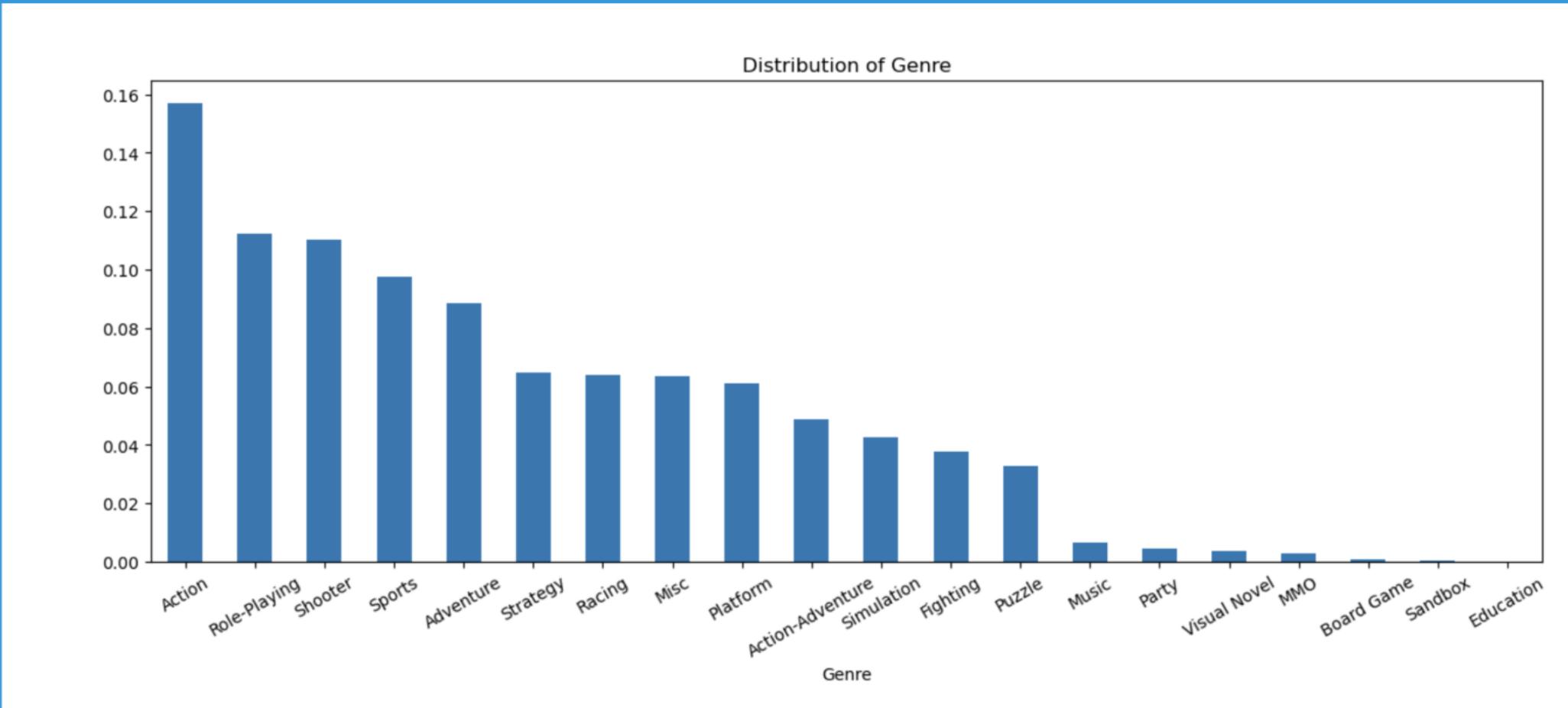
Game features

- Developer
- Publisher
- Genre
- Platform brand (Nintendo, Sony, Microsoft, PC)
- Platform type (Home Console, Handheld, PC)

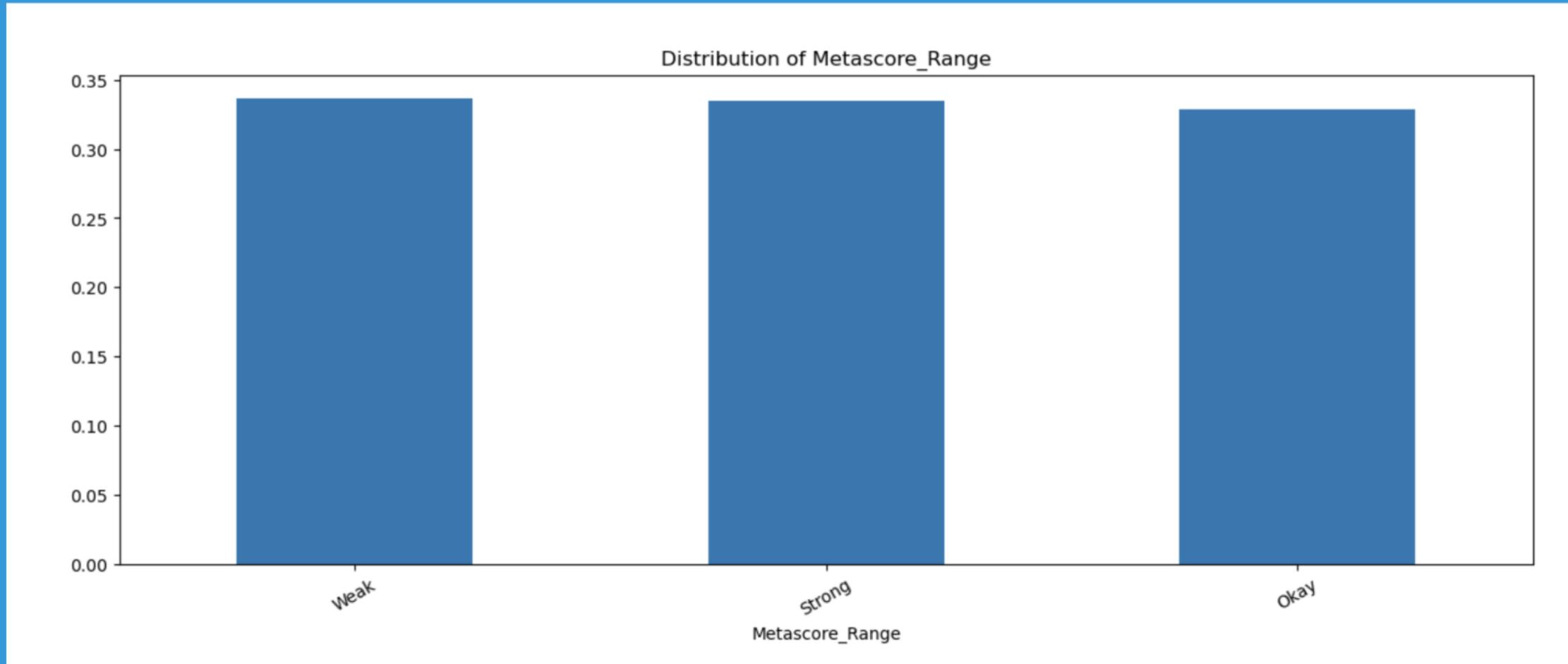
As for now, here are my findings



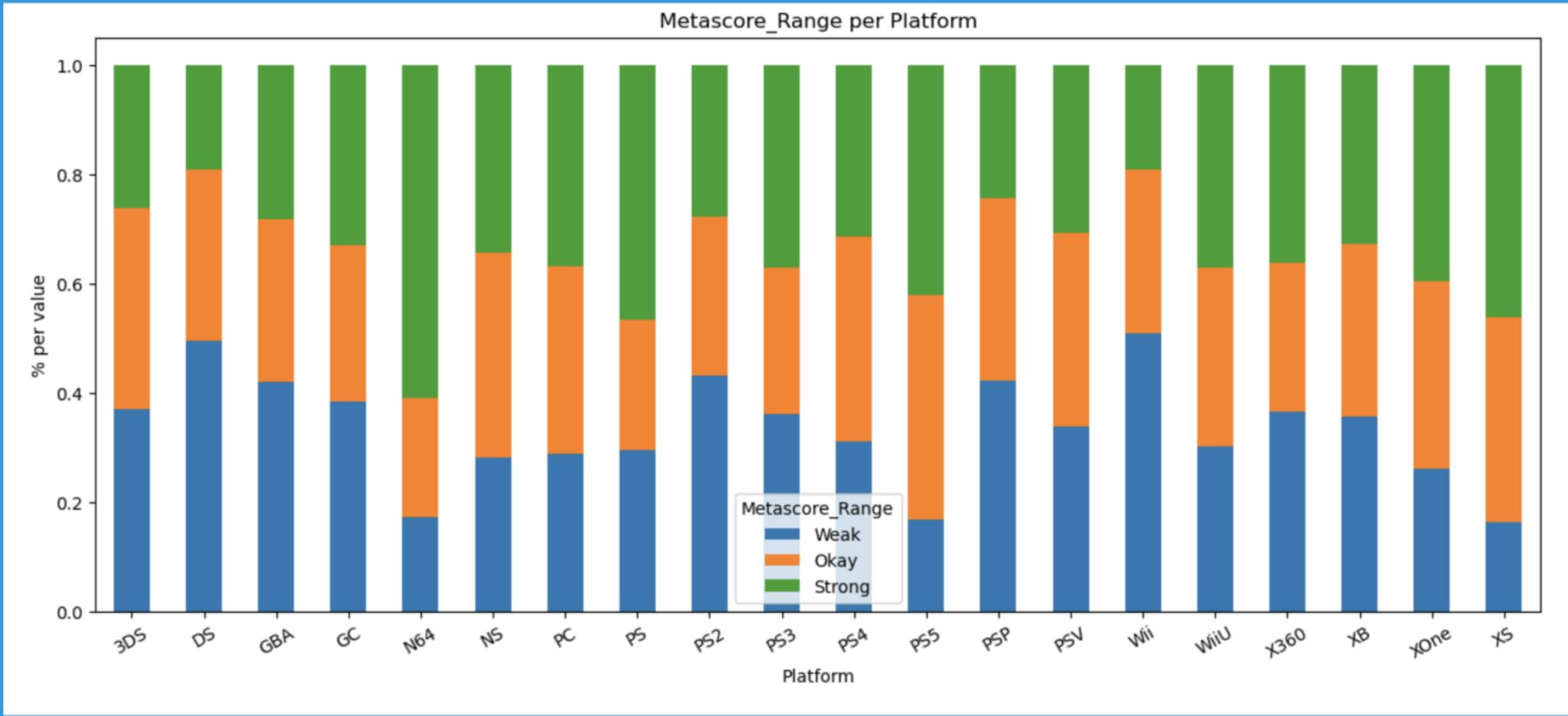
**- Mostly PC, not too many recent consoles because
data is up to the beginning of 2023**



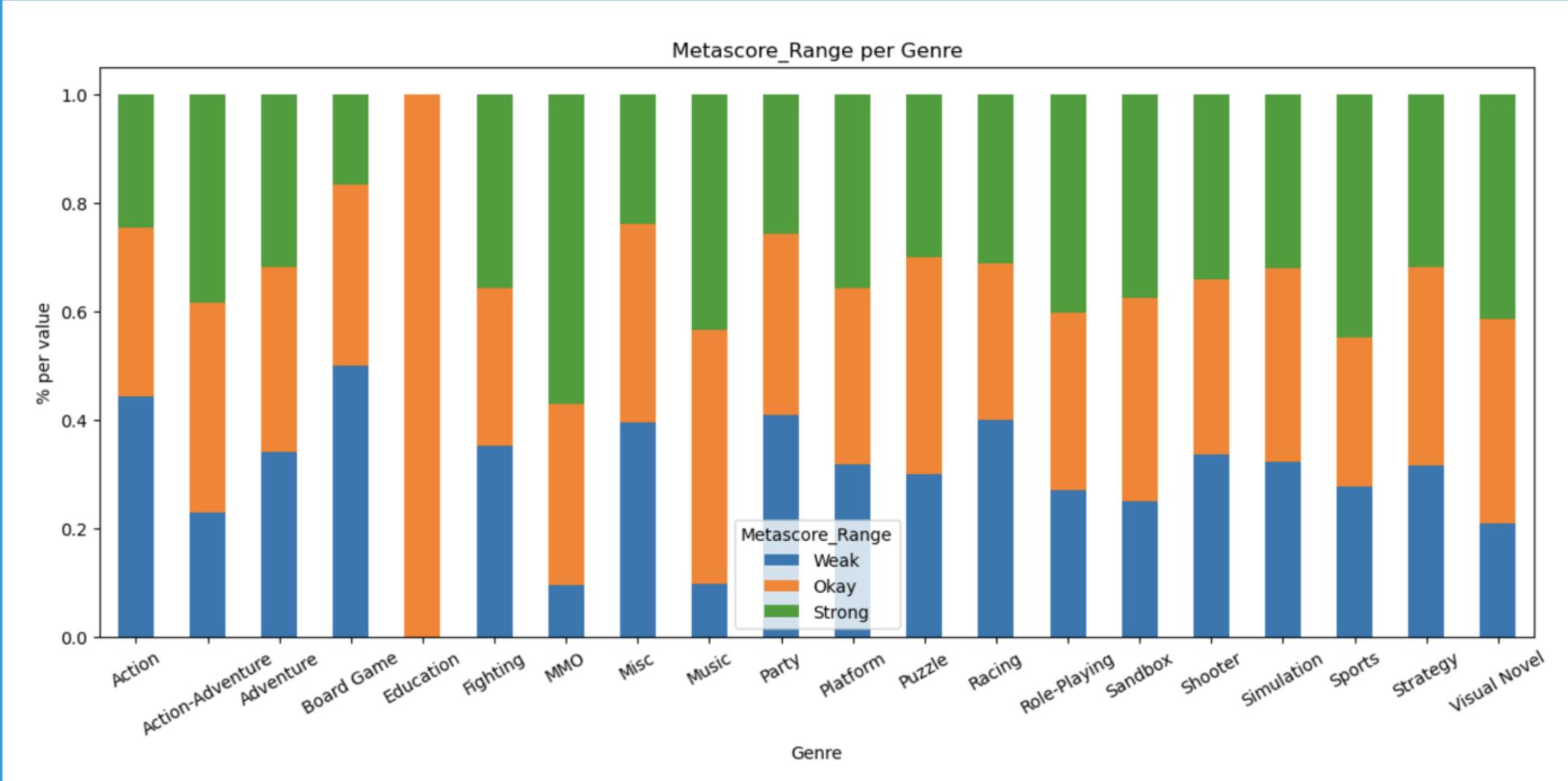
- A lot of action, role-playing and shooter games
- Only a few BoardGame, Sandbox and Education games



Target column: Metascore_range
Weak, Okay, Strong



N64 had a lot of Strong-rated games.
Wii had a lot of Weak-rated games.
Current platforms, PS5 and Xbox Series, has very few “okay” games.
For the rest, relatively similar.



- **Education:** No weak, no strong, only Okay-rated games. But after verification, there is only 1 game in this category.
 - MMO, almost no Weak games and a lot of Strong games.
 - Board game, not a lot of strong games, a lot of okay games.

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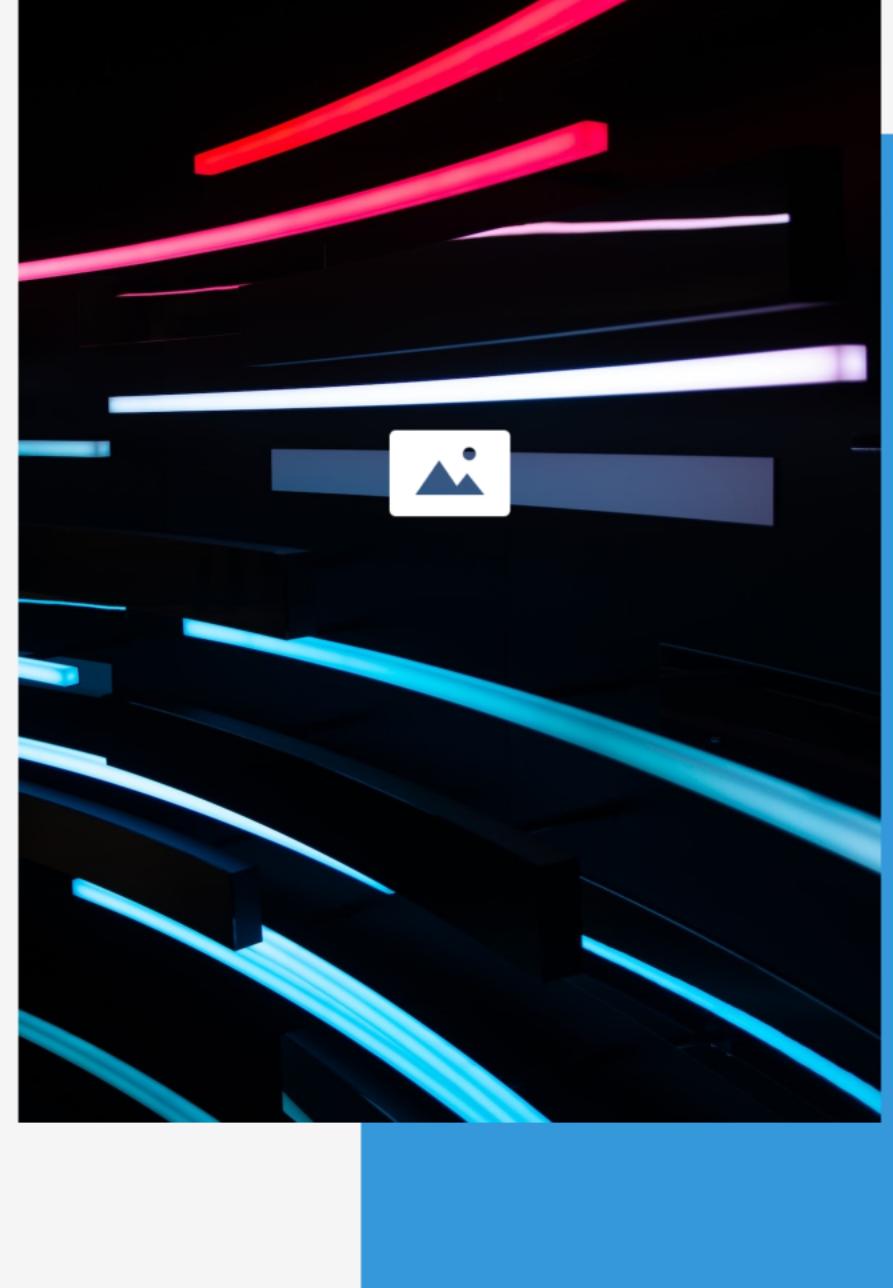
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Sprint 2 Modeling:

I tried a lot of simples models, and here are the results:

	score
Baseline log reg : C=1.0	0.520
pipeline_test:	0.520
RandomForestClassifier:	0.440
AdaBoost:	0.454
Random Forest:	0.565
XG Boost:	0.567
NN Boost:	0.509
DecisionTreeClassifier:	0.496
BaggingClassifier:	0.546
Best XGB Model:	0.569



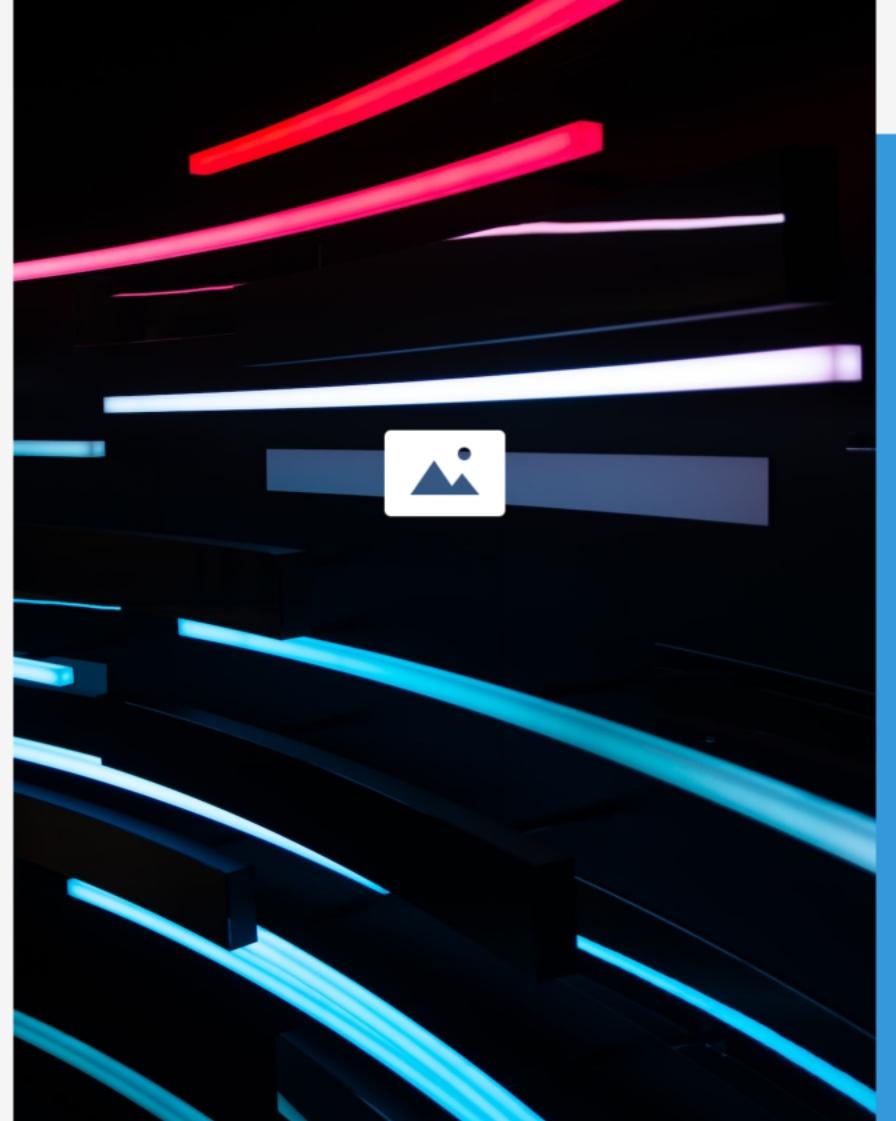
Sprint 3 Modeling:

A lot of crashing (not as much as other people but still) so I just solely focused on XG Boost and I was able to bring the accuracy to...

	score
Baseline log reg : C=1.0	0.553
One-Fold : C=1	0.553
5-Fold : C=1	0.553
pipeline_test:	0.557
AdaBoost:	0.473
Random Forest:	0.438
XG Boost:	0.580
NN Boost:	0.559
DecisionTreeClassifier:	0.488
BaggingClassifier:	0.523
XG Boost, n_estimators=3500, test score:	0.616
XGB pipeline:	0.617

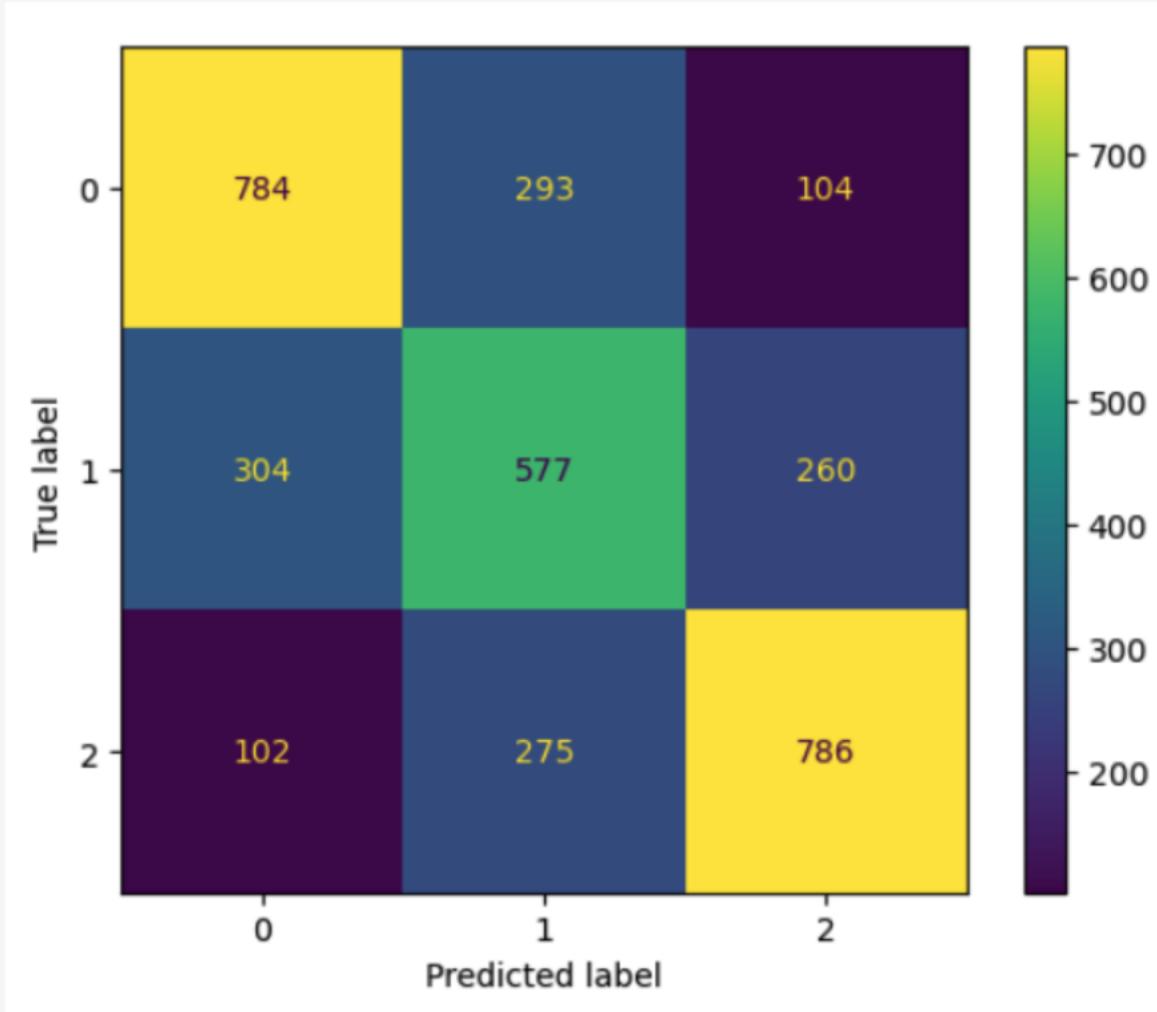
61.6%!

(XGB pipeline had too much overfitting)



Confusion matrix:

Not perfect, good enough



0 (weak) and 2 (strong) are predicted not too bad. But 1 (okay) is around 50%

The accuracy of predicting a 0 (Weak-Rated games) is 66.4%.
The accuracy of predicting a 1 (Okay-Rated games) is 50.6%.
The accuracy of predicting a 2 (Strong-Rated games) is 67.6%.

Next steps:



- (Maybe) Training the model for maximum efficiency, with (maybe) a pipeline to find the best scaler and a lot of grid search and trial and error for the best hyperparameters.
- Hosting the project on a website for easy utilization

Talking about hosting the project...
Feel free to try it out and let me know if
you have any comments!



Conclusion

Accurate prediction models can greatly benefit indie game developers in predicting their games for success. It could also help create hype for Game Companies and Streamer/Youtuber.



(Maybe) I will continue to optimize, but for now, that's enough, I'm burnt out and my computer too.

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