PROJECT 5

BY TEAM 4CME

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PROBLEM STATEMENT/AIM

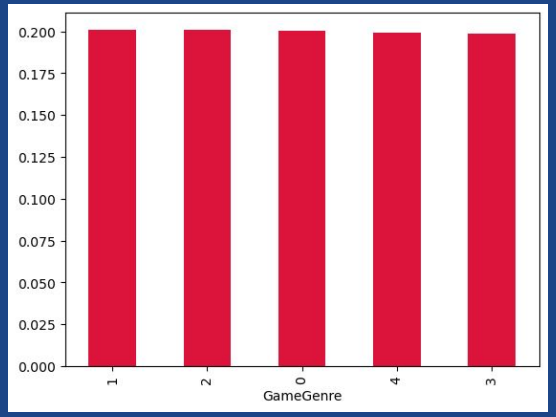
PROBLEM STATEMENT: IS THERE A RELATIONSHIP BETWEEN GAMING HABITS, DEMOGRAPHIC AND GAME GENRE?

BRIEF SUMMARY:

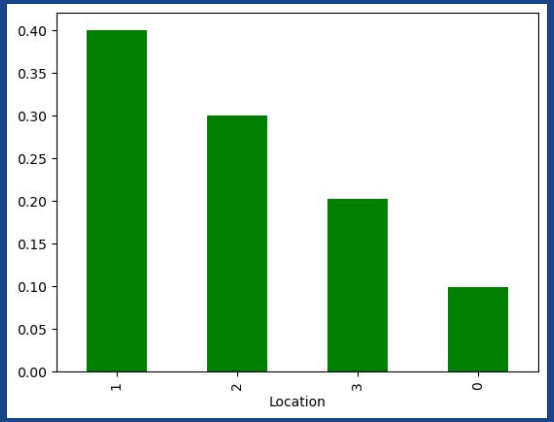
- AIM - TO PREDICT GAME GENRE BY GAMING HABITS AND DEMOGRAPHIC DATA
- HOW: BY BUILDING A MULTI CLASSIFICATION MODEL WE HOPE TO BEAT OUR MODELS BASELINE.
- HYPOTHESIS: WITH A LARGE DATASET AND MANY RELATIONAL VARIABLES WE BELIEVE

01
EDA

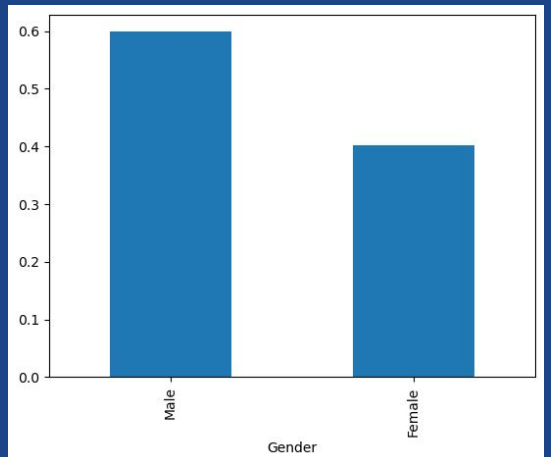
CLEANING THE DATA AND IDENTIFYING BIAS



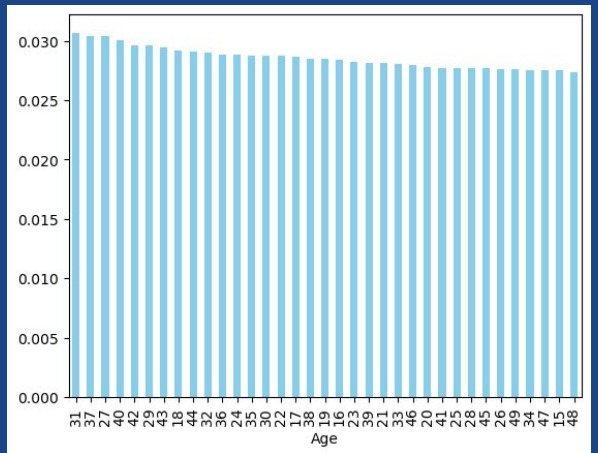
Game Genre:
0 - Strategy
1 - Sports
2 - Action
3 - RPG
4 - Simulation



Location:
0 - Other
1 - USA
2 - Europe
3 - Asia



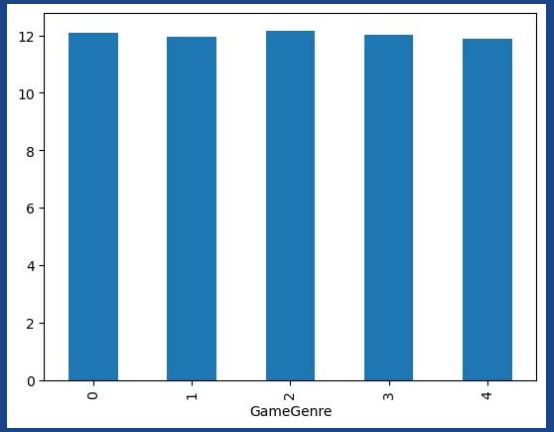
Gender Ratio



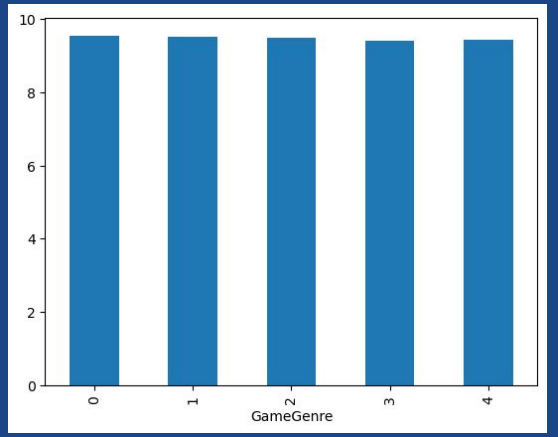
Age Split

EXPLORING TRENDS, or lack thereof...

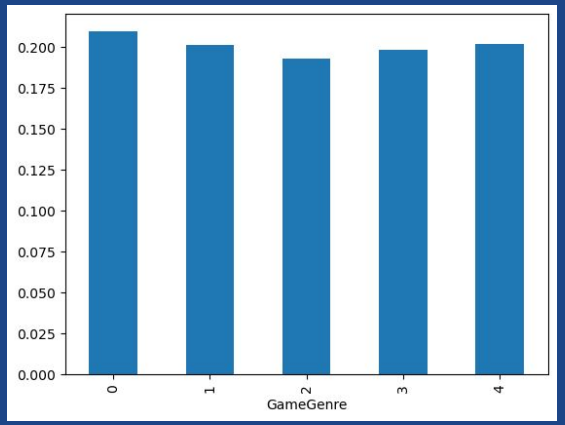
Play Time Hours



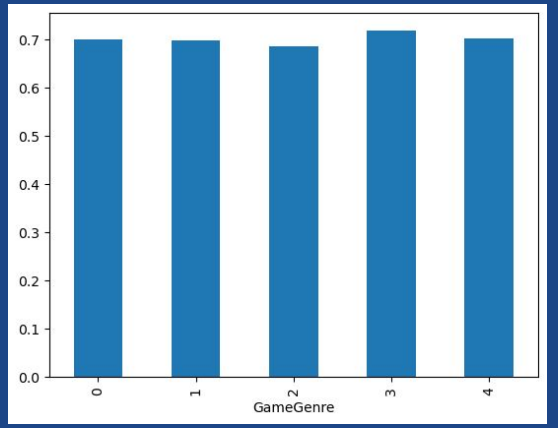
Sessions per Week

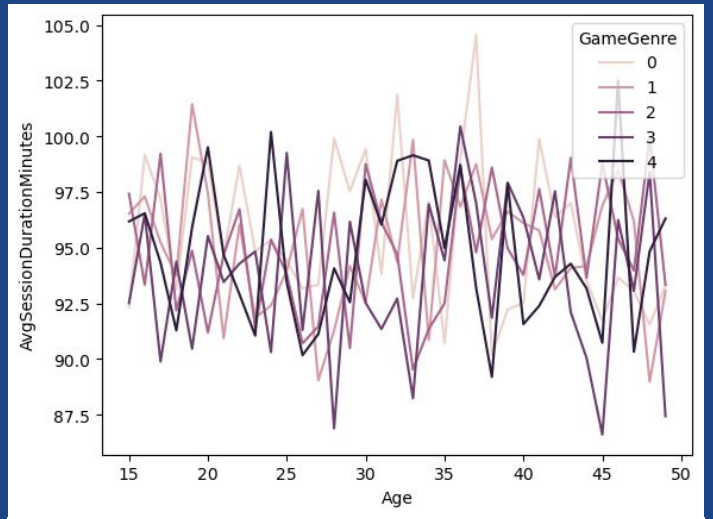


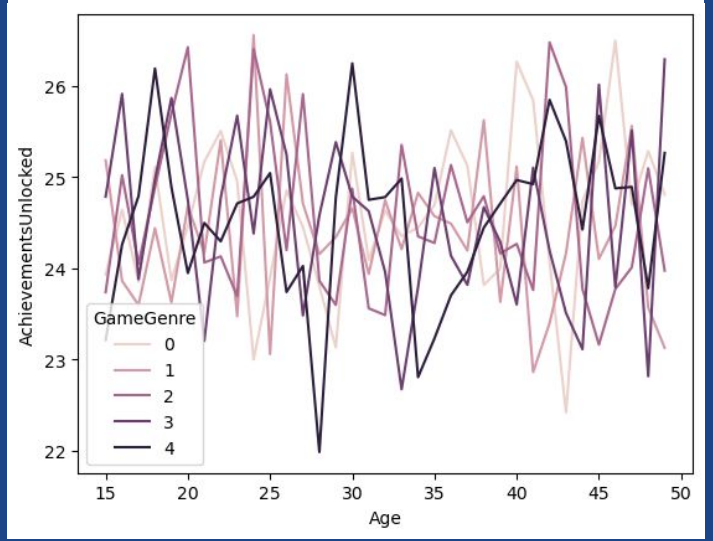
In-Game Purchases

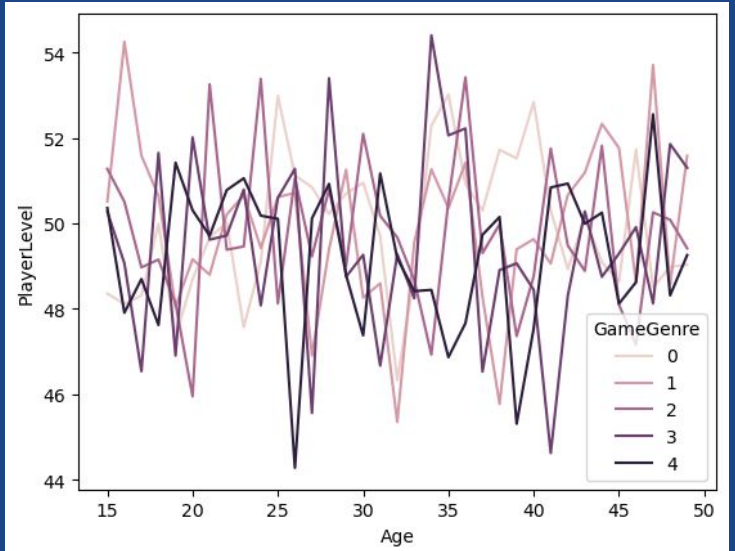


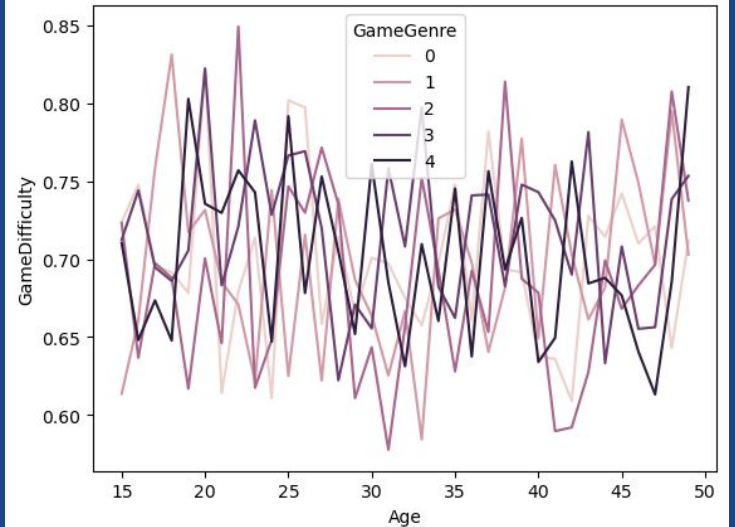
Game Difficulty



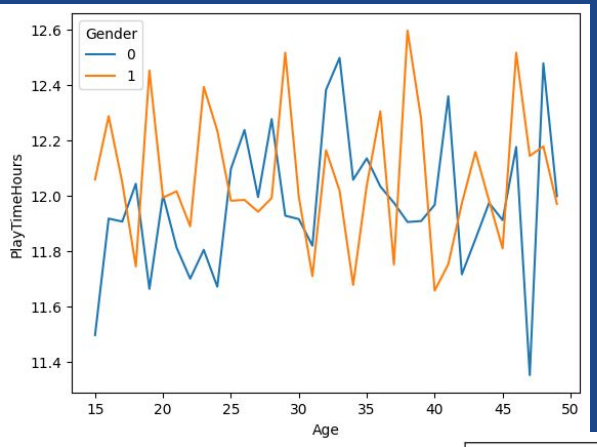

AvgSessionDurationMinutes
Age
GameGenre
0
1
2
3
4

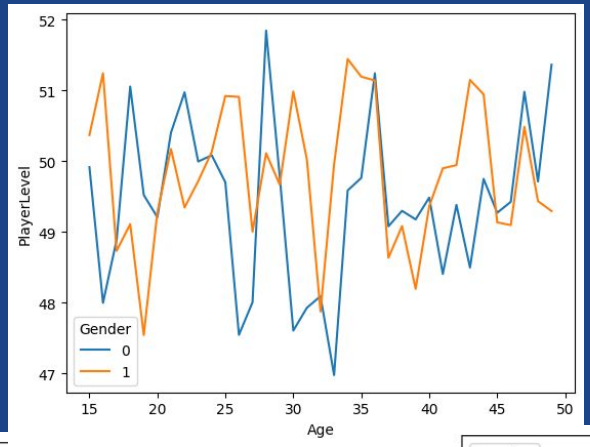

AchievementsUnlocked
Age
GameGenre
0
1
2
3
4

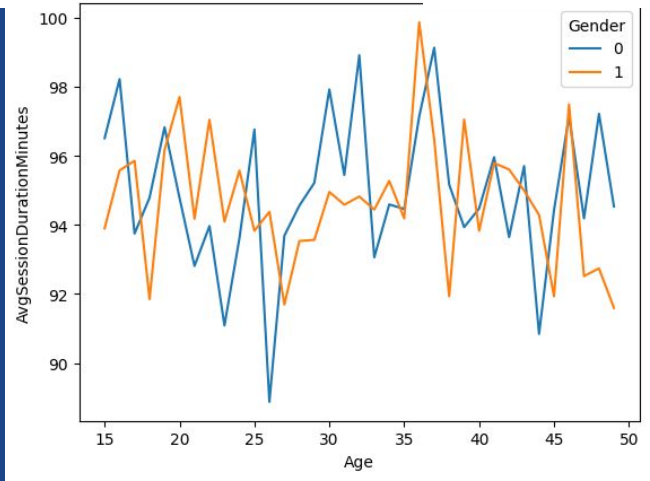

PlayerLevel
Age
GameGenre
0
1
2
3
4

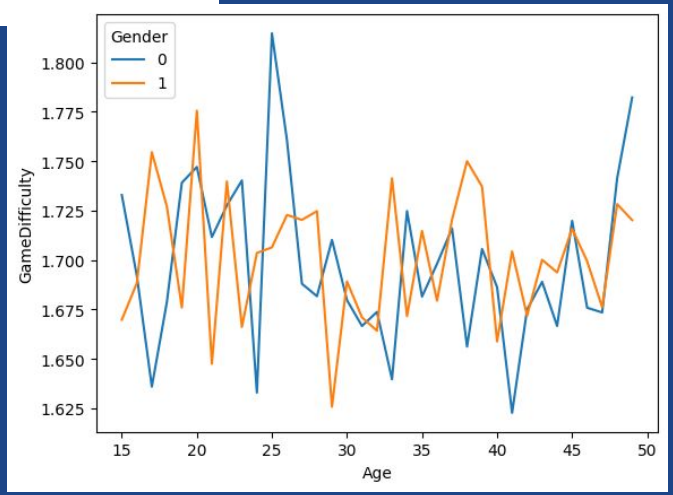

GameDifficulty
Age
GameGenre
0
1
2
3
4

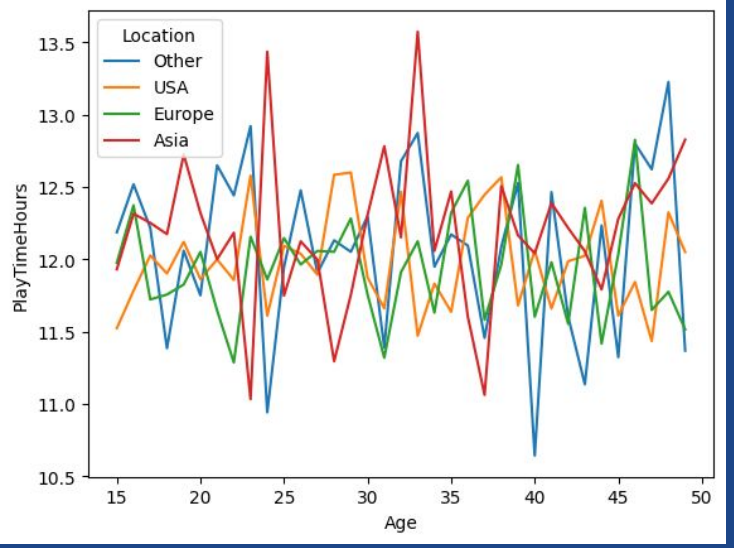
EXPLORING OTHER POSSIBLE CLASSIFIERS

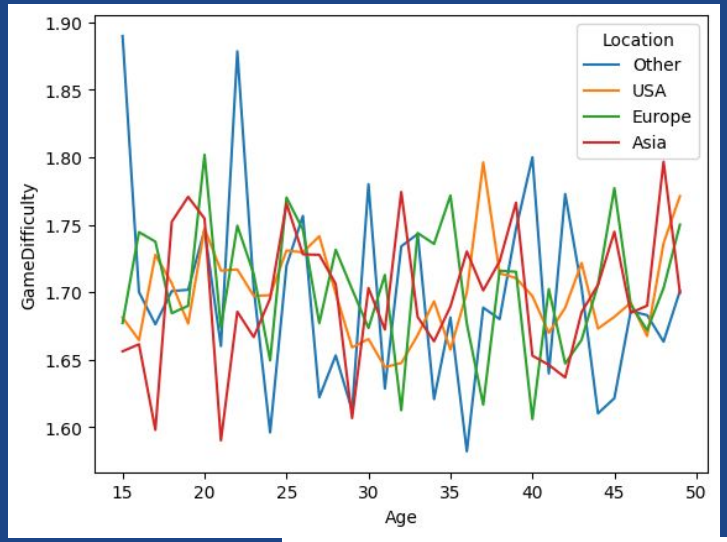


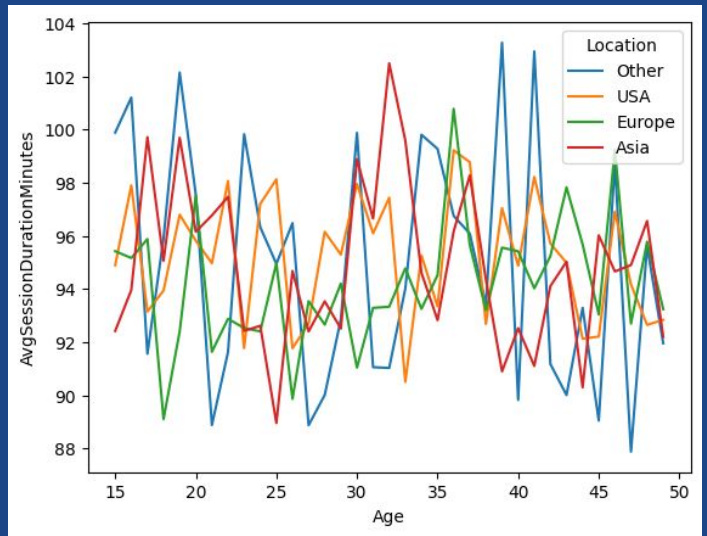


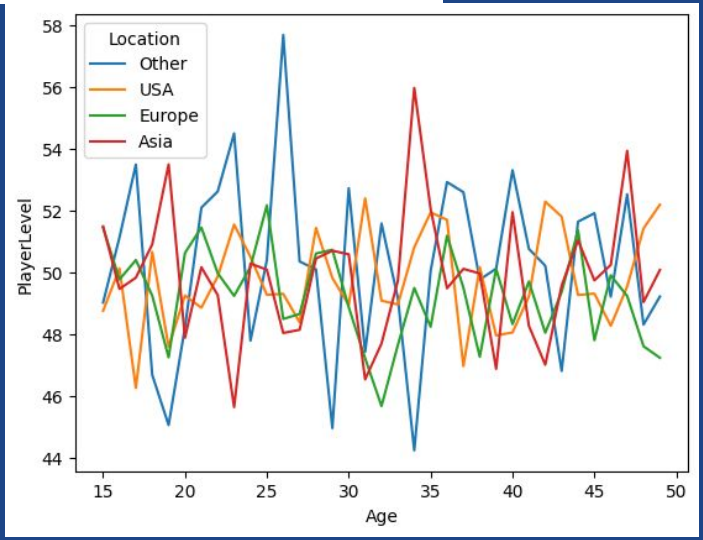




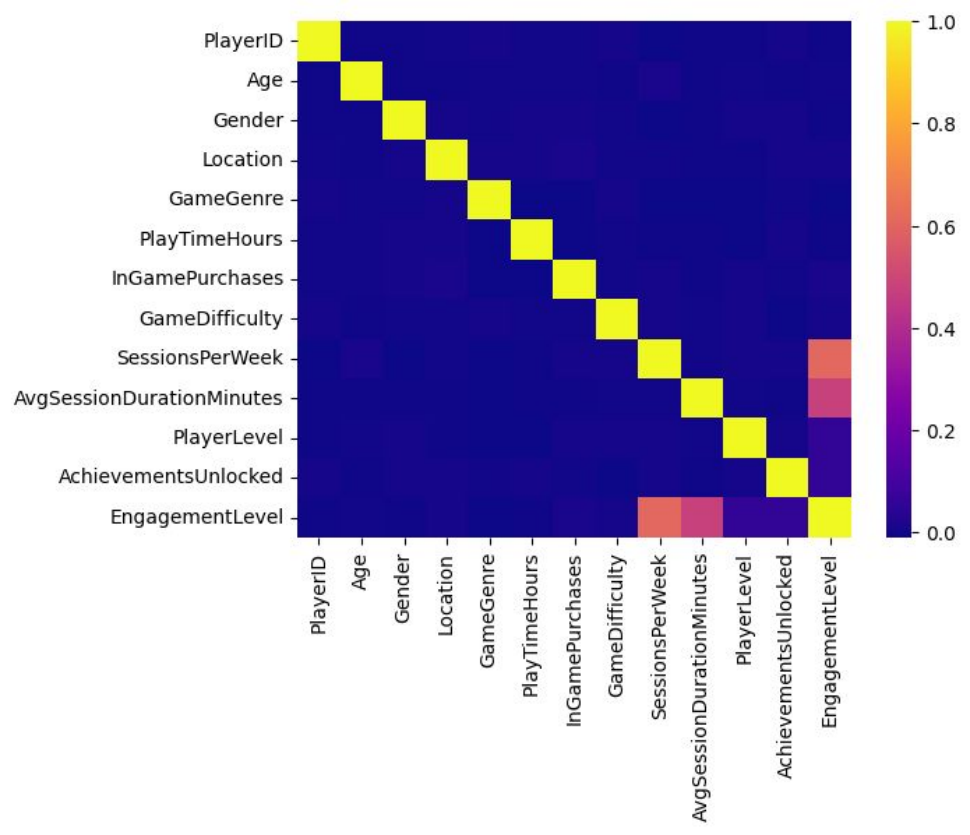

Location
Other
USA
Europe
Asia
PlayTimeHours
Age

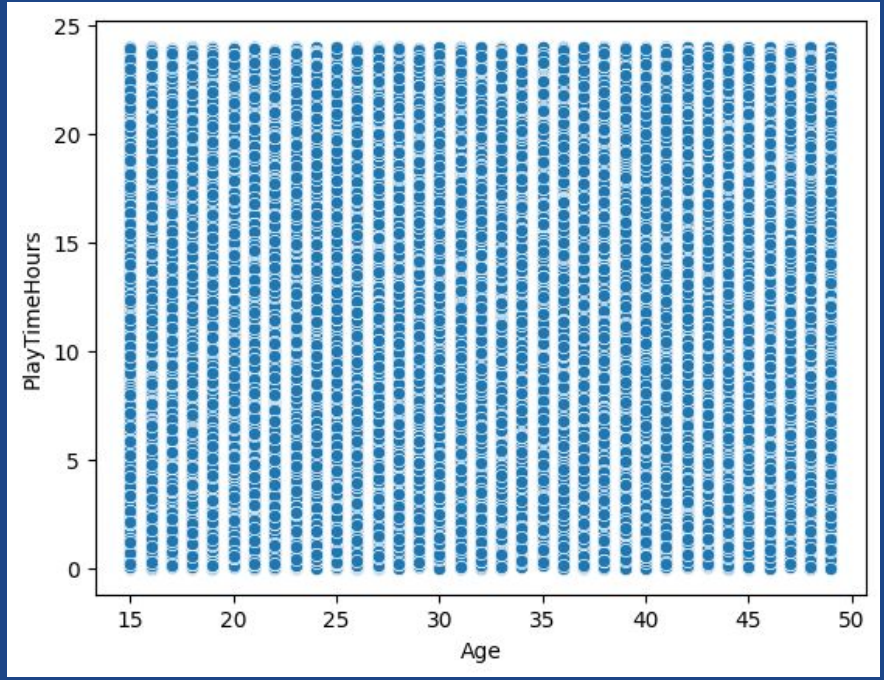

Location
Other
USA
Europe
Asia
GameDifficulty
Age


Location
Other
USA
Europe
Asia
AvgSessionDurationMinutes
Age


Location
Other
USA
Europe
Asia
PlayerLevel
Age

THE PROBLEM


PlayerID
Age
Gender
Location
GameGenre
PlayTimeHours
InGamePurchases
GameDifficulty
SessionsPerWeek
AvgSessionDurationMinutes
PlayerLevel
AchievementsUnlocked
EngagementLevel
1.0
0.8
0.6
0.4
0.2
0.0


PlayTimeHours
Age
25
20
15
10
5
0
15
20
25
30
35
40
45
50

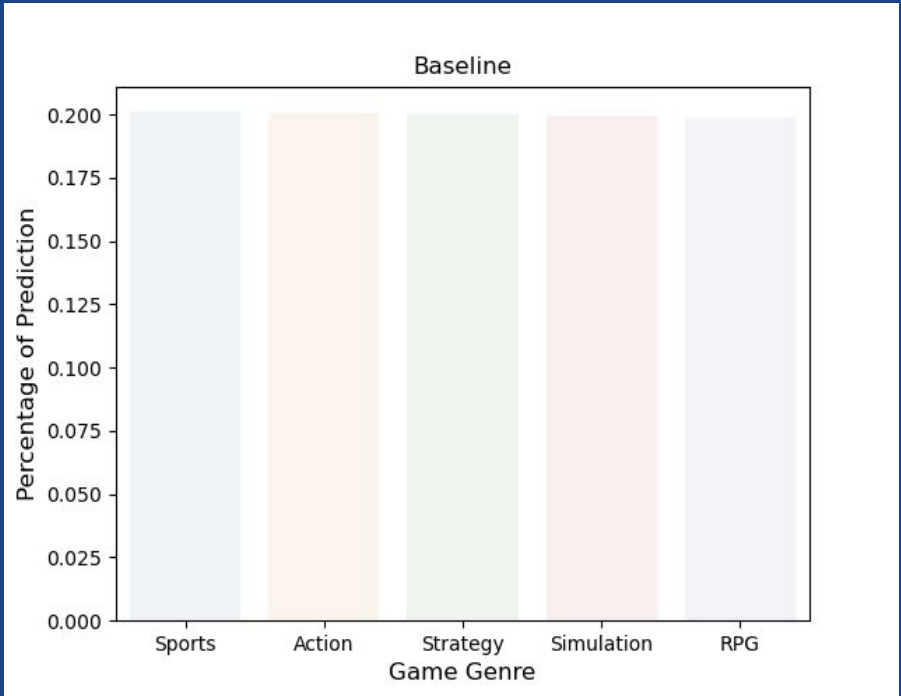
02

MODELING

A Struggle

BEATING BASELINE

Baseline - perfectly balanced



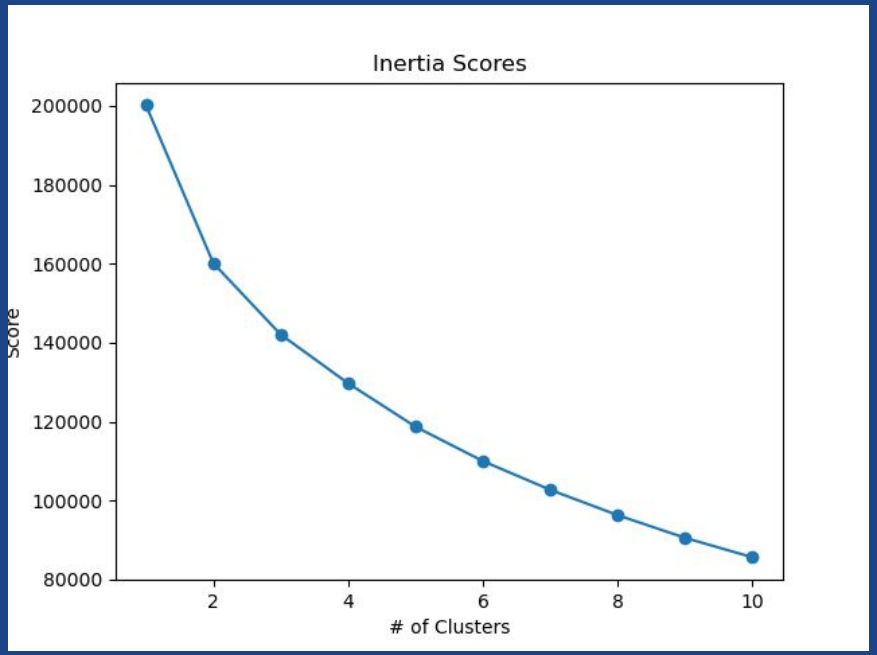
As the image shows on the left our data is perfectly balanced meaning our training data won't have any bias toward any genre.

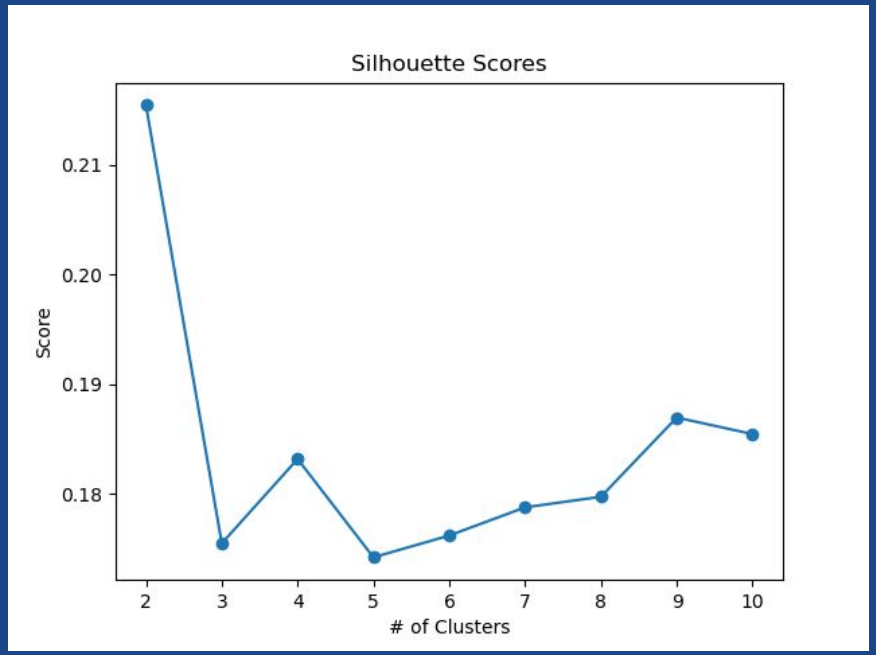
DATA

#	Column	Non-Null Count	Dtype
0	playerid	40034 non-null	int64
1	age	40034 non-null	int64
2	gender	40034 non-null	int64
3	location	40034 non-null	object
4	gamegenre	40034 non-null	object
5	playtimehours	40034 non-null	float64
6	ingamepurchases	40034 non-null	int64
7	gamedifficulty	40034 non-null	object
8	sessionsperweek	40034 non-null	int64
9	avgsessiondurationminutes	40034 non-null	int64
10	playerlevel	40034 non-null	int64
11	achievementsunlocked	40034 non-null	int64
12	engagementlevel	40034 non-null	object

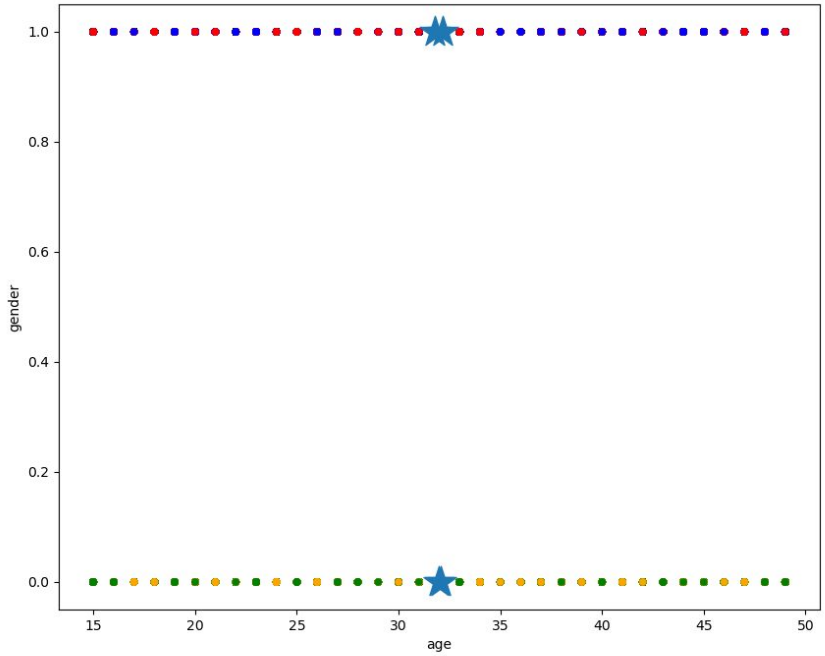
dtypes: float64(1), int64(8), object(4)

CLUSTERING


Inertia Scores
Score
200000
180000
160000
140000
120000
100000
80000
2
4
6
8
10
# of Clusters


Silhouette Scores
Score
0.21
0.20
0.19
0.18
2
3
4
5
6
7
8
9
10
# of Clusters

CLUSTERS



After going with 4 cluster here are the results:

Silhouette Score = 0.18319

Inertia Score = 129719.77

Building the Model

- Using all available X variables.
- Variables dummied:

  All categorical variables

- Variables squared:

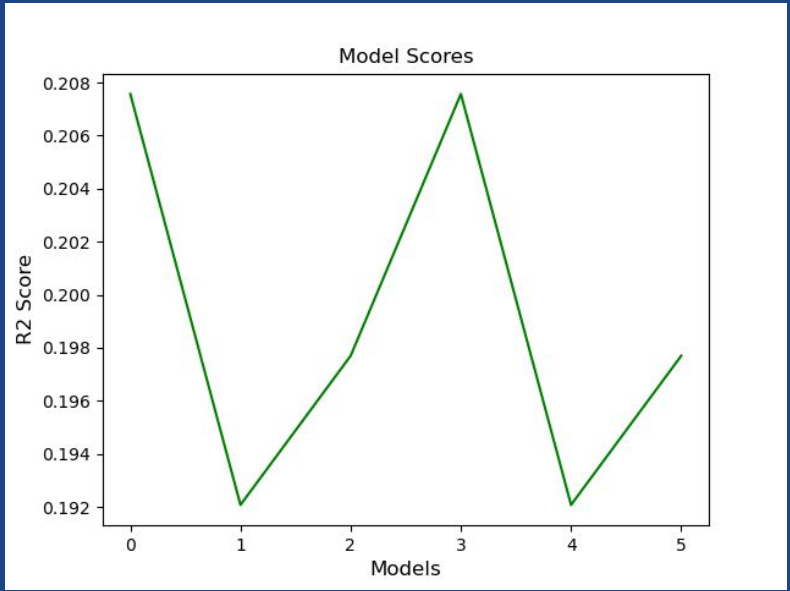
  Age

  Sessions per week

  Player level

- Standard Scaled
- 85% training data

R2 TESTING SCORES



0 = Voting Classifier (naive bayes, SVM, Logistic Regression)

1 = Random Forest (grid search)

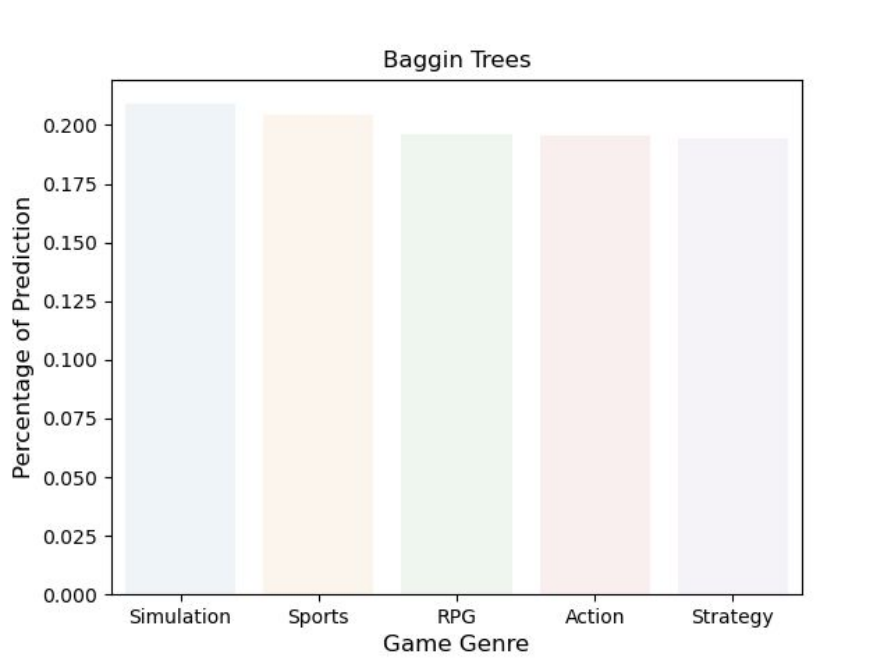
2 = Logistic Regression (no penalty)

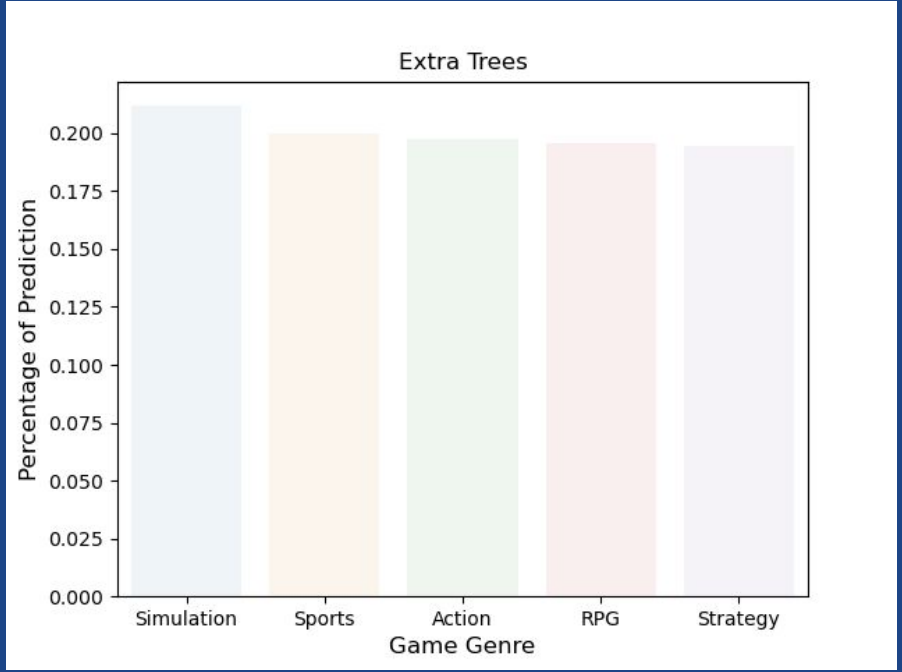
3 = Extra trees

4 = Decision Tree (with bagging)

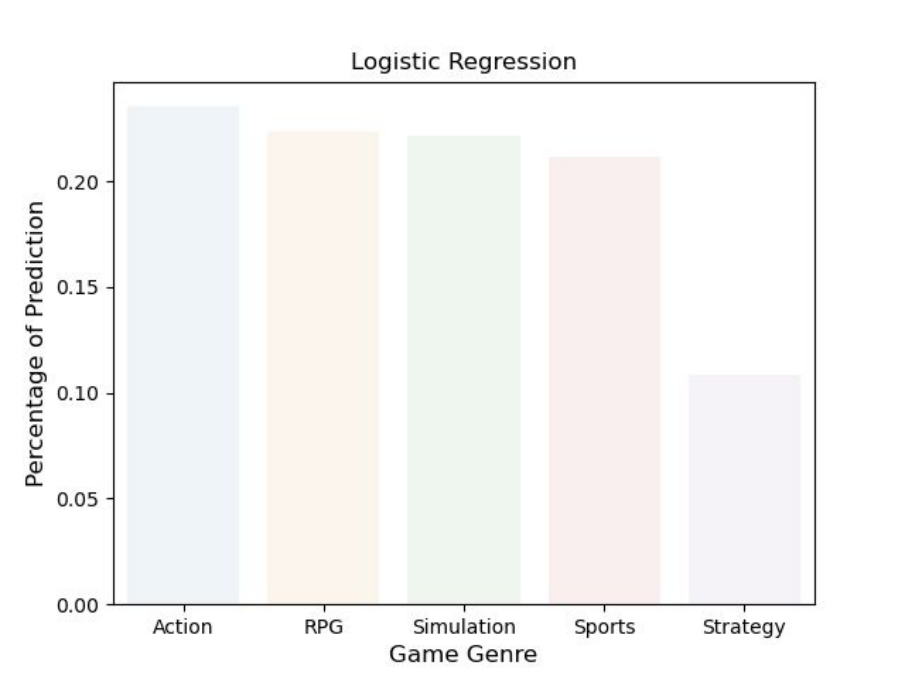
5 = Forward Feed (two dense layers, dropout .5)

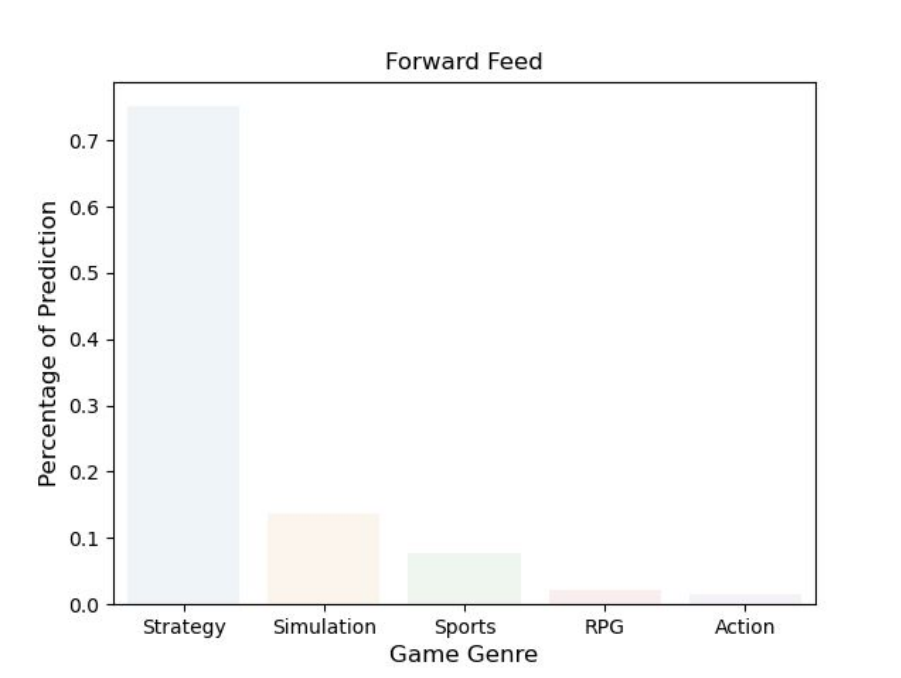
PERFORMANCE



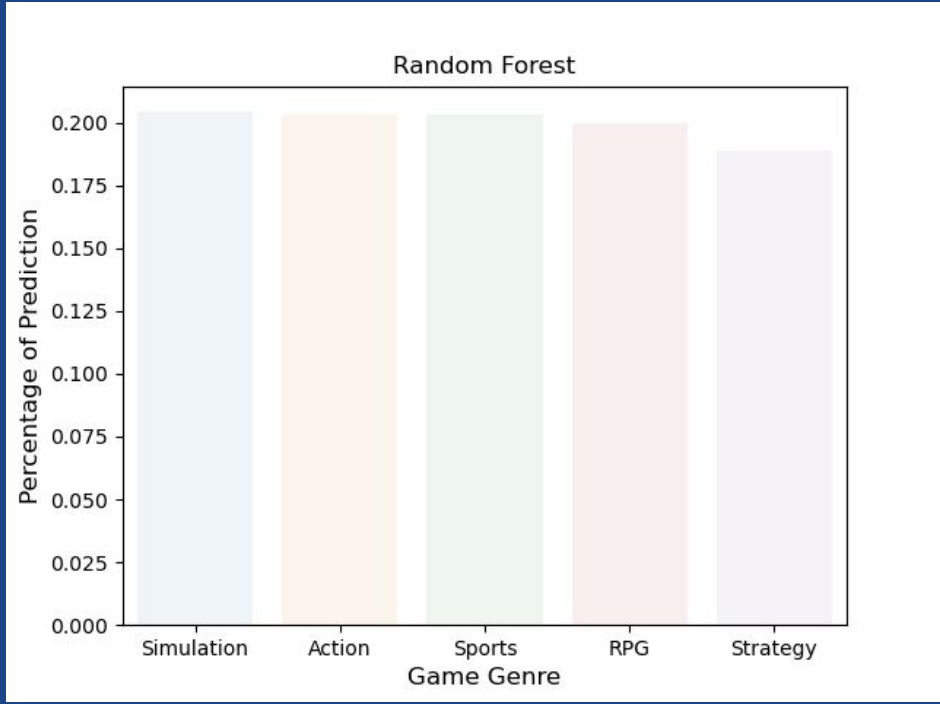


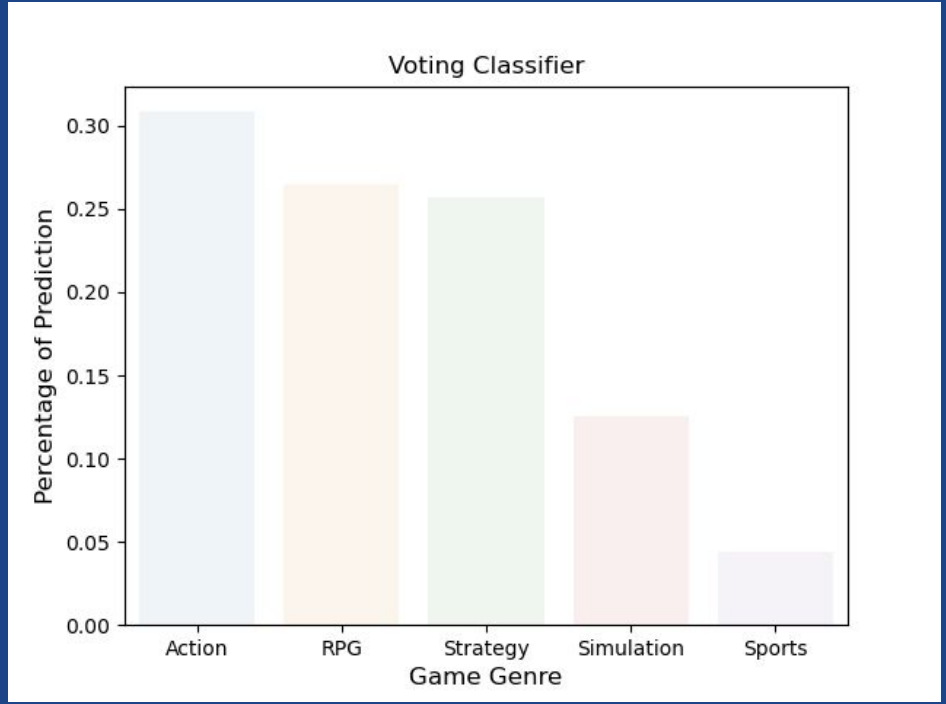
PERFORMANCE





PERFORMANCE



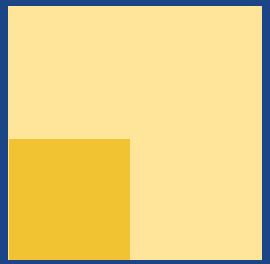


PREDICTIONS VS ACTUALS

	Actuals	Random Forest	Extra Trees	Logistic Regression	Voting Classifier	Baggin Tree
34667	Action	Action	RPG	Sports	RPG	Action
22227	Action	RPG	RPG	RPG	RPG	RPG
24899	Sports	Simulation	Simulation	Sports	RPG	RPG
35415	Action	Strategy	Strategy	Simulation	Strategy	Strategy
21440	Simulation	Strategy	RPG	Sports	RPG	Strategy

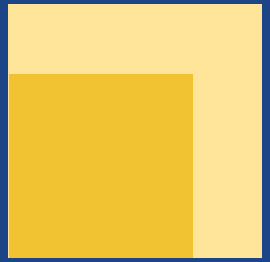
ROLE PLAYING GAMES

MORE DATA



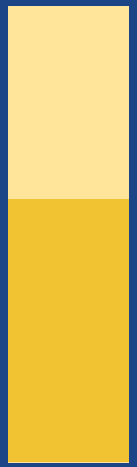
33%

Jupiter is the biggest planet

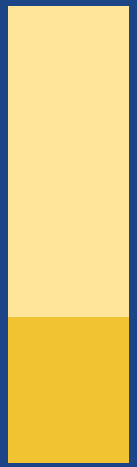


67%

Mercury is the smallest planet



VENUS



MARS

SATURN

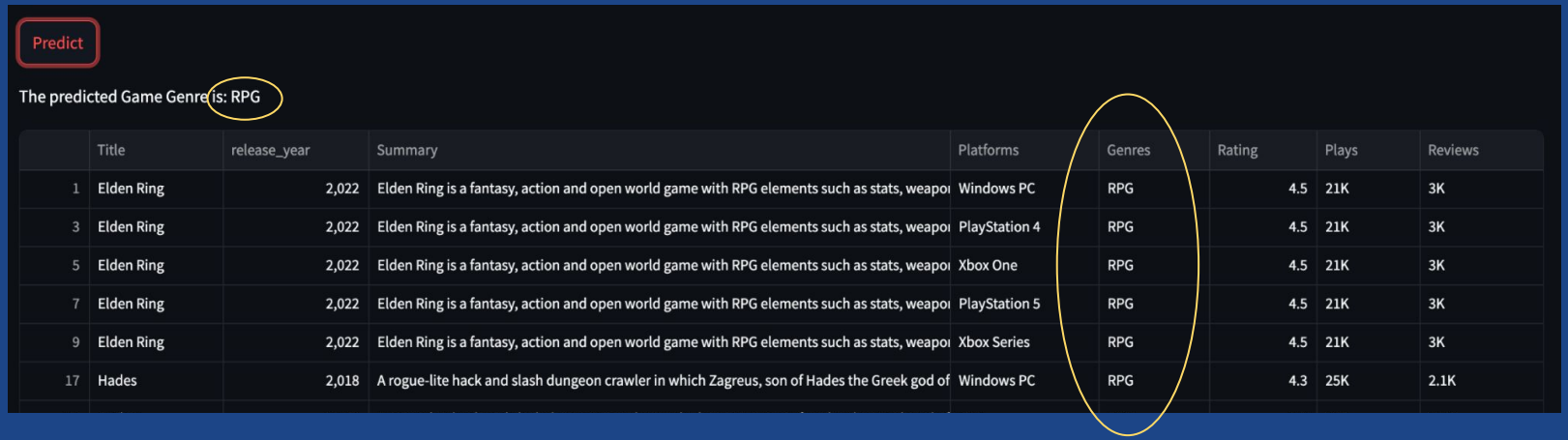
03

Streamlit App

STREAMLIT APP

Build an interactive form that uses our model to predict game genre based on the input

STREAMLIT APP



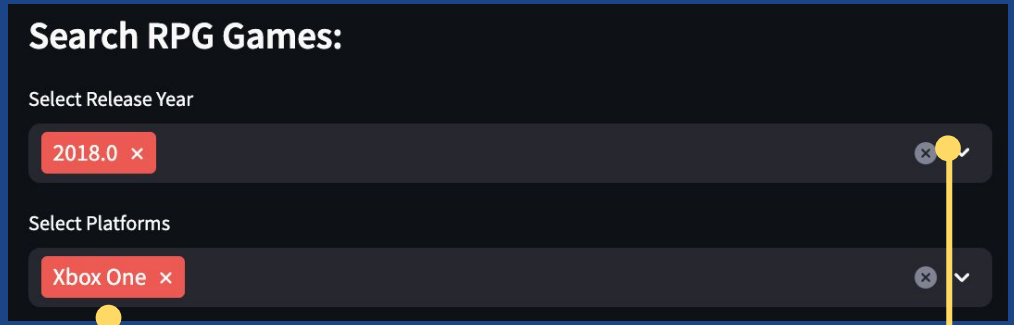
	Title	release_year	Summary	Platforms	Genres	Rating	Plays	Reviews
1	Elden Ring	2,022	Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapo	Windows PC	RPG	4.5	21K	3K
3	Elden Ring	2,022	Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapo	PlayStation 4	RPG	4.5	21K	3K
5	Elden Ring	2,022	Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapo	Xbox One	RPG	4.5	21K	3K
7	Elden Ring	2,022	Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapo	PlayStation 5	RPG	4.5	21K	3K
9	Elden Ring	2,022	Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapo	Xbox Series	RPG	4.5	21K	3K
17	Hades	2,018	A rogue-lite hack and slash dungeon crawler in which Zagreus, son of Hades the Greek god of	Windows PC	RPG	4.3	25K	2.1K

To improve functionality from there, we incorporated a second dataset with more detailed game information, including titles and genres.

That dataset was used to display a list of games matching the predicted genre, along with more detailed info like game summary and release dates.

STREAMLIT APP

We also included additional filtering functionality to allow the genre specific game data to be filtered by Release Year and Platform type



Title	release_year	Summary	Platforms	Genres	Rating	Plays	Reviews
Hades	2,018	A rogue-lite hack and slash dungeon crawler in which Zagreus, son of Hades the Greek god	Xbox One	RPG	4.3	25K	2.1K
Red Dead Redemption 2	2,018	Red Dead Redemption 2 is the epic tale of outlaw Arthur Morgan and the infamous Van der	Xbox One	RPG	4.4	22K	2K
Dark Souls: Remastered	2,018	Dark Souls Remastered is a remastered version of the original game Dark Souls. The update	Xbox One	RPG	4.3	13K	944
Monster Hunter: World	2,018	Welcome to a new world! Take on the role of a hunter and slay ferocious monsters in a livin	Xbox One	RPG	3.8	12K	441
Yakuza 3 Remastered	2,018	This is the third Yakuza game, remastered for PlayStation 4! The Yakuza wars are spreading	Xbox One	RPG	3.3	5K	571

STREAMLIT APP

Let's check it out!

04

Findings and Considerations

You can enter a subtitle here if you need it

NEW PARTICIPANTS

A PICTURE IS WORTH A THOUSAND WORDS

WELCOME!

SARAH DOE

- You can write here things about this person to introduce her
- You can write here things about this person to introduce her
- You can write here things about this person to introduce her
- You can write here things about this person to introduce her

05

EVENTS

You can enter a subtitle here if you need it

REVIEW OF PAST EVENTS

JANUARY

Mercury is the closest planet to the Sun

APRIL

Venus is the second planet from the Sun

MAY

Despite being red, Mars is actually a cold place

SEPTEMBER

Pluto is now considered a dwarf planet

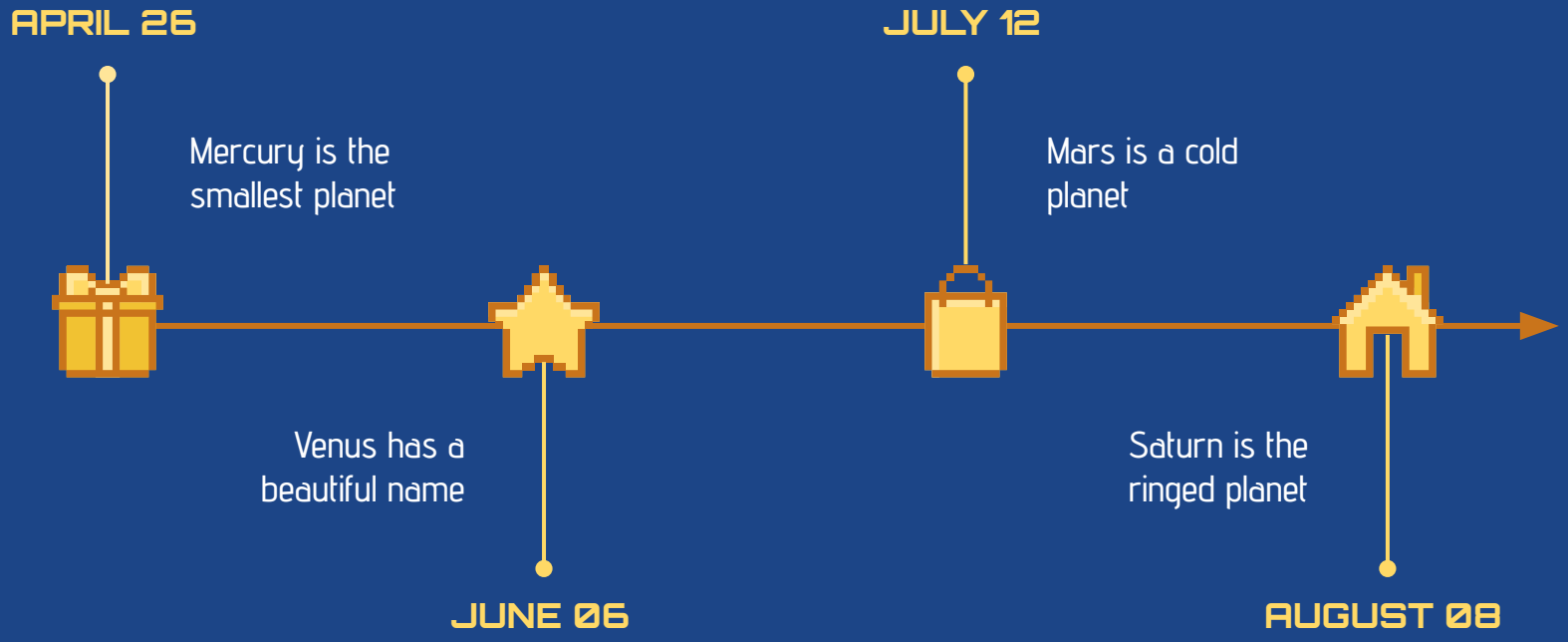
OCTOBER

Saturn is the ringed one and a gas giant

DECEMBER

Neptune is the farthest planet from the Sun

UPCOMING EVENTS



THANKS!

ANY QUESTIONS?

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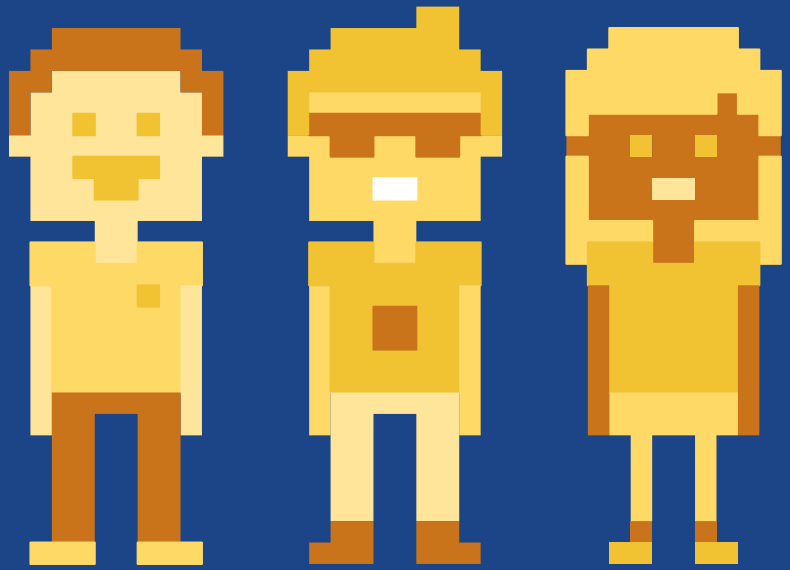
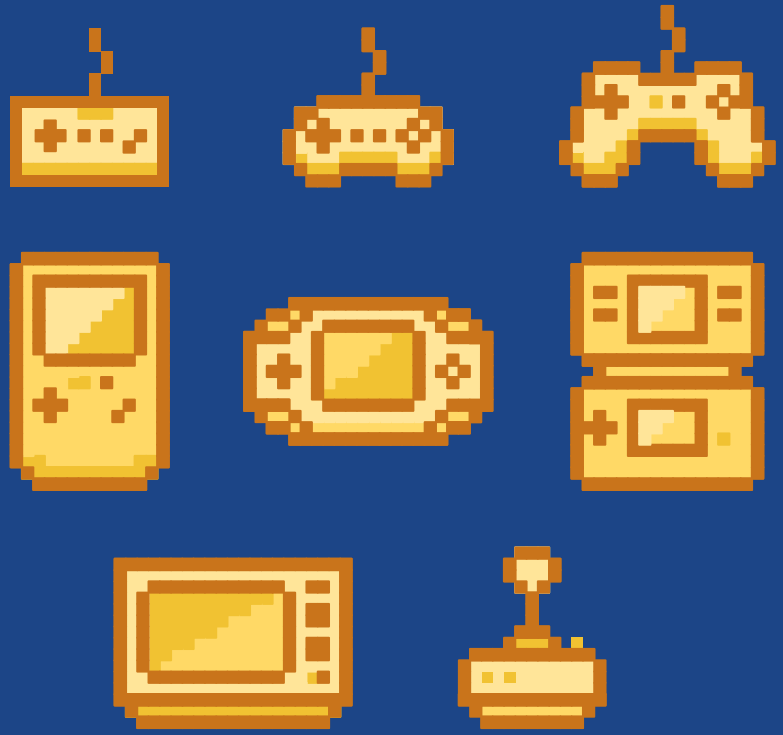
RESOURCES

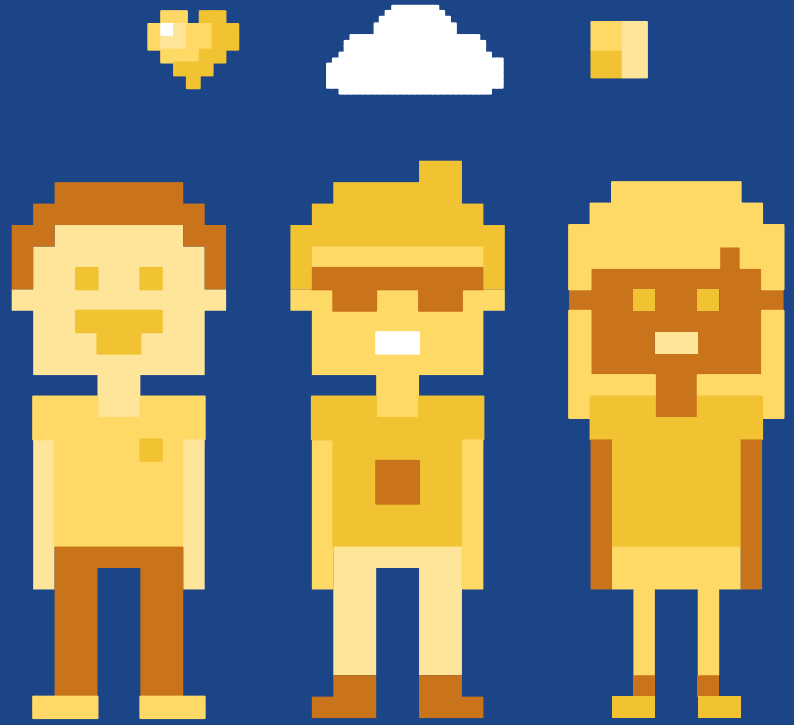
Sources:

- Kaggle- https://www.kaggle.com/datasets/rabieelkharoua/predict-online-gaming-behavior-dataset/data



ALTERNATIVE RESOURCES





CLUSTERING