💰 NBA MONEYBALL 💰

Machine Learning Contributors

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- MVP Predictor: Brian McHorney
- Team Predictor: Bryce Pribyl

Predictions and Market

- Vision - Wanted to spend time on something that is happening live and be able to train the model with new data as its available

- What's trending - NBA series had just started and there was a lot of buzz in the media and news about who will be the winners

- Goal - Create model that scores players performance and predict winning team based on regular season data

Our dataset consists of 25 records, each representing a player's performance in the NBA Finals

The dataset contains the following features:

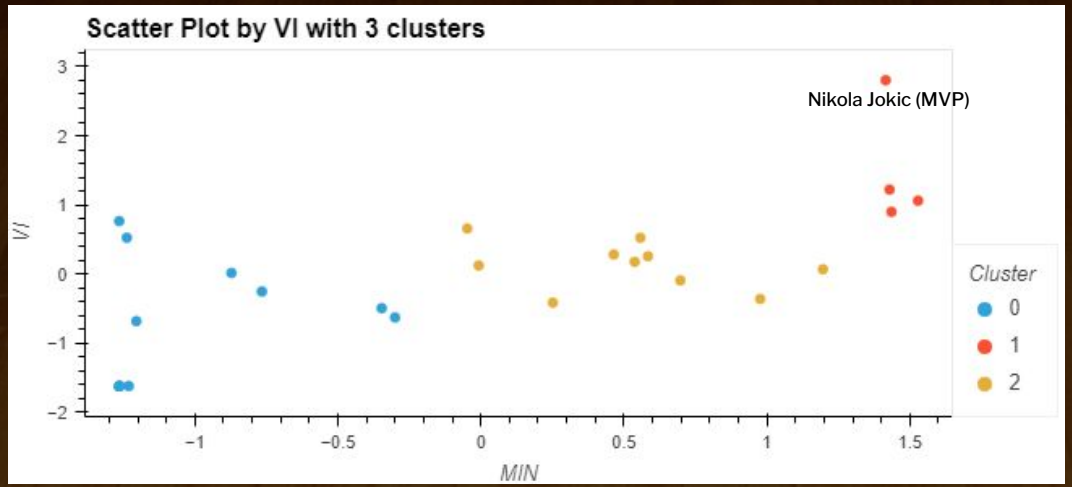
- **Minutes Played (MIN)**
- Field Goals Made (FGM)
- Field Goals Attempted (FGA)
- Field Goal Percentage (FG%)
- Three-Pointers Made (3PM)
- Three-Pointers Attempted (3PA)
- Three-Point Percentage (3P%)
- Free Throws Made (FTM)
- Free Throws Attempted (FTA)
- Free Throw Percentage (FT%)
- Offensive Rebounds (OREB)
- Defensive Rebounds (DREB)
- Total Rebounds (REB)
- Assists (AST)
- Turnovers (TOV)
- Steals (STL)
- Blocks (BLK)
- Personal Fouls (PF)
- **Points (PTS)**
- Plus/Minus (P/M)
- **Versatility Index (VI)**
- *Prediction (Target variable indicating MVP status)***

(Sample View)

PLAYER	MIN	FGM	FGA	FG%	3PM	3PA	3P%	FTM	FTA	FT%	...	REB	AST	TOV	STL	BLK	PF	PTS	P/M	VI	Prediction
Bam Adebayo	41.1	9.0	19.8	45.6	0.0	0.3	0.0	4.3	4.8	89.5	...	12.5	3.8	2.8	0.0	1.0	2.8	22.3	-6.8	9.4	1
Jimmy Butler	41.0	8.3	18.5	44.6	1.3	3.5	35.7	4.0	5.0	80.0	...	5.0	6.8	1.3	0.5	0.8	1.0	21.8	-8.5	10.6	1
Gabe Vincent	30.0	4.5	10.5	42.9	2.5	6.5	38.5	1.3	1.5	83.3	...	0.5	2.3	1.0	1.0	0.3	2.8	12.8	-3.8	5.7	1
Kyle Lowry	27.9	3.3	6.8	48.1	1.8	4.3	41.2	2.3	2.3	100.0	...	2.8	5.0	2.0	0.8	0.0	2.3	10.5	-3.5	8.0	1
Duncan Robinson	19.4	3.3	6.0	54.2	2.0	4.5	44.4	0.0	0.3	0.0	...	0.8	1.3	0.5	0.3	0.0	2.5	8.5	-5.0	6.5	1

PREDICTING MVP WITH MACHINE LEARNING

	VI	PLUS/MINUS	Prediction	Cluster
	0.900238	-1.268401	1	1
	1.221752	-1.587945	1	1
	-0.091096	-0.704500	1	2
	0.525139	-0.648110	1	2
	0.123247	-0.930060	1	2



LinearRegression() model

Based on the in game stats the most valuable player is: Name: **Nikola Jokic**

```
#Accuaracy score for the model
y_pred = model.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

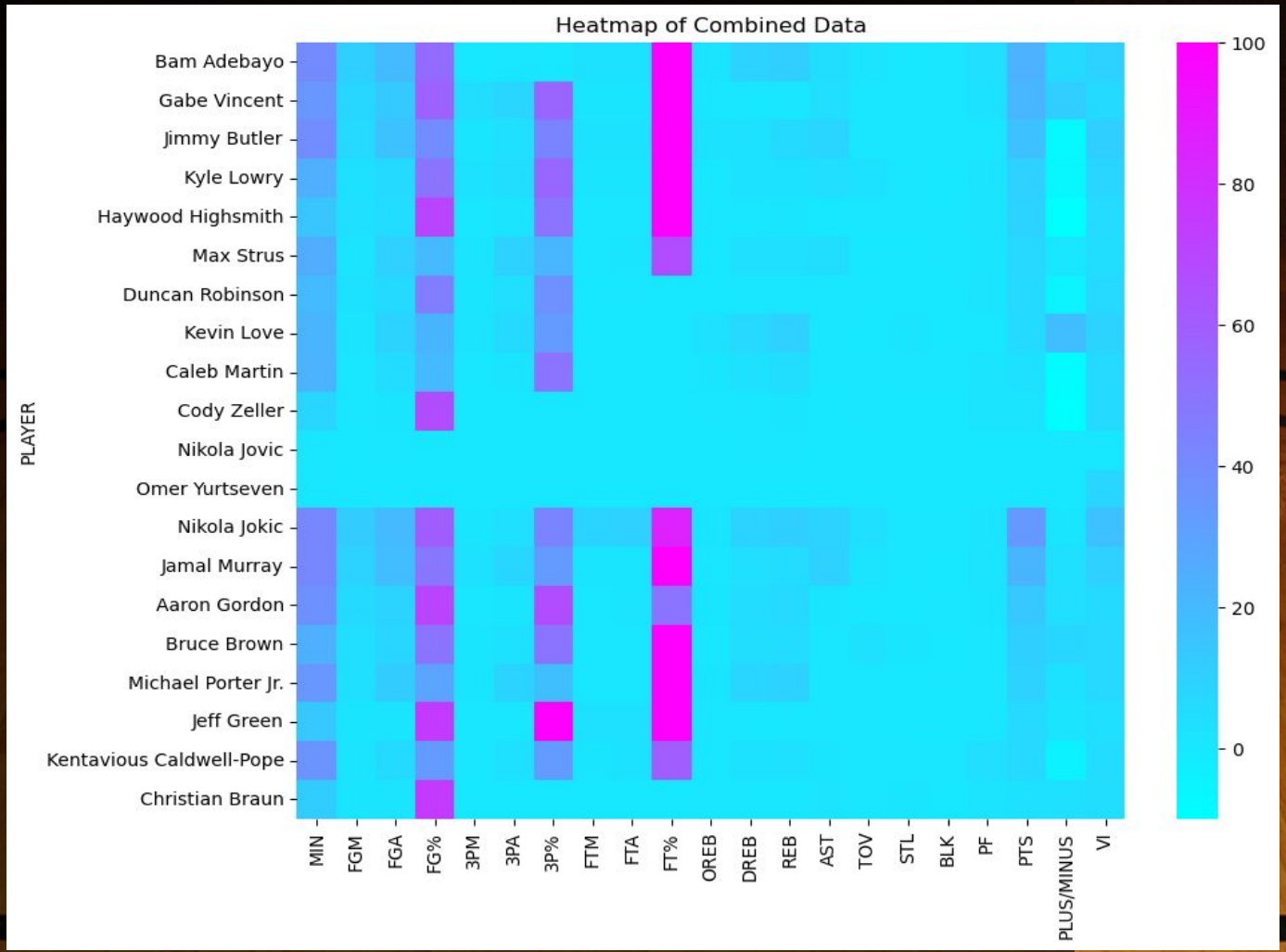
Accuracy: 0.8015

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 dense (Dense)               (None, 9)                 27

 dense_1 (Dense)             (None, 6)                 60

 dense_2 (Dense)             (None, 2)                 14

=================================================================
Total params: 101
Trainable params: 101
Non-trainable params: 0
_________________________________________________________________
```



MVP Player Heatmap

MVP PREDICTOR

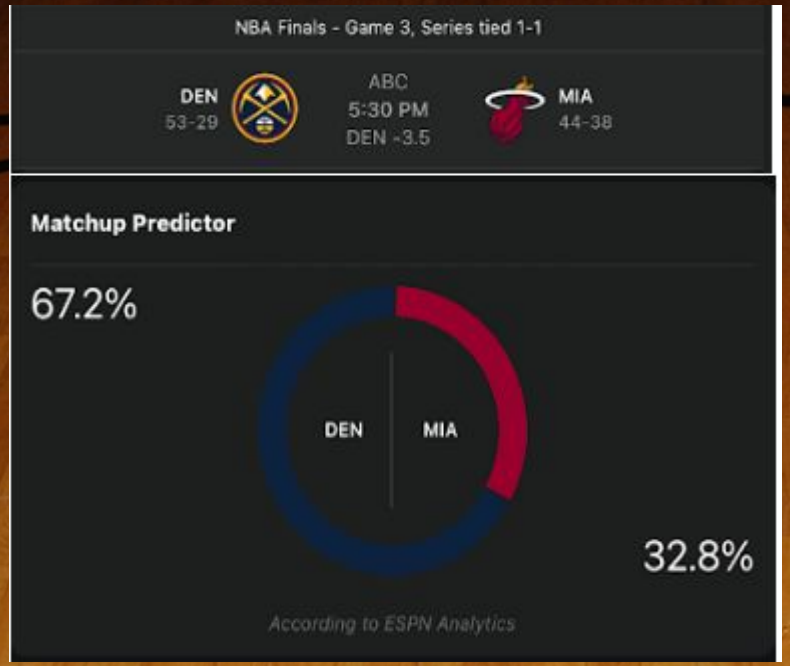
- Binary classification model to predict the NBA Finals MVP
- Linear Regression machine learning
- Exclusively based on NBA Finals Player Data (per game)
- Correctly predicted the NBA Finals MVP: Nikola Jokic!!

ML Team Model

- RandomForestRegressor Machine Learning
- Inception: post-game 2 & prior to the start of game 3
- 2022-2023 Regular season & NBA Finals Data
  - CSV data from NBA.com
  - ESPN Matchup Predictor
- Oddspedia API integration with live betting odds: FanDuel, DraftKings
- NBA Moneyball Metrics: Points, Rebounds, Assists
- Surprise in store… wait for it…..

2023 NBA Finals Winning Game Predictor: Game 3 sample

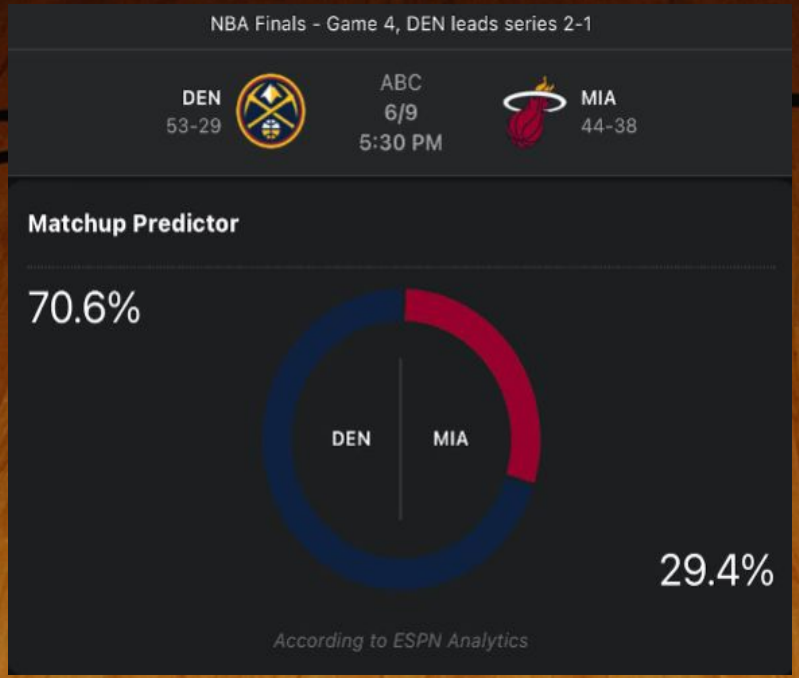
ESPN Matchup Predictor



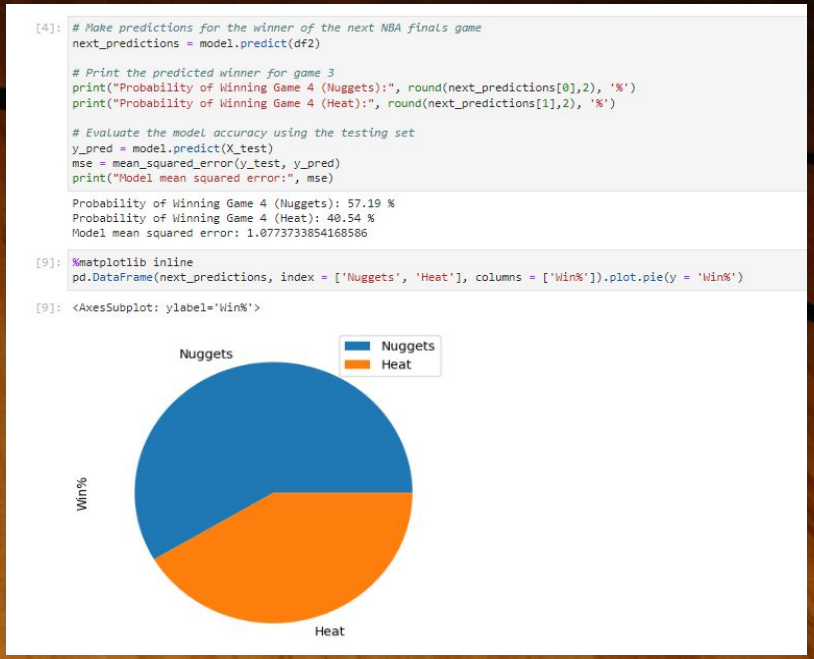
BCB Model Prediction

2023 NBA Finals Winning Game Predictor: Game 4 sample

ESPN Matchup Predictor



BCB Model Prediction



Successful (potentially lucrative) Results

- Accurately predicted the winner of games 3-5 (Denver Nuggets)!
- Correctly predicted the NBA Finals MVP: Nikola Jokic!!

We are HIRING!

Predict winners of each game for all the series by taking regular season data of current year

Take more historical data of all MVPs for the last 5 years to give better prediction results

End game betting app to get real time odds.

Share model to betting websites like oddspedia for all users to use the model

Analyze Google trends or twitter for fan sentiment analysis

References

Player Data	https://www.nbastuffer.com/2022-2023-nba-player-stats/
US Sports Betting Revenue	https://www.legalsportsreport.com/sports-betting/revenue/
NBA Moneyball	https://www.nbastuffer.com/analytics-101/nba-moneyball/
Model	https://www.dataart.com/blog/5-use-cases-for-machine-learning-in-sports-betting https://www.dataart.com/clients/case-studies/applications-suite-for-a-sports-analytics-company
Odds API	https://the-odds-api.com/#get-access