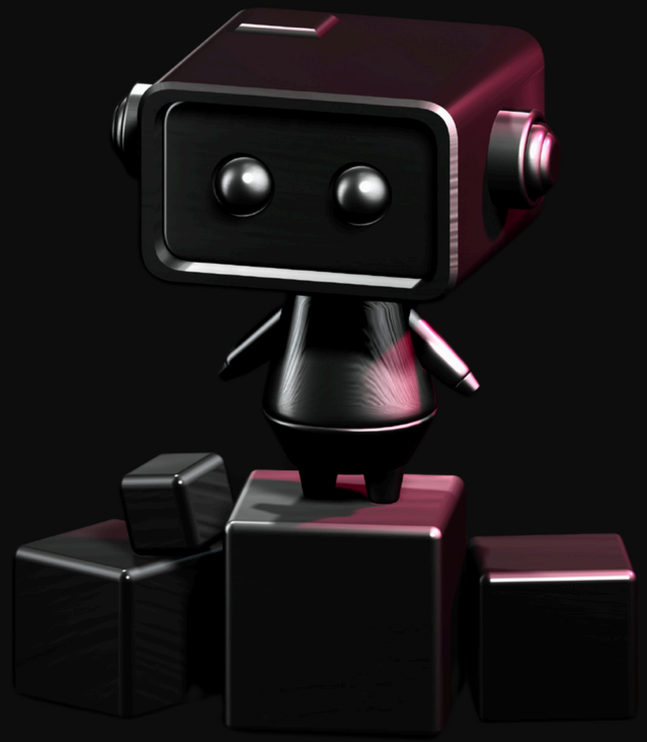
Team 57 *presents*

EDGE 11

Your AI Fantasy Team Strategist



Problem Statement

The Challenge We Address

Complex match statistics

Lack of predictive insights

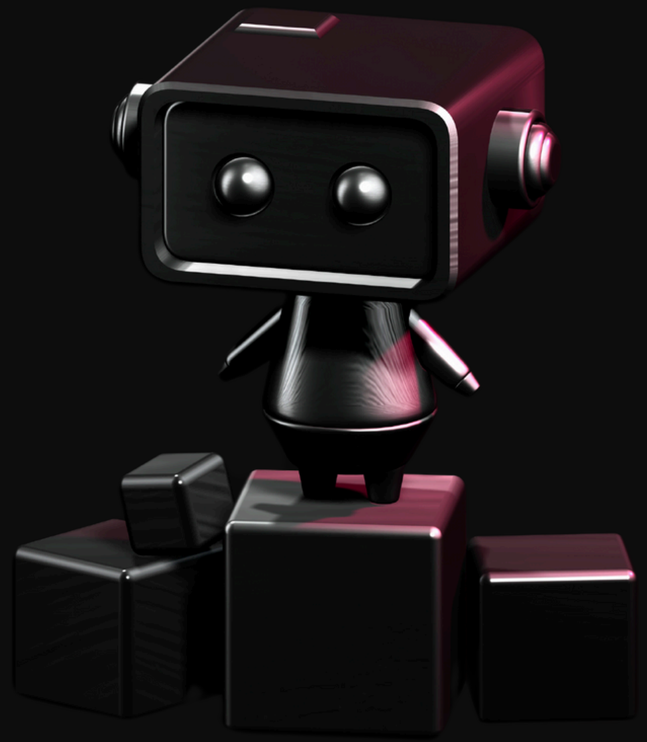
Time-consuming selection process

Our Solution - Edge11

Overview

What is Edge11?

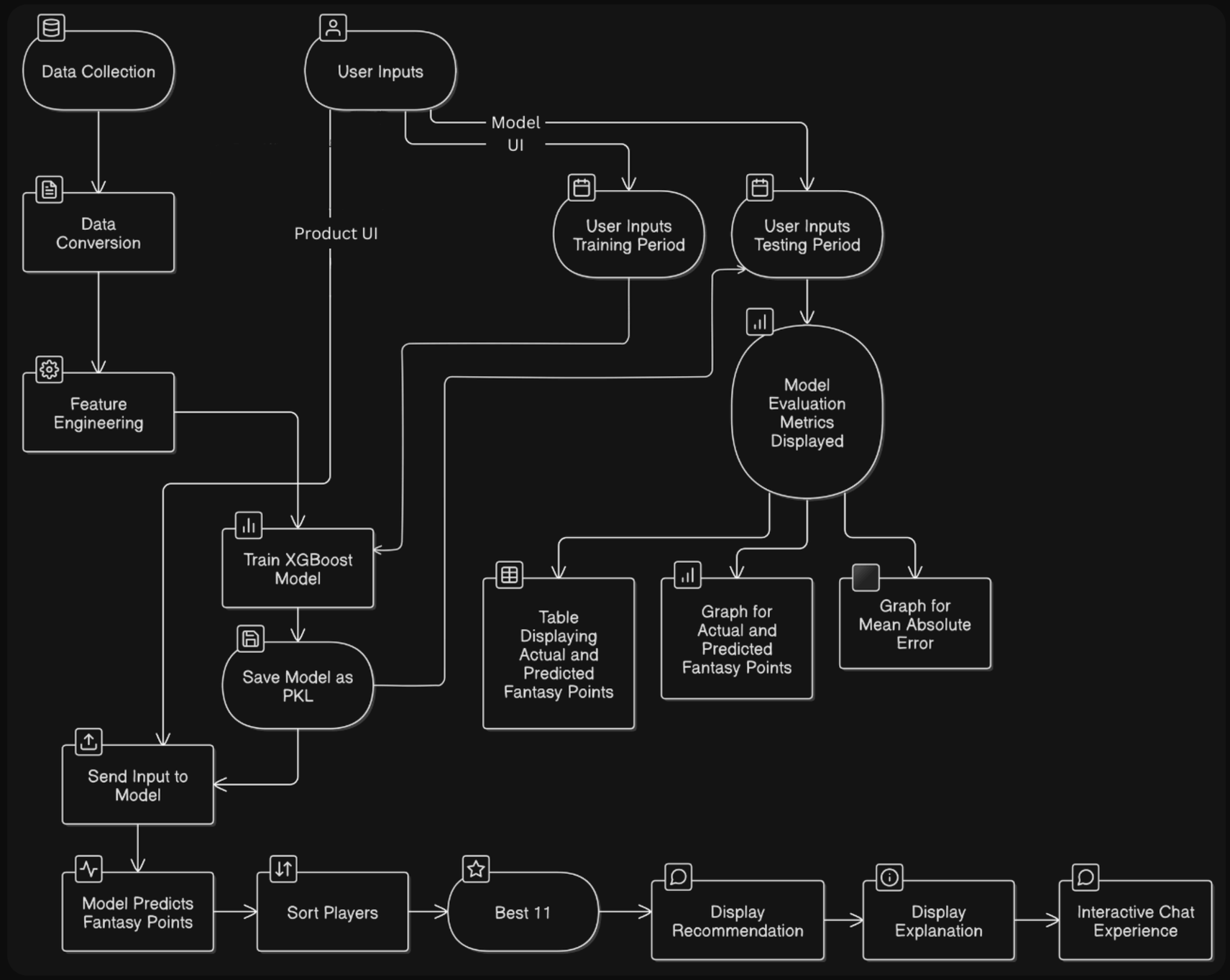
- An AI-powered team-building assistant.
- Delivers optimized team recommendations using ML models.
- Explains player selections with real-time insights.



Why Edge11 Stands Out:

- Predictive accuracy
- Explainable AI
- Seamless, interactive user interface

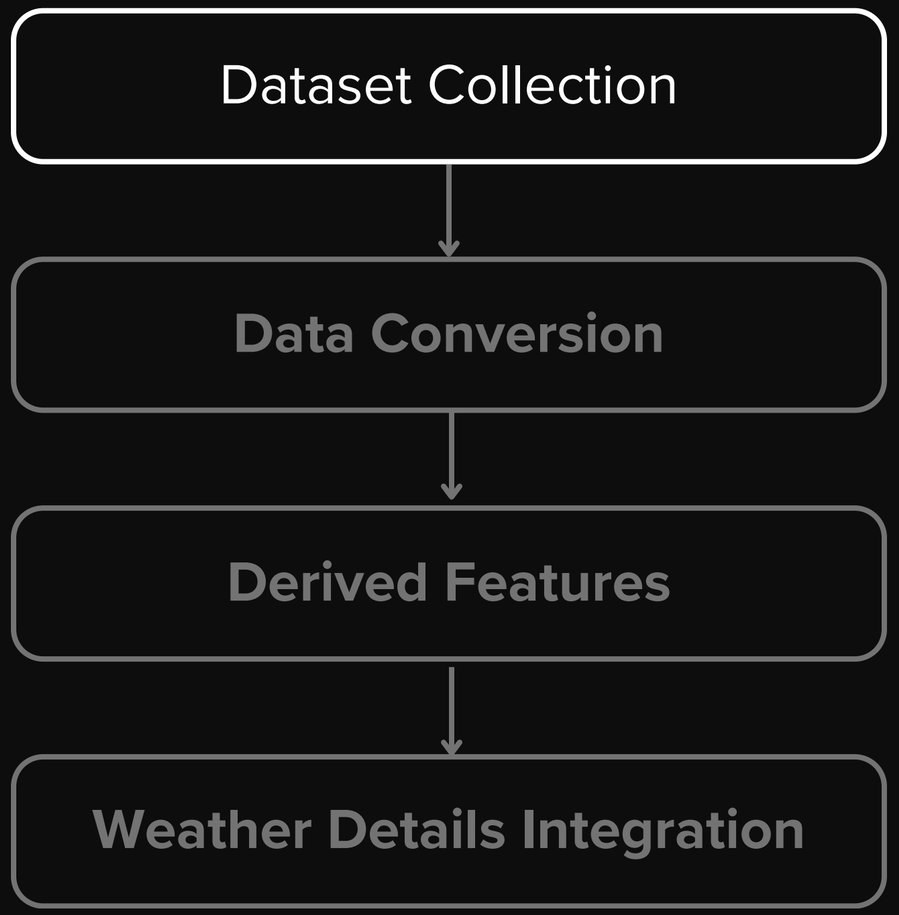
System Architecture



Flowchart depicting the System Architecture

Walkthrough of Solution

Feature Engineering

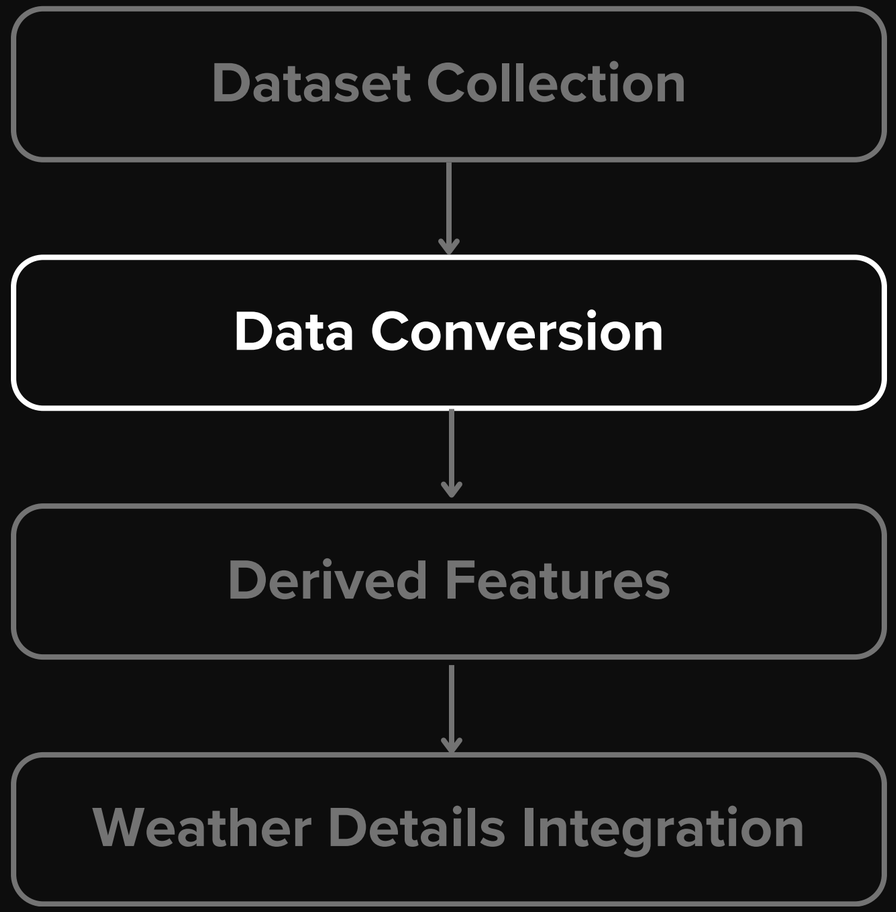


The data was collected from Cricsheet.org, which provides detailed ball-by-ball statistics for over 17,994 cricket matches.

This dataset includes:

- Metadata
- Match Information
- Officials
- Player Registry
- Innings Data
- Additional Information

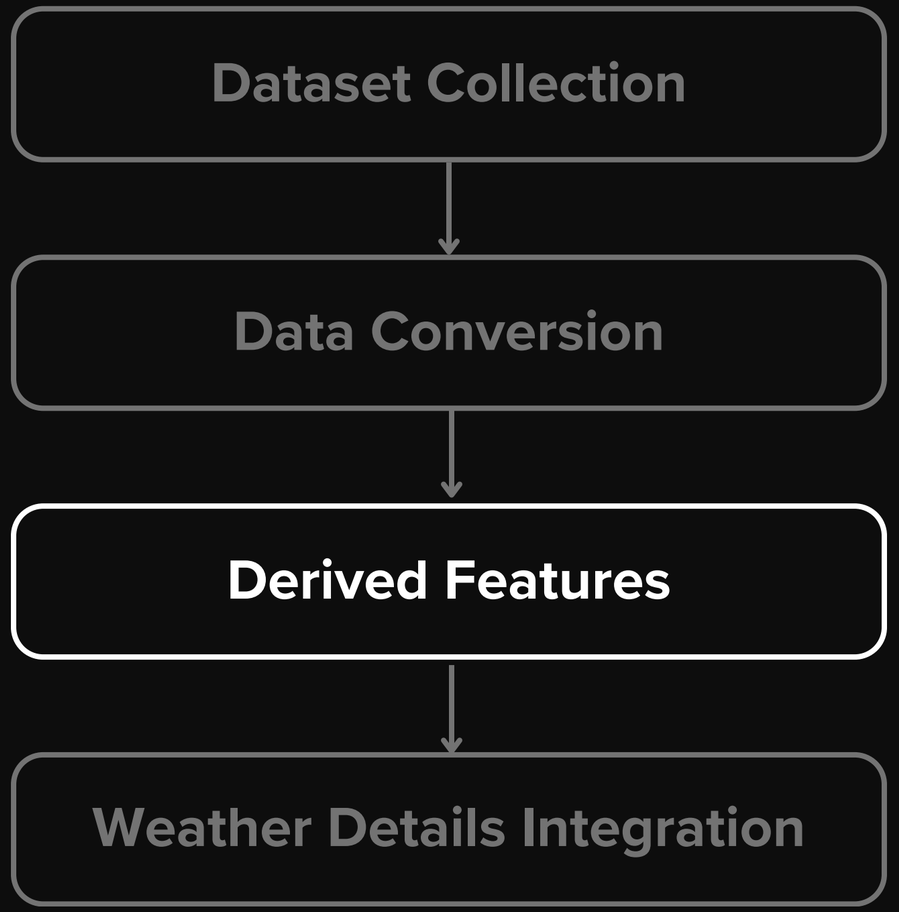
Feature Engineering



The raw data was converted into a player-level dataset to facilitate predictive modeling. The new dataset includes:

- Date
- Venue
- Player Name
- Match Type
- Total Runs Scored
- Balls Played
- Boundaries
- Batting Order
- Wickets Taken
- Overs Bowled
- No. of catches
- No. of Stumpings
- Maiden Overs

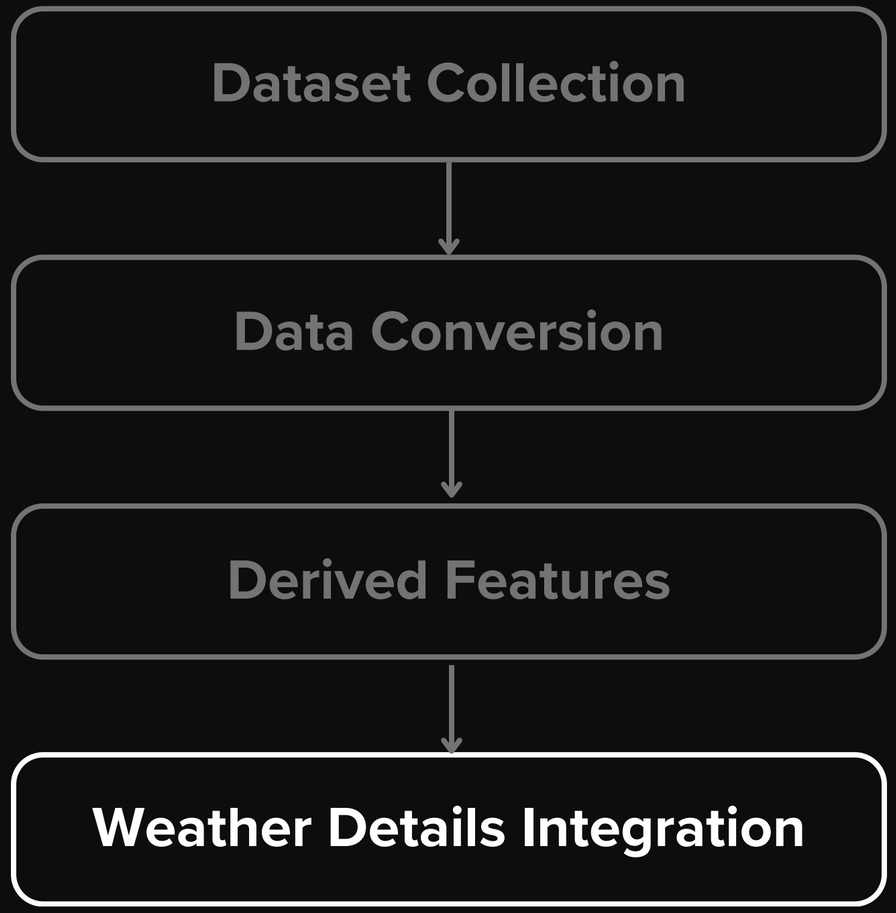
Feature Engineering



We created additional features to capture trends and improve model accuracy:

- Avg Runs Last 10
- Avg Wickets Last 10
- Std Runs Last 10
- Avg Runs Venue
- Avg Runs vs Opponent
- Matches Played
- Total Runs Cumulative
- Weighted Avg Runs Last 10
- Runs Wickets Interaction
- Avg_FP_venue
- Avg_FP_Last_10
- Total_Catches
- Ducks

Feature Engineering



Weather can impact player performance, so we integrated historical weather data for each match day using:

APIs used:

- Nominatim API
- Open-Meteo API

Data Extracted:

- Max/Min Temperature
- Max/Min Humidity
- Precipitation

ML Models Explored and Challenges

We experimented with various ML models to predict fantasy points but failed to achieve a satisfactory MAE:

ML Models	Problems Faced
N-BEATS	Struggled with sparse data for individual players, leading to poor performance.
Neural Networks	Overfitting issues and difficulty in capturing complex categorical relationships.
LightGBM	Efficient but failed to handle categorical and time-based features effectively.
CatBoost	Promising for categorical data but underperformed due to weak feature-target correlations.

Why XGBoost?

XGBoost was chosen for this task due to its excellent performance on datasets with a combination of numerical and categorical features. The key reasons for selecting XGBoost are:

Handling Sparse Patterns

XGBoost excels in handling sparse or unclear patterns through its gradient-boosting mechanism.

Capturing Non-Linearity

XGBoost can model non-linear interactions between features, crucial for understanding complex data like player performance and match conditions.

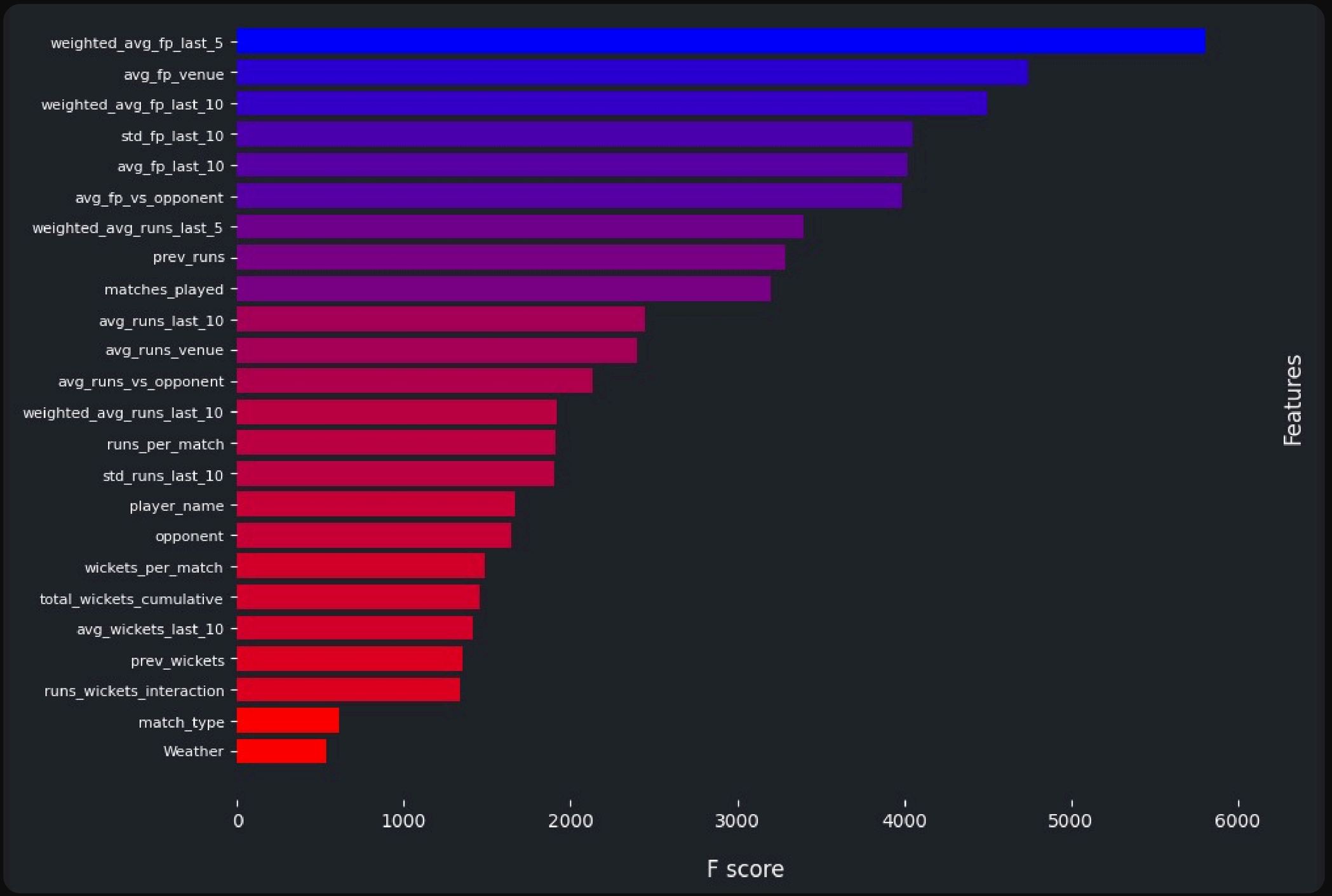
Robustness to Missing Values

The model automatically handles missing data during training, which is important given the incomplete or inconsistent nature of the dataset.

Model Overview

The model used for predicting fantasy points is the XGBoost Regressor (XGB Regressor), a powerful gradient boosting framework suitable for structured/tabular data. The model was configured with the following hyper-parameters:

- n_estimators: 1000
- learning_rate: 0.05
- max_depth: 6
- subsample: 0.8
- colsample_bytree: 0.8
- random_state: 42
- objective: reg:squarederror (for regression tasks).



Feature Importance

Fscore is the frequency of how many times a feature was used to split the data across the trees.

Evaluation Metrics

The model's performance was evaluated using several metrics (in the period 19/12/2001 to 30/6/2024) using 80:20 Random Split

10.86
MAE

0.7945
R^2 Score

14.89
RMSE

17.62
MAPE

Evaluation Metrics

UI Demonstration

EDGE 11 Model Performance Dashboard

Model Evaluation

Training Period

Start Date:

01-01-2015

End Date:

dd-mm-yyyy

Testing Period

Start Date:

dd-mm-yyyy

End Date:

dd-mm-yyyy

Submit

Metrics

Mean Absolute Error (MAE)	10.6
Root Mean Squared Error	14.5
R^2 Score	0.79

DREAM11

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Meet

EDGE 11

Your AI Fantasy Team Strategist

Unleash the power of AI to create your perfect team. Let Edge 11 predict the best XI players for any match, maximizing your chances to win big.

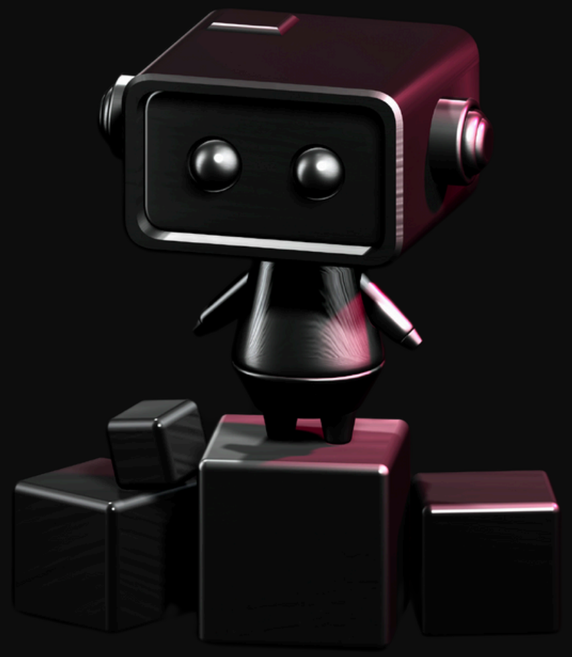
Watch our tutorial · Watch our tutorial · Watch our tutorial ·

Future Scope

Future Enhancements:

- Integration with Dream11 app.
- Model improvement with live match updates.
- Using a better attuned dataset with better Features; like player injury statistics
- Expanding to other sports (e.g., football, basketball).
- Enhanced selections using AI voice assistants.

Thank You


Team mai bna leta hoon, aap jaake Dream11 par contest join kro :)