CRICLYS
CRICKET
ANALYTICS

BinaryBlackHole

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"AI-Powered Predictive Model for Cricket:
Beyond Traditional Analytics"

Introduction

Objective:
To create a web application that analyzes and predicts a cricket player's performance in Upcoming matches against a **given Team on a given Venue**

Extend predictions to fantasy points to benefit users of fantasy leagues, teams, and betting platforms.

Key Features:

- In-depth performance analysis (runs, wickets, strike rate, economy, etc.)
- Prediction model for upcoming matches
- Fantasy points prediction for fantasy leagues

Why Did We Choose Cricket

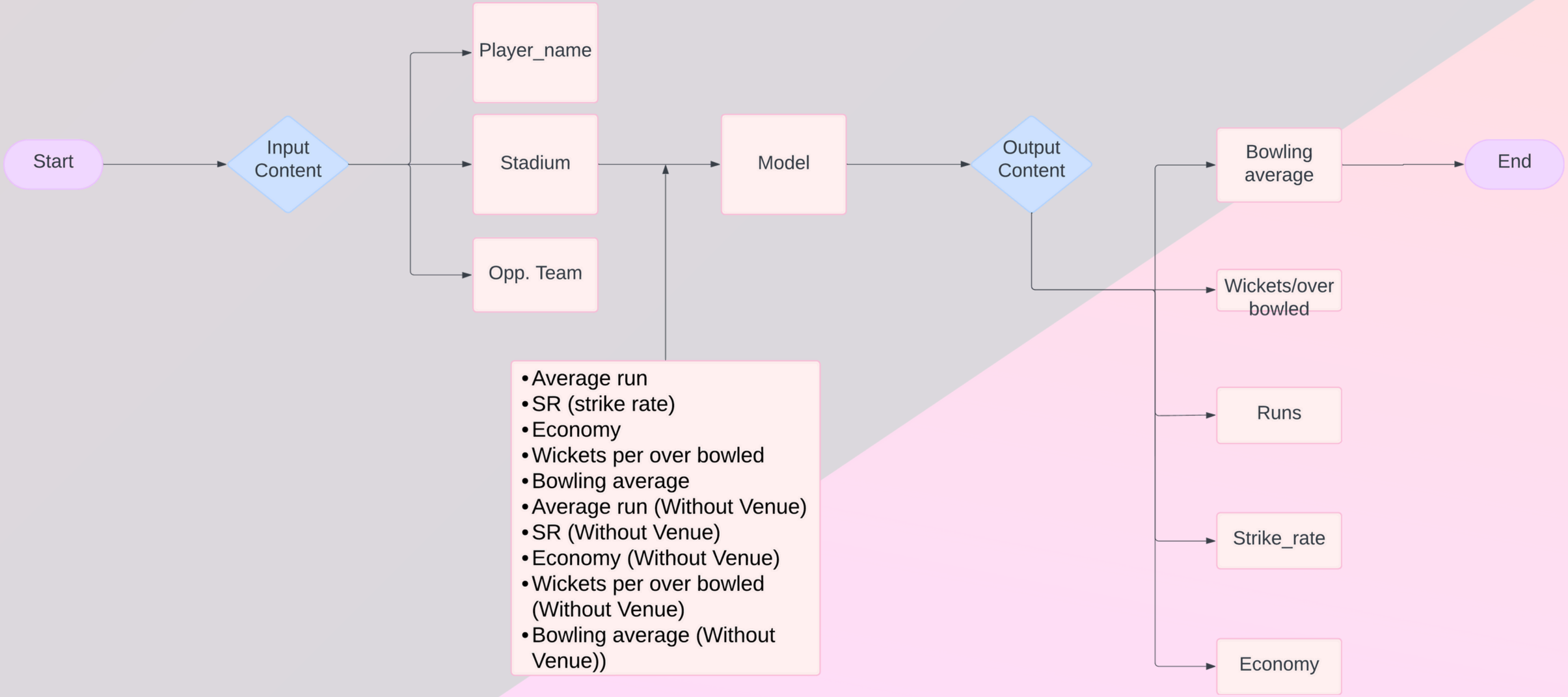
Popularity:
Cricket is one of the most popular sports globally, with a massive fan base in countries like India, Australia, England, and Pakistan.

Data Availability:
Cricket has well-structured data available from numerous sources, making it ideal for analytics and predictions.

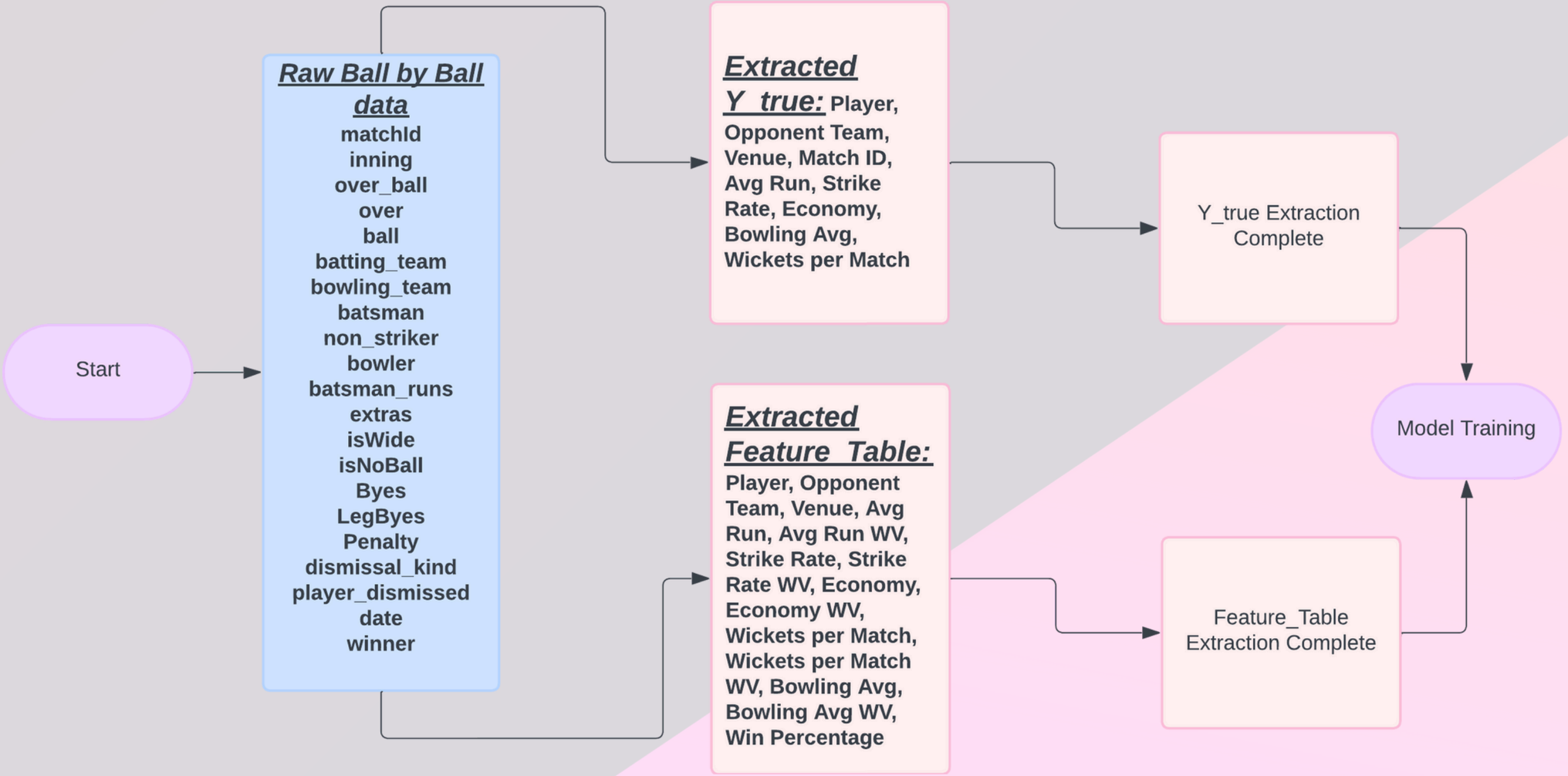
Complexity of Play:
The diverse metrics of cricket (batting, bowling, fielding) make it an interesting sport to analyze, as player performance can vary dramatically based on conditions.

Fantasy Cricket Market:
Fantasy cricket leagues are growing exponentially**(CAGR of 20.9%)**, with millions of users relying on performance predictions to make decision

Working of the Model



DataSet Description



Source: IPL Complete Dataset (2008-2024)

Methodology

1. Data Preparation

- **Input Data:** The training data consists of cricket player performance statistics such as Avg Run, Strike Rate, Economy, Bowling Avg, and Wickets per Match.
- **Data Conversion:** The lists X_train_list and y_train_list (containing input features and target values respectively) are converted to numpy arrays for easier manipulation and model training.

2. Splitting the Data

Train-Test Split: The dataset is divided into training and testing sets using an 80-20 split ratio. This helps evaluate the model's performance on unseen data.

Methodology

3. Model Initialization and Configuration

Model Selection: XGBoost (Extreme Gradient Boosting) is used for regression. The XGBRegressoris initialized with the following parameters:
objective='reg:squarederror': Specifies the loss function used for regression.
n_estimators=25: This defines the number of boosting rounds (epochs).
eval_metric='rmse': Specifies RMSE (Root Mean Squared Error) as the evaluation metric during training.

4. Training the Model

Evaluation Sets: The model is trained using the training data and evaluated on both the training and testing sets during each boosting round.

Result

RMSE for each output label:

Avg Run	**10.9**
Strike Rate	**34.6**
Economy	**1.7**
Bowling Avg	**10.6**
Wickets per Match	**0.4**

$$RMSE = \sqrt{\sum_{i=1}^{n} \frac{(\hat{y}_i - y_i)^2}{n}}$$

$\hat{y}_1, \hat{y}_2, \ldots, \hat{y}_n$ are predicted values

$y_1, y_2, \ldots, y_n$ are observed values

n is the number of observations

OutPut Window

Batting Stats Predicted

Avg Run=Number of Innings Played’/ Total Runs Scored

Strike rate = (runs scored / balls faced) * 100

Bowling Stats Predicted

Economy rate = Runs conceded / Overs bowled

Wickets per match = Wickets taken / Match Played

Bowling average = Runs given / Wickets taken

Use Cases

1. **Sports Teams & Coaches:**
    a. Predict player performance for strategy formation, substitutions, and selection.
    b. Analyze patterns in wins vs. losses to fine-tune game plans.
2. **Fantasy Leagues:**
    a. Predict fantasy points to help users make data-driven decisions.
    b. Compare player predictions to optimize fantasy team selections.
3. **Betting Platforms:**
    a. Use predictive insights for player performance to offer betting odds and analytical insights.
    b. Enhance user engagement by providing performance forecasts for individual players.

Future Enhancements

Multi-Sport Expansion:

- Currently focused on cricket, the platform can be extended to other popular sports like football, basketball, or baseball, each with its unique set of performance metrics. This expansion would attract a wider audience, offering similar predictive insights for different sports.

Live Match Integration:

- Integrating live data feeds from ongoing matches will enable real-time predictions and analytics. This can enhance user engagement by providing in-play performance forecasts for both coaches and fantasy league participants, offering updated recommendations as the match progresses.

Player Comparison Tool:

- A future enhancement could include a comparison feature where users can analyze and compare two or more players' predicted performances side by side. This would be particularly useful for fantasy league participants and coaches making selection decisions.