1. Introduction

In modern football, data analytics plays a crucial role in evaluating player performance and decision-making processes. Clubs, coaches, and analysts rely on data-driven insights to assess player quality, potential, and consistency. Exploratory Data Analysis (EDA) helps in understanding patterns, trends, and relationships within football datasets before applying advanced machine learning techniques.

This project focuses on performing Exploratory Data Analysis on professional football player data obtained from the FIFA dataset. By analyzing player attributes such as age, overall rating, potential, and technical skills, meaningful insights about football player performance can be derived.

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2. Problem Statement

The objective of this project is to analyze football player performance using Exploratory Data Analysis techniques. The project aims to identify important factors that influence a player's overall rating and understand relationships between different player attributes such as age, potential, and skill ratings.

The problem can be defined as:
"Given a dataset containing football player attributes, perform exploratory analysis to uncover patterns, correlations, and insights related to player performance."

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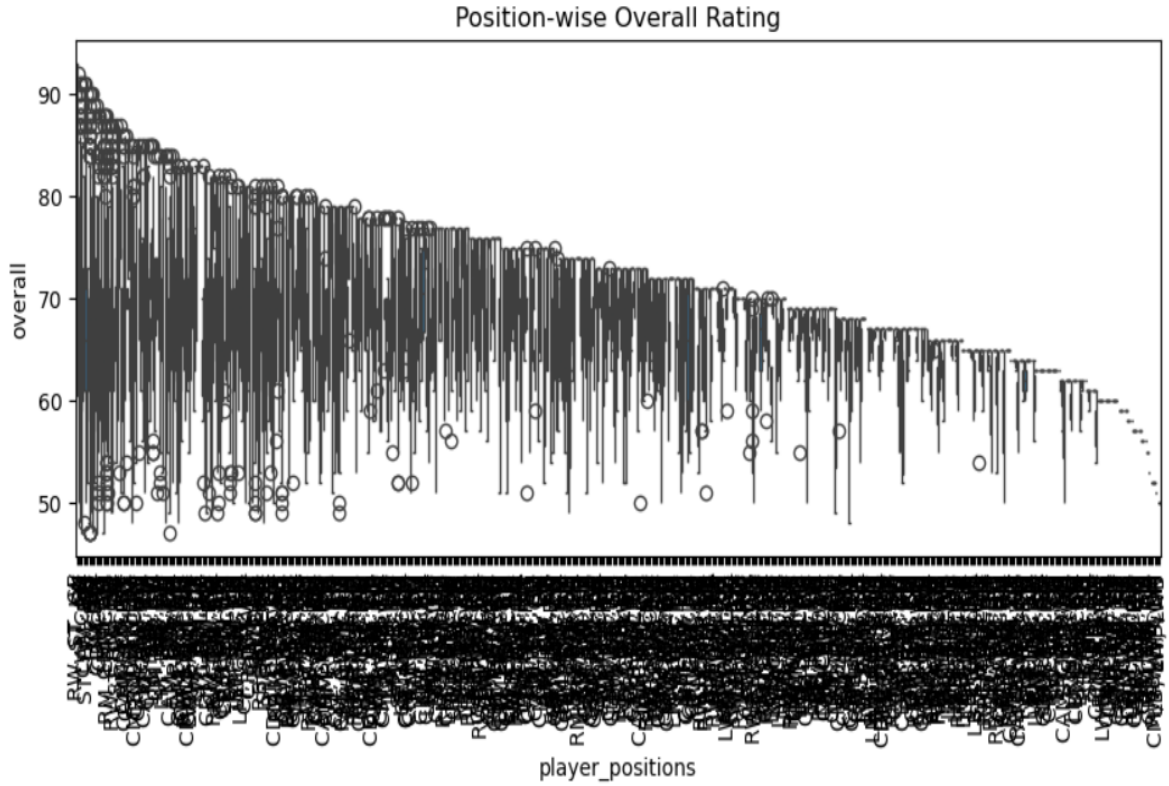
3. Results and Discussion

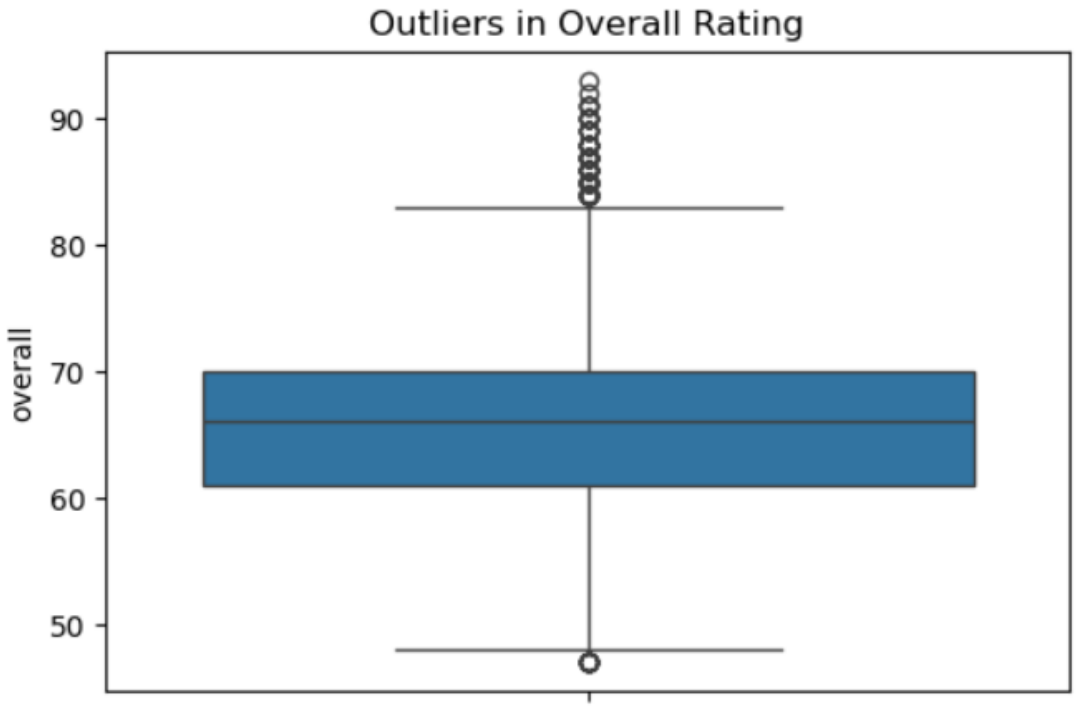
Exploratory Data Analysis was conducted on the FIFA player dataset using Python libraries such as Pandas, Matplotlib, and Seaborn.

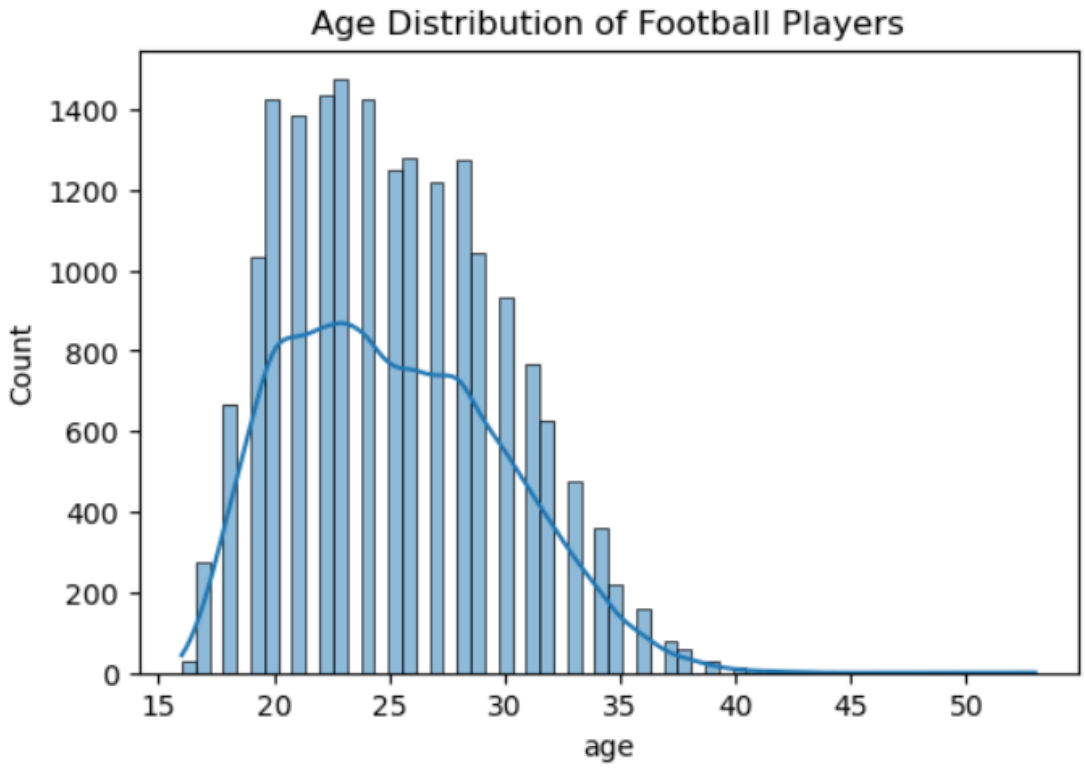
Key observations from the analysis include:

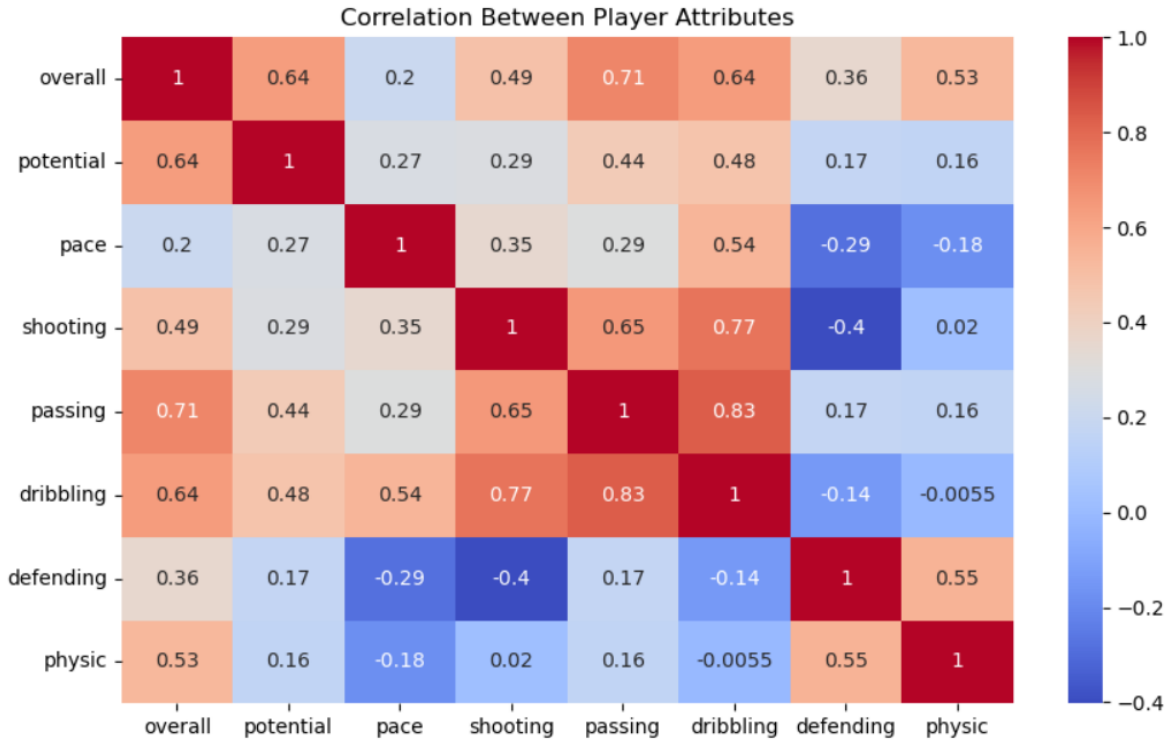
- **Age Distribution:** Most professional football players fall within the age range of 20–30 years, indicating the peak performance age group.
- **Overall Rating Distribution:** The majority of players have average overall ratings, while only a small number of elite players possess very high ratings.
- **Age vs Overall Rating:** Players generally reach peak performance in their mid-20s, after which the overall rating gradually declines.
- **Correlation Analysis:** Strong positive correlations were observed between overall rating and attributes such as potential, passing, dribbling, and shooting.
- **Position-wise Analysis:** Certain positions tend to have higher average overall ratings depending on skill requirements.

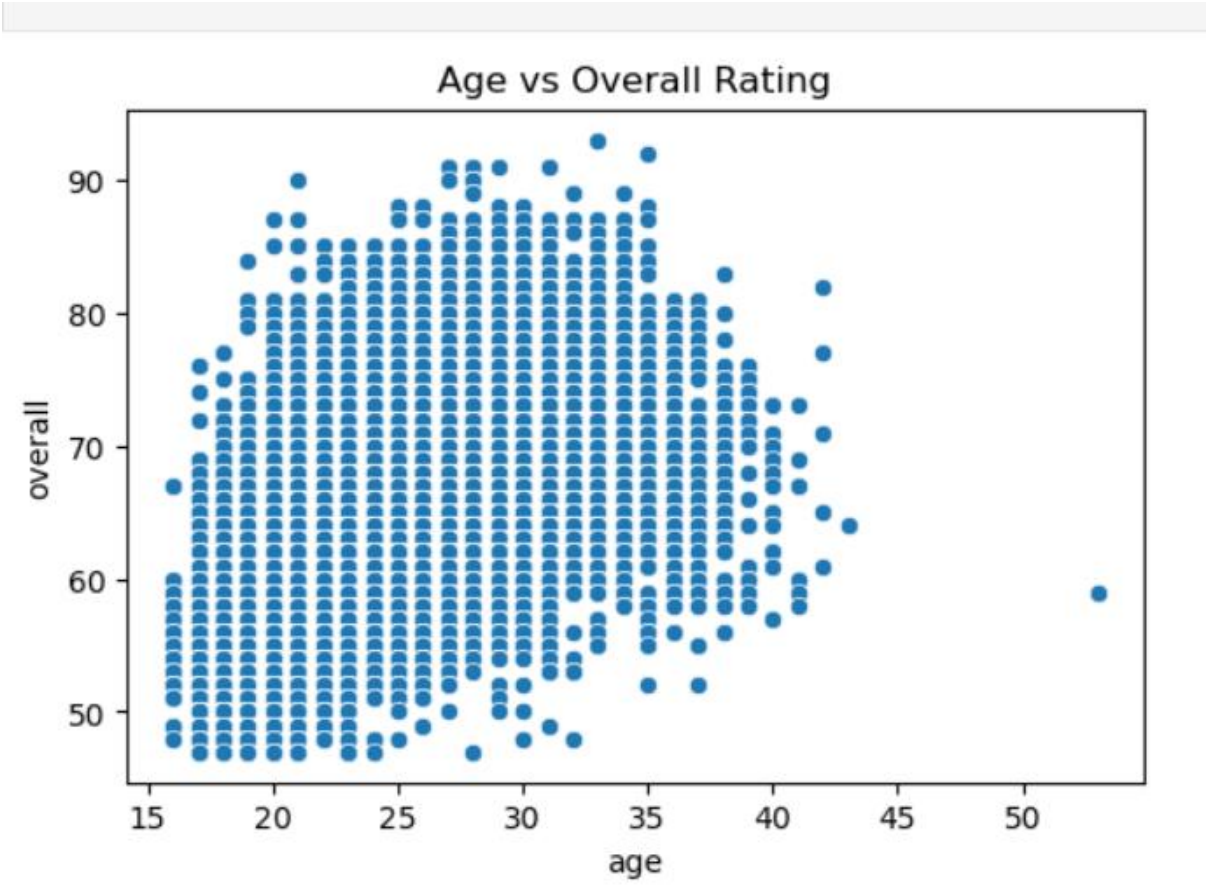
The visualizations clearly highlight how technical skills and physical attributes influence a player's performance.






Age Distribution of Football Players
Count
age
0
200
400
600
800
1000
1200
1400
15
20
25
30
35
40
45
50


Correlation Between Player Attributes
overall 1 0.64 0.2 0.49 0.71 0.64 0.36 0.53
potential 0.64 1 0.27 0.29 0.44 0.48 0.17 0.16
pace 0.2 0.27 1 0.35 0.29 0.54 -0.29 -0.18
shooting 0.49 0.29 0.35 1 0.65 0.77 -0.4 0.02
passing 0.71 0.44 0.29 0.65 1 0.83 0.17 0.16
dribbling 0.64 0.48 0.54 0.77 0.83 1 -0.14 -0.0055
defending 0.36 0.17 -0.29 -0.4 0.17 -0.14 1 0.55
physic 0.53 0.16 -0.18 0.02 0.16 -0.0055 0.55 1
overall potential pace shooting passing dribbling defending physic
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4



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4. Conclusions

This project successfully performed Exploratory Data Analysis on football player data to understand performance-related patterns. EDA helped identify key factors affecting player ratings and revealed meaningful relationships among player attributes.

The analysis demonstrates that player performance is strongly influenced by technical skills, potential, and age. Such insights can be useful for football analysts, coaches, and clubs when evaluating players.

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5. References

1. FIFA Player Dataset – Kaggle
   https://www.kaggle.com/datasets
2. Pandas Documentation – https://pandas.pydata.org
3. Seaborn Documentation – https://seaborn.pydata.org