# FIFA Player Position Prediction using Supervised Learning

## Project Summary

This project uses supervised machine learning to predict a football player's club position based on their in-game attributes. A Random Forest Classifier was trained using the FIFA 21 dataset and evaluated using the FIFA 22 dataset, simulating a real-world scenario of predicting outcomes on new, unseen data.

## Pain Point Addressed

One key pain point addressed by this project is the inefficiency of manual player position assessment in football scouting and game strategy. By predicting a player's most suitable position based on performance attributes, the model aids scouts, coaches, and analysts in making faster and more data-driven decisions.

## Data Sources

- FIFA 21 dataset (training data)
- FIFA 22 dataset (testing data)

Both datasets were sourced from Kaggle and include over 30 performance-related attributes per player.

## Data Preprocessing

- Filtered to include only outfield players (excluding Goalkeepers and substitutes/reserves).
- Removed rows with missing values in selected numeric features.
- Selected key attributes such as pace, shooting, passing, dribbling, defending, and physic, among

others.

- Encoded the target variable ('club_position') using Label Encoding.

## Modeling

- Model: Random Forest Classifier

- Features: 35 numeric attributes selected based on relevance to on-field performance.

- Training: Model was trained on FIFA 21 player data.

- Testing: Model was tested on FIFA 22 player data to measure real-world generalization.

## Evaluation Metrics

- Accuracy Score

- Classification Report (Precision, Recall, F1-score)

These metrics provide insights into the model's effectiveness in correctly predicting player positions.

## Search Functionality

An interactive function allows users to input a player's name fragment and receive a predicted club position based on their attributes, with graceful handling of missing data and edge cases.

## Conclusion

This project showcases how supervised learning can be applied to sports analytics by predicting a player's club position using key performance indicators. It reflects how machine learning can enhance talent identification, player development, and team composition strategies in professional football.