SYNOPSIS REPORT

ON

MMA FIGHTER MATCHUP PREDICTOR

BY
SIDDHARTH KSHIRSAGAR

Course: MCA I

T
c

Roll No.:24055

PRATIBHA INSTITUTE OF BUSINESS MANAGEMENT
CHINCHWAD, PUNE-411019
2024-25

4

Introduction to project

The "MMA Fighter Matchup Predictor" is a data-driven desktop application that predicts the outcome of a matchup between two MMA fighters. Users input the names of two fighters, and the system analyzes their statistics, including win percentages, fighting styles, and historical performance against similar opponents, to predict the result. The system is powered by **BeautifulSoup4** for data extraction, **Pandas** for data manipulation, and a machine learning model for predictive analysis. A graphical user interface (GUI) is built using **Tkinter** to provide an intuitive user experience.

1.1 Existing System & It's Drawbacks

Currently, MMA enthusiasts and analysts rely on manual research and subjective judgment to predict fight outcomes. This approach suffers from several limitations:

- Subjectivity in Predictions**:** Predictions are often based on personal biases and lack data-driven analysis.
- Fragmented Data Sources: Information about fighters is scattered across multiple platforms.
- Lack of Historical Context: Historical performance data against similar opponents is not readily accessible.

1.2 Purpose of System

The purpose of the system is to provide an automated and data-driven platform for predicting the outcome of MMA matchups. Users can:

1. Input the names of two fighters to analyze their statistics and performance.
2. View predictions based on key metrics like win percentages, fighting styles, and historical matchups.
3. Access insights through visualizations and a user-friendly GUI.

1.3 Project Overview (Functionality of Modules)

Data Scraping Module

- Utilize **Crawl4AI** to scrape fighter statistics, such as win/loss records, fighting styles, and opponent history, from the official UFC website.
- Organize the scraped data into a structured format using **Pandas** for further analysis.

Prediction Module

- Train a machine learning model to predict fight outcomes based on key features like win percentages, historical performance, and fighting styles.
- Compare the statistics of two fighters' input by the user to generate predictions.

Visualization Module

- Use libraries like **Matplotlib** and **Plotly** to create visualizations of fighter performance trends.
- Display comparisons of fighter stats, including win percentages, skill metrics, and historical trends, within the **Tkinter** GUI.

User Interaction Module (Tkinter)

- Build an interactive GUI using **Tkinter** where users can:
  - Input the names of two fighters.
  - View detailed statistics and visualizations for both fighters.
  - See a prediction of the matchup outcome.

2. Scope of work

2.1 Scope of Project

The project aims to assist MMA fans, analysts, and trainers by providing a centralized platform for fighter data analysis and matchup predictions. Potential future extensions could include:

- Integration with live fight updates.
- Advanced analytics features like simulated match outcomes.

2.2 Objectives

- To develop a system that predicts fight outcomes based on fighter statistics.
- To provide interactive visualizations for better understanding of matchups
- To create an intuitive user interface for easy accessibility.

2.3 Business Rules & Special Considerations

- Ethical web scraping guidelines will be followed to ensure compliance with data usage policies.
- The accuracy of predictions will depend on the quality and completeness of historical data.

- The system will use anonymized data where necessary to protect privacy.

3. Technical Solution

3.1 Technical Architecture

The system will use a standalone desktop architecture where:

- **UI Layer:** Built using **Tkinter** for user interactions.
- **Processing Layer:** Handles web scraping, data manipulation, and predictions.
- **Visualization Layer:** Generates and displays statistical comparisons and trends.

3.2 Hardware & Software Requirements

At Server Side:

Hardware Configuration

Name	Details
Processor	Intel5 or equivalent
RAM	8 GB
Hard Drive	500 GB HDD/SSD

Software Environment

Name	Details
Operating System	Windows server
Database Sever	MYSQL
Application Server	Not required
Browser	Latest version of google chrome
Framework	Tkinter for GUI

Project Guide Name

Signature