Predicting the Unpredictable: A Look into the World of Powerlifting

Milestone 1: Project Initialization and Planning Phase

The "Project Initialization and Planning Phase" marks the project's outset, defining goals, scope, and stakeholders. This crucial phase establishes project parameters, identifies key team members, allocates resources, and outlines a realistic timeline. It also involves risk assessment and mitigation planning. Successful initiation sets the foundation for a well-organized and efficiently executed machine learning project, ensuring clarity, alignment, and proactive measures for potential challenges.

Activity 1: Define Problem Statement

Problem Statement

In the world of powerlifting, predicting an athlete's performance is complex due to numerous influencing factors such as training variables, physiological data, nutrition, and psychological factors. Despite these challenges, providing accurate performance predictions can significantly benefit athletes and coaches by optimizing training regimens and improving competition outcomes.

Problem statement CLICK HERE

Activity 2: Project Proposal (Proposed Solution) Project Proposal: "Predicting the Unpredictable: A Look into the World of Powerlifting"

The proposed project aims to leverage machine learning for more accurate predictions of powerlifting performance. By utilizing a comprehensive dataset that includes demographic information, training variables, physiological data, nutrition, and psychological factors, the project seeks to develop a predictive model that can optimize training regimens and improve competition outcomes. This initiative aligns with the objective to enhance decision-making, reduce injury risks, and streamline training operations, ultimately improving athlete performance and satisfaction.

Powerlifting Project proposal: click here

Activity 3: Initial Project Planning

Initial Project Planning involves outlining key objectives, defining scope, and identifying stakeholders for the powerlifting performance prediction system. It encompasses setting timelines, allocating resources, and determining the overall project strategy. During this phase, the team establishes a clear understanding of the dataset, formulates goals for analysis, and plans the workflow for data processing. Effective initial planning lays the foundation for a systematic and well-executed project, ensuring successful outcomes.

Powerlifting Project planning: click here

Milestone 2: Data Collection and Preprocessing Phase

Activity 1: **Data Collection Plan, Raw Data Sources Identified, Data Quality Report**

Data Collection Plan: Develop a comprehensive plan to collect relevant powerlifting data. Identify key sources such as Kaggle, official competition databases, and other reputable platforms that provide detailed powerlifting records, including lifter details and performance metrics. **Data Sources Identified**: Raw Clearly list all the identified sources and ensure data quality by verifying the authenticity and accuracy of the data. Address any missing values and ensure compliance with ethical guidelines.

Data Quality Report: Document the steps taken to ensure data quality, including verification processes and handling of missing data. Ensure the data is clean, accurate, and reliable for predictive modelling

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Powerlifting Data Collection Report: click here

Activity 2: Data Quality Report

Dataset Overview: Provide an overview of the dataset, including the sources and key attributes related to lifters and their performance.

Data Quality Verification: Detail the process of verifying data quality, addressing missing values, and adhering to ethical guidelines.

Powerlifting Data Quality Report: click here

Activity 3: Data Exploration and Preprocessing

Data Exploration: Analyze the dataset to understand patterns, distributions, and outliers. Use visualizations to highlight key insights.

Preprocessing Tasks: Handle missing values, scale numerical data, and encode categorical variables. Organize the dataset for subsequent analysis and machine learning model development.

Powerlifting Data Exploration and Preprocessing Report: click here

Milestone 3: Model Development Phase

Activity 1: Feature Selection Report

Feature Selection: Identify and justify the selection of specific features (e.g., lifter's age, weight class, historical performance) that are crucial for predicting powerlifting outcomes**.**

Powerlifting Feature Selection Report: click here

Activity 2: Model Selection Report

Model Selection: Choose suitable models (e.g., Random Forest, Decision Tree, KNN, XGB) for predicting powerlifting performance. Evaluate the strengths and weaknesses of each model in the context of your project.

Powerlifting Model Selection Report: click here

Activity 3: Initial Model Training Code, Model Validation and Evaluation Report

Model Training: Implement the selected models and train them using the powerlifting dataset

Validation and Evaluation: Assess the performance of the models using metrics like accuracy, precision, and recall. Document the findings in a detailed report.

Powerlifting Initial Model Training code: click here

Milestone 4: Model Optimization and Tuning Phase: click here

Activity 1: Hyperparameter Tuning Documentation

Hyperparameter Tuning: Fine-tune the selected models to achieve optimal performance. Document the tuning process and the rationale for choosing specific hyperparameters**.**

Ref. template: Click Here Powerlifting Hyperparameter Tuning Documentation: Click Here

Activity 2: Performance Metrics Comparison Report

Performance Comparison: Compare the performance metrics of the baseline and optimized models. Highlight the improvements achieved through tuning.

Ref. template: Click Here Powerlifting Performance Metrics Comparison Report: Click Here

Activity 3: Final Model Selection Justification

Final Model Selection: Justify the selection of the final model based on its performance metrics and alignment with project objectives.

Ref. template: Click Here

Powerlifting Final Model Selection Justification:

Click Here

Milestone 5: Project Files Submission and Documentation

Project Files Submission: Submit all project files and code on a platform like GitHub. Provide a detailed documentation of the project.

Project Files Submission and Documentation: click here

Milestone 6: Project Demonstration

Project Demonstration: Record a video explaining and demonstrating the project. Highlight key aspects of the project, including data collection, preprocessing, model development, and performance evaluation.

Powerlifting Project Demonstration: click here

This structured approach ensures a thorough and organized development process for your project, "Predicting the Unpredictable: A Look into the World of Powerlifting."