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*ECE 5984, Project Proposal*

**KickStats: Visualizing Live Football Scores**

**Purpose**

The purpose of this project is to provide football enthusiasts with real-time access to live scores of multiple football matches from various leagues and competitions. It addresses the problem of football fans needing a convenient and centralized platform to track ongoing matches, their scores, and relevant statistics. By offering a streamlined visualization of live scores, this project aims to enhance the football-watching experience and keep fans informed.

**Key Questions and Objectives**

1. **Real-time Score Updates:** How can we efficiently collect and deliver live scores from multiple football matches?
2. **Data Integration:** How can we seamlessly integrate data from the API-Football API into our data pipeline?
3. **Data Storage:** What is the best way to store the real-time football match data for future analysis and visualization?
4. **Data Transformation:** How can we transform the raw data into a format suitable for analysis and visualization?
5. **Visualization:** What tools and methods can we use to create user-friendly and interactive visualizations of live football match scores?

**Visualization**

1. **Real-time Scoreboard**:
   * A dynamic Tableau scoreboard displays live match scores.
   * Scores update in real-time using Tableau's live data connections to the football API.
2. **Interactive Dashboards:**
   * Filtering matches by league, date, or team.
   * Sorting matches by score, time remaining, or match status.
   * Viewing detailed match info by clicking on specific matches.
3. **Match Details:**

* When users click on a specific match in the scoreboard or use filters, display match details in an interactive visualization.
* Include team logos, goal scorers, statistics (e.g., possession, shots on goal), and any relevant events (e.g., yellow/red cards).

**Pipeline and Methods**

For this project, we will use the following Stream-Visualization pipeline for the [API-FOOTBALL](https://www.api-football.com/) dataset:

1. **Data Ingestion:** We will retrieve real-time football match data from the API-Football API.
2. **Stream Ingestion (Extract and Load):** Using Apache Kafka, we will ingest and stream the live data to ensure we have the latest scores and updates.
3. **Data Storage:** The ingested data will be stored in Amazon S3, forming a data lake that allows for scalable and cost-effective storage.
4. **Data Transformation:** Pandas, a powerful Python library for data manipulation, will be used to transform the raw data into a structured format suitable for analysis.
5. **Data Warehousing:** The transformed data will be further stored in an Amazon S3 bucket, serving as our data warehouse for historical data analysis.
6. **Relational Database:** We will use Amazon RDS or MySQL to maintain a relational database for structured data storage and querying.
7. **Data Analytics:** Tableau will be employed to create interactive dashboards and visualizations, enabling users to access live football match scores with ease.

**Expected Results**

The final result of this project will be a user-friendly and interactive platform that provides real-time access to football match scores from various leagues and competitions. Users will be able to:

* View live scores of multiple football matches simultaneously.
* Access match details, including team information, goal scorers, and match statistics.
* Customize their view to focus on specific matches or leagues of interest.
* Interact with dynamic visualizations and charts.
* Stay updated with the latest scores without the need for constant manual refreshing.

By achieving these objectives, we aim to offer football fans a convenient and engaging solution for tracking live scores and enjoying the excitement of football matches in real-time.