

Tennis Data Analytics: Sport Radar API & Streamlit Dashboard

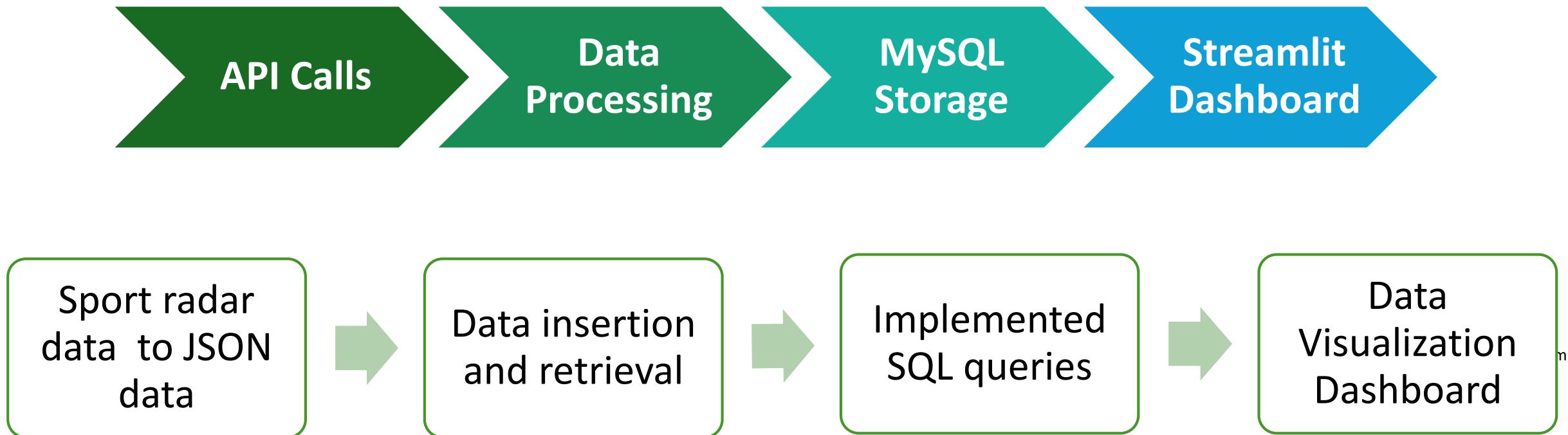
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Problem Statement

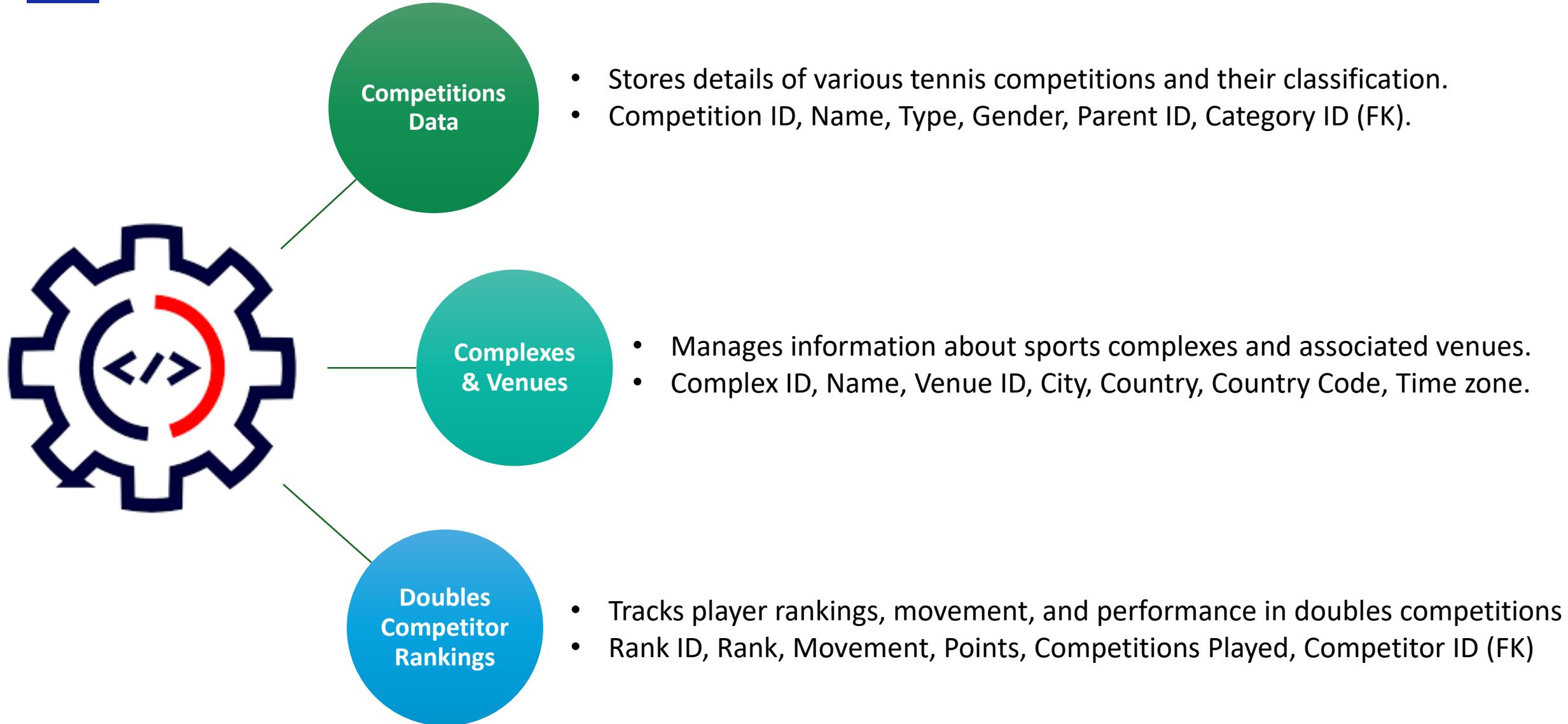
- ◇ **Comprehensive Sports Data Solution** – Manage, visualize, and analyse sports competition data from the Sport Radar API.
- ◇ **Automated Data Processing** – Parse **JSON** data, structure it in a **relational database**, and ensure efficient storage.
- ◇ **Tournament & Event Insights** – Provide **hierarchical competition structures**, event breakdowns, and key analytics.
- ◇ **Real-Time Analytics & Trends** – Assist analysts, organizations, and enthusiasts in exploring **competition trends** dynamically.
- ◇ **Interactive Visualization** – Enable **intuitive dashboards** for deeper insights into tournaments and rankings.
- ◇ **Enhanced Decision-Making** – Deliver **detailed, structured data** to facilitate better sports analysis and engagement.



System Architecture Diagram



Data Collection (API Integration)



Data Processing & Transformation

API Integration

Used Python requests to fetch real-time data from Sport Radar API

Data Parsing

Extracted JSON response and converted it into structured pandas Data Frames

Data Cleaning

Handled missing values, normalized formats, and ensured consistency

Database Storage

Inserted cleaned data into MySQL tables using MySQL Connector

Visualization

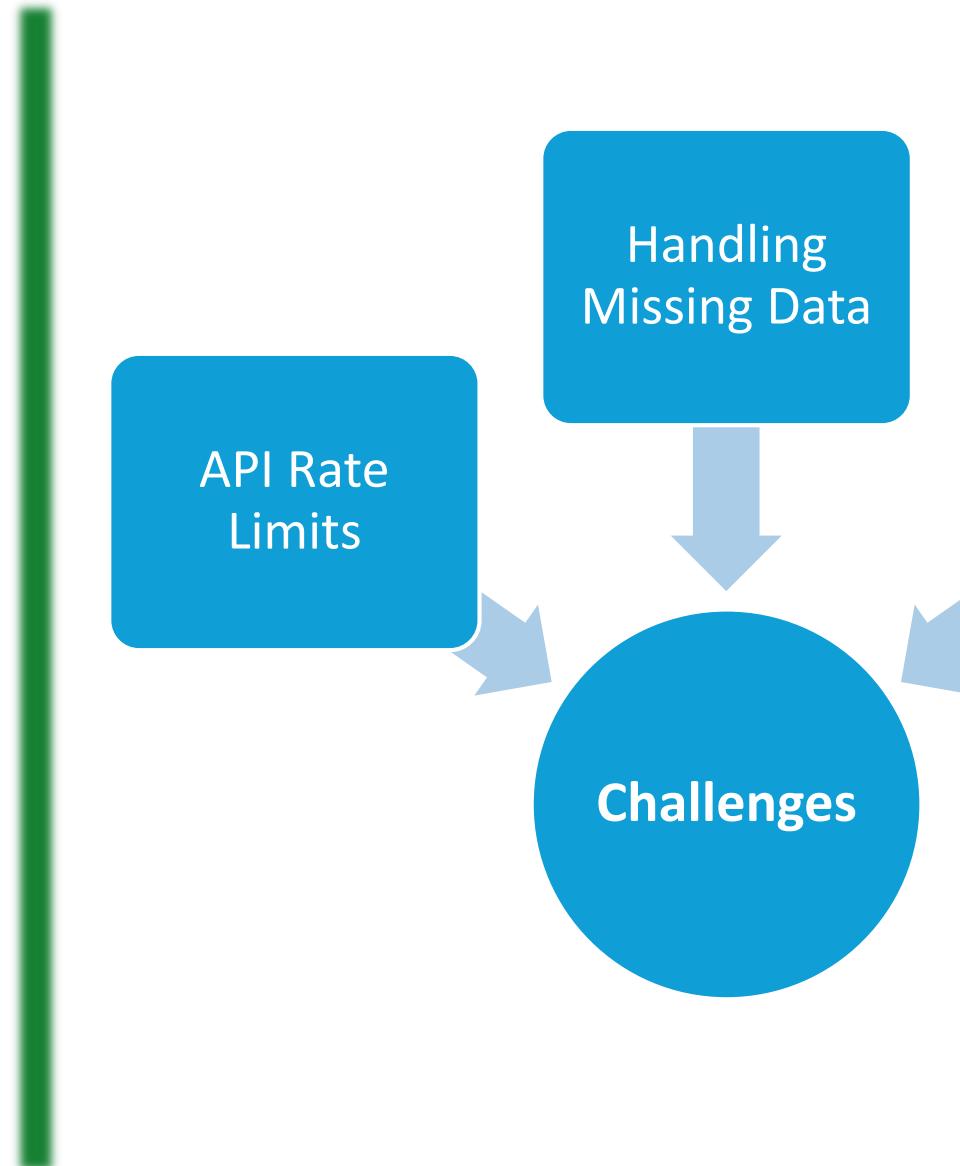
Connected data to Streamlit for interactive dashboards.

API Rate Limits

Handling Missing Data

Data Normalization

Challenges



Python code & SQL Data

```

import requests
import json

# API Configuration
API_KEY = "vPAg0e8ZLcCjUWQdDrIlxcQ60PqH81i4DqzrjAoX"
BASE_URL = "https://api.sportradar.com/tennis/trial/v3/en"

def fetch_data(endpoint): 1usage
    """Fetch data from SportRadar API and return JSON."""
    url = BASE_URL + "/" + endpoint + ".json?api_key=" + API_KEY
    response = requests.get(url)

    if response.status_code == 200:
        return response.json()

    print("Error:", response.status_code, response.text)
    return None

# Fetch & Display Competitions
competitions = fetch_data("competitions")
if competitions:
    print(json.dumps(competitions, indent=2))
else:
    print("No data received.")

```



```

import mysql.connector
from mysql.connector import Error
try:
    # Provide your correct credentials here
    connection = mysql.connector.connect(
        host="localhost",
        user="root",
        password="Sham@1234"
    )
    if connection.is_connected():
        print("Connection to MySQL server was successful!")

        # Create a cursor object to execute SQL queries
        cursor = connection.cursor()

        # SQL query to create a new database
        create_database_query = "CREATE DATABASE IF NOT EXISTS tennis_db"
        cursor.execute(create_database_query)
        print("Database 'tennis_db' created successfully!")

except Error as e:
    print(f"Error: {e}")
finally:
    # Close the connection
    if 'connection' in locals() and connection.is_connected():
        connection.close()
        print("MySQL connection is closed.")

```

```

import mysql.connector
import requests

# ✓ API Configuration
API_KEY = "vPAg0e8ZLcCjUWQdDrIlxcQ60PqH81i4DqzrjAoX"
BASE_URL = "https://api.sportradar.com/tennis/trial/v3/en"

# ✓ Connect to MySQL
def get_db_connection(): 3 usages
    return mysql.connector.connect(
        host="localhost",
        user="root",
        password="Sham@1234",
        database="tennis_db"
    )

# ✓ Create Tables
def create_competitions_tables(): 1 usage
    connection = get_db_connection()
    cursor = connection.cursor()

    # Create Categories Table
    cursor.execute("""
        CREATE TABLE IF NOT EXISTS categories (
            category_id VARCHAR(50) PRIMARY KEY,
            category_name VARCHAR(100) NOT NULL
    """)

```

	competition_id	competition_name	parent_id	type	gender	category_id
▶	sr:competition:10025	ITF Men Stara Zagora, Bulgaria Men Singles	sr:competition:10023	singles	men	sr:category:785
	sr:competition:10027	ITF Men Stara Zagora, Bulgaria Men Doubles	sr:competition:10023	doubles	men	sr:category:785
	sr:competition:10031	ITF Men Sibiu, Romania Men Singles	sr:competition:10029	singles	men	sr:category:785
	sr:competition:10033	ITF Men Sibiu, Romania Men Doubles	sr:competition:10029	doubles	men	sr:category:785
	sr:competition:10037	ITF Men Busto Arsizio, Italy Men Singles	sr:competition:10035	singles	men	sr:category:785
	sr:competition:10039	ITF Men Busto Arsizio, Italy Men Doubles	sr:competition:10035	doubles	men	sr:category:785
	sr:competition:10043	ITF Men Sabac, Serbia Men Singles	sr:competition:10041	singles	men	sr:category:785

Streamlit Dashboard Features

Filters & Navigation

Filter Competitors

Search Competitor by Name

Filter by Rank: 1 to 501

Filter by Points: 107 to 10750

Filter by Country: All

Run SQL Queries

Enter SQL Query:

```
SELECT * FROM competitors WHERE country = 'Spain'
```

Tennis Competitor Rankings Dashboard

Total Competitors: 1000 Countries Represented: 80 Highest Points: 10750

Competitor Data

competitor_id	name	country	country_code	abbreviation	rank	movement	points	competitions_played	
0	sr:competitor:49363	Pavic, Mate	Croatia	HRV	PAV	1	0	7,620	23
1	sr:competitor:51836	Arevalo-Gonzalez, Marcelo	El Salvador	SLV	ARE	1	0	7,620	23
2	sr:competitor:637970	Patten, Henry	Great Britain	GBR	PAT	3	0	7,355	28
3	sr:competitor:14898	Heliovaara, Harri	Finland	FIN	HEL	4	0	7,205	26
4	sr:competitor:36593	Krawietz, Kevin	Germany	DEU	KRA	5	0	6,330	21
5	sr:competitor:52293	Putz, Tim	Germany	DEU	PUT	6	0	6,240	20

Country-Wise Analysis

	country	total_competitors	avg_points
0	USA	93	956.1935
1	Neutral	65	627.2462
2	France	54	567.537
3	Japan	54	434.037
4	Great Britain	52	849.2115
5	Australia	49	786.1633
6	Czechia	41	766.7805
7	Italy	40	879.175
8	Netherlands	33	756.0909
9	China	33	771.8788

Competitor Details

Select a Competitor: Granollers, Marcel

Name: Granollers, Marcel

Rank: 9

Movement: 0

Points: 6020

Competitions Played: 14

Country: Spain

id	sr:competitor	name
644	sr:competitor:133662	Badosa, Paula
667	sr:competitor:119216	Herrero Linana, Alicia

Leaderboards

Top-Ranked Competitors

	name	rank	country
8	Granollers, Marcel	9	Spain
524	Bucsa, Cristina	25	Spain
538	Sorribes Tormo, Sara	39	Spain
576	Cavalle-Reimers, Yvonne	77	Spain
115	Martinez, Pedro	115	Spain
126	Munar, Jaume	126	Spain
132	Martos Gornes, Sergio	132	Spain
133	Cervantes, Inigo	133	Spain
636	Romero Gormaz, Leyre	137	Spain
644	Badosa, Paula	145	Spain

Competitors with Highest Points

	name	points	country
8	Granollers, Marcel	6,020	Spain
524	Bucsa, Cristina	3,174	Spain
538	Sorribes Tormo, Sara	2,248	Spain
576	Cavalle-Reimers, Yvonne	1,063	Spain
115	Martinez, Pedro	730	Spain
126	Munar, Jaume	640	Spain
132	Martos Gornes, Sergio	621	Spain
133	Cervantes, Inigo	615	Spain
636	Romero Gormaz, Leyre	588	Spain
644	Badosa, Paula	552	Spain

Visualizations

Top 10 Competitors by Points

Competitor	points
Granollers, Marcel	~6000
Bucsa, Cristina	~3200
Sorribes Tormo, Sara	~2200
Cavalle-Reimers, Yvonne	~1000
Martinez, Pedro	~800
Munar, Jaume	~700
Martos Gornes, Sergio	~600
Cervantes, Inigo	~600
Romero Gormaz, Leyre	~600
Badosa, Paula	~600

Future Scope



Advanced Optimization: Ai-Driven Predictive analytics for player performance trends and match outcomes.



UI Enhancements: Real-time data visualization updates and interactive filtering for better user experience



Data Integration: Seamless AI expansion to include historical data and advanced event insights.



Automated Ranking System Generation: Machine learning-based ranking adjustments and competitor performance tracking.



Standards Compliance: Ensuring compatibility with global sports data standards and federations.



Cloud-Based Collaboration: Real-time database access and multi-user dashboard for enhanced analytics.





Thank you!

Data is the new game-changer—unlocking insights, elevating strategy, and redefining tennis analytics