**Olympic Trends & Future Projections: A Data-Driven Analysis for 2028**

**Course Name:** DA6223 - Data Analytics Tools & Techniques

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**Data Sources**:

* **Historical Olympics Data (2000–2020)**: [Kaggle Olympic Games Medals Dataset](https://www.kaggle.com/datasets/piterfm/olympic-games-medals-19862018)
* **2024 Olympics Data**: [Paris Olympics 2024 Games Dataset](https://www.kaggle.com/datasets/sajkazmi/paris-olympics-2024-games-dataset-updated-daily)

**1. Project Background**

The aim of this project is to analyze the **historical Olympics data** from 2000 to 2024 and **predict future trends** for the **2028 Summer Olympics** in Los Angeles. We focus on participation trends, medal count predictions, gender parity, and emerging countries to provide data-driven insights into how the Olympics may evolve in 2028.

**Key Goals:**

* Analyze historical Olympics trends between 2000 and 2024.
* Conduct a deep dive into the **2024 Paris Olympics** to understand key trends and insights.
* Provide **predictions for the 2028 Los Angeles Olympics** based on observed trends, historical data, and the impact of the host advantage and geopolitical factors.

**2. Data Cleaning and Preprocessing**

* **Handling Missing Values**: Replaced zeros in the athlete\_year\_birth column with null values to prevent skewed results during age-based analysis.
* **Filtering Data**: Focused on Summer Olympics data from 2000 to 2024 to maintain consistency in analysis.
* **Standardizing Country Names**: Standardized country names across datasets to ensure accuracy and consistency.
* **Merging Datasets**: Combined multiple datasets (Olympic Results, Athletes, Hosts) to create a comprehensive master dataset for analysis.
* **Adding New Columns**: Added Medal Count and Medal Points columns, where medals were assigned points: Gold = 3, Silver = 2, Bronze = 1.
* **Gender Classification**: Created a Gender column based on event titles for analyzing gender participation and performance

**3. Historical Analysis (2000-2020)**

This section covers key historical trends in Olympic participation, gender disparity, medal counts, and dominant countries across the 2000 to 2020 Olympics.

**3.1 Olympic Participation:**

* **Gender Disparity**: Male participation consistently exceeded female participation, reflecting a historical gender disparity in sports.
* **Top Participating Countries**: The USA led participation for most years, with China and Russia consistently in the top 3.
* **Peak Participation Years**: Participation peaked around **2008–2012**, and saw a decline in 2016 (Zika Virus concerns) and 2020 (COVID-19 pandemic).

**3.2 Dominant Countries in Medal Counts:**

* **USA**: The USA led in medal counts for most of the years, peaking at **121 medals** in 2016.
* **China and Russia**: These countries also performed strongly, especially in 2004 and 2008 Olympics.
* **Declining Trends**: Some countries, such as **France (Athletics)** and **Russia (Athletics)**, showed a decline in certain sports.

**3.3 Sports Trends:**

* **Uptrends**: Sports like **Swimming (England)** and **Judo (France)** showed growth in performance over the years.
* **Downtrends**: Some sports, such as **Athletics (France)** and **Athletics (Russia)**, experienced declines in the medal tally.

**4. Deep Dive: Analysis of the Paris 2024 Olympics**

**4.1 Gender Parity and Participation:**

* **Gender Equality Milestone**: The participation between male and female athletes was nearly equal in 2024, marking significant progress in gender parity.
* **Medal Distribution**: The distribution of medals between genders showed positive progress, although undefined gender entries pointed to data collection issues that need to be addressed.

**4.2 Dominant Countries:**

* **United States (USA)**: The USA dominated in all medal categories, surpassing **200 medals**. This trend aligns with the USA’s consistent athletic investment and high-performance programs.
* **France (FRA)** and **China (CHN)**: Both countries maintained high-performance levels, winning significant numbers of medals, with France showing consistency in **Judo** and **Cycling**.
* **Australia (AUS)**: Australia demonstrated consistency across all medal types, showing strong performances in **Swimming** and **Athletics**.

**4.3 Sports Insights:**

* **USA**: Strong performance across all medal categories due to extensive sports infrastructure and investments in athletic programs.
* **Insights for Aspiring Nations**: Countries looking to improve their Olympic performance can learn from USA’s systematic approach to sports development.

**4.4 Conclusions from Paris 2024:**

* The results from Paris 2024 underscore the importance of gender inclusivity, strong athletic infrastructure, and consistent performance across a variety of sports. The emerging **gender parity** and the performance of countries like the **USA**, **France**, and **China** provide valuable insights for the future of the Olympic Games.

**5. 2028 Predictions**

**5.1 Participation Trends:**

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* **Total Participation Growth**: A 7% increase in Olympic participation is expected from 2024 to 2028, driven by growth in women’s sports and emerging nations.
* **Female Participation**: Female participation is projected to reach parity with male participation by 2028, marking a milestone in gender inclusion.
* **Male Participation Plateau**: Male participation is expected to stabilize, while female and mixed-gender categories will continue to grow.

**5.2 Top Countries by Total Medal Forecast:**

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* **USA:** Projected to lead with 129 medals, driven by historical performance trends. Additionally, the host advantage typically results in a 16% increase in medal count for host countries.
* **China**: Expected to secure 90 medals, excelling in Gymnastics, Diving, and Table Tennis.
* **Great Britain**: Predicted to win 70-80 medals, with strengths in Athletics, Cycling, and Swimming.
* **Japan**: Forecasted to win 60-70 medals, particularly in Judo, Wrestling, and Swimming.
* **France**: Likely to secure 60-70 medals, with strong performances in Judo, Cycling, and Athletics.
  1. **Historically Medal yielding Sports and Predicted Top performers**

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The predicted leaders for the top medal-yielding sports in the 2028 Summer Olympics are:

* **Gymnastics, Athletics, and Swimming**: The United States (USA) is expected to remain dominant in these sports, backed by consistent top-tier performances and a strong athletic infrastructure.
* **Cycling and Rowing**: Great Britain is predicted to continue its dominance, drawing on historical success and expertise in these events.
* **Judo and Wrestling**: Japan is likely to maintain its excellence in these sports, with deep cultural ties and a tradition of success.
* **Boxing**: Chinese Taipei is expected to perform strongly, building on recent successes and growth in the sport.
* **Fencing**: With Russia's ban, countries like France, Italy, and Germany are poised to take advantage and perform better in fencing.
* **Shooting**: China is forecasted to continue its dominance in shooting, relying on historical strength and investment in training.

**5.4 Impact of Russia’s Absence:**

With Russia's ban from certain events, **USA**, **China**, **France**, and **Germany** could gain further advantages in sports traditionally dominated by Russia, such as **Fencing**, **Wrestling**, and **Gymnastics**. This shift is expected to impact on the overall medal distribution in the 2028 Olympics.

**5.5 Emerging Countries:**

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* **Serbia**: Serbia is expected to show growth, particularly in Tennis and Water Polo, potentially securing over 40 medals.
* **Israel**: With a strong emphasis on Judo and Sailing, Israel is predicted to earn around 35 medals.
* **Hong Kong**: Projected to win approximately 20 medals, with a focus on Table Tennis and Badminton.

**5.6 New Sports:**

* **Cricket**: India and Pakistan are expected to perform well in Cricket, a new addition to the Olympics gaining global attention.
* **Squash**: Egypt and England are predicted to lead in Squash, which is now recognized as an official Olympic sport.
* **Flag Football and Lacrosse**: As newly introduced Olympic sports, Flag Football and Lacrosse provide emerging nations with opportunities to increase their medal tallies.

**6. Conclusion**

The **2028 Summer Olympics** in Los Angeles are expected to be highly competitive, with **USA** projected to lead the medal tally, followed by countries like **China**, **Germany**, **Japan**, and **France**. The **absence of Russia** will shift the balance in several key sports, providing new opportunities for other countries. **Emerging sports** and **emerging countries** are expected to play a pivotal role, further diversifying the Olympic medal landscape.

The insights gained from the **2024 Olympics**, along with the projections for 2028, provide a comprehensive outlook on the future of the Games, emphasizing progress in **gender equality**, **global participation**, and the growing influence of **new sports**.