

## **Project Report:** Advanced Data Management

### **Participants:**

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### **Introduction**

The aforementioned project for the subject Advanced Data Management entails the analysis of information related to the Olympic games – particularly covering historical data of 120 years, from 1896 to 2016. Through the project, we have gone through multiple iterations, and have documented every phase with supplementing our submission with python files that were originally used as well. Also, with our files we have uploaded a presentation that we intend to present during the submission on the specific date. For working on this project, we used github folder, where the codes were worked upon together, and can be found [here](#).

We have uploaded two files, [ADM Project Final.py](#) and [ADM Project Final-UniversityCluster.py](#). The file '[ADM Project Final-UniversityCluster](#)' has been programmed to provide adequate results on the server used for our course, since we observed that a few libraries we have used in our project were not operational on the course cluster. Nevertheless, we have provided two files to ensure that they work in the desired manner offline, and in the appropriate method online (the University Cluster).

### **Dataset**

Original (Kaggle): [Click Here](#)  
Modified: [Click Here](#)

The project utilizes the modified version, and a slide within our presentation covers the modifications that were made.

### **Workload**

The workload for our project has been identified as following:

- Query 1: Enlist the number of medals won by each country by each session
- Query 2: Highlight which countries dominate each of the two sessions
- Query 3: Total medal distribution over the years
- Query 4: Highest and lowest medal count so far by country
- Query 5: Highlight the ratio of female to male participation over the years
- Query 6: Highlight the all time ratio of female to male participation amongst top participating countries
- Query 7: Representation of every country in each sport
- Query 8: Top 10 participating countries for each session
- Query 9: Top 10 participating countries all time
- Query 10: Highest participation over the years, and participation over the years
- Query 11: Highest and lowest 10 (by country) average weights and heights
- Query 12: Top 10 athletes by medal count, and medal breakdown
- Query 13: Top 10 gold medal winners
- Query 14: Top 10 athletes with most years participated
- Query 15: Youngest and oldest athletes of all time
- Query 16: Top 10 athletes with most number of sports participated
- Query 17: Swimmers with higher than the average height who have won medals
- Query 18: Weightlifters with higher than the average weight who have won medals
- Query 19: Cities where the olympics have been hosted the most number of times
- Query 20: Average height and weight of athletes over 10 year intervals
- Query 21: Various details on olympic art competitions
- Query 22: Summer olympics sport and event diversity through the years
- Query 23: Winter olympics sport and event diversity through the years

The above mentioned workload helps observe interesting patterns and trends pertaining to the Olympic games.

## Instructions

Shareable drive link with the dataset can be found [here](#). This is the modified version, as has been mentioned above.

### For **ADM\_Project\_Final.py**:

Code utilizes findspark and pyspark and requires environmental variables for spark and java homes. Developed on our local machines to utilize python libraries such as matplotlib.

Run ADM\_Project\_Final.py as all the required code is contained in this python file.

Enter the filepath of the given dataset 'DataSetFinal.csv' when requested.

If issues concerning filepath format arise in the python file try adding the filepath as shown in the spark.read.csv function in line 487 and then running line 488.

Upon succesful filepath entry and dataframe creation when requested enter a query #(1-23) to execute the query, 'h' to list the queries, or 'q' to quit.

### For **ADM\_Project\_Final-UniversityCluster.py**:

Code runs in the university cluster utilizing pyspark.

The filepath is set in line 361. Currently set as:

hdfs://master:9000/user/user9/olympics/input/DataSetFinal.csv.

Can be changed if desired, but be sure to use the provided 'DataSetFinal.csv' file.

To display the available queries run the following command

```
spark-submit --master yarn ADM_Project_Final-UniversityCluster.py h
```

To execute a query run the following command

```
spark-submit --master yarn ADM_Project_Final-UniversityCluster.py <query #>
```

### Example command and output:

```
spark-submit --master yarn ADM_Project_Final-UniversityCluster.py 13
```

```
+-----+-----+
|Name                                     |Gold medals|
+-----+-----+
|Michael Fred Phelps, II                 |23|
|"Raymond Clarence ""Ray"" Ewry"         |10|
|Mark Andrew Spitz                       |9|
|Larysa Semenivna Latynina (Diriy-)      |9|
|"Frederick Carlton ""Carl"" Lewis"     |9|
|Paavo Johannes Nurmi                    |9|
|Birgit Fischer-Schmidt                  |8|
|Usain St. Leo Bolt                       |8|
|"Matthew Nicholas ""Matt"" Biondi"      |8|
|"Jennifer Elisabeth ""Jenny"" Thompson (-Cumpelik)" |8|
+-----+-----+
```