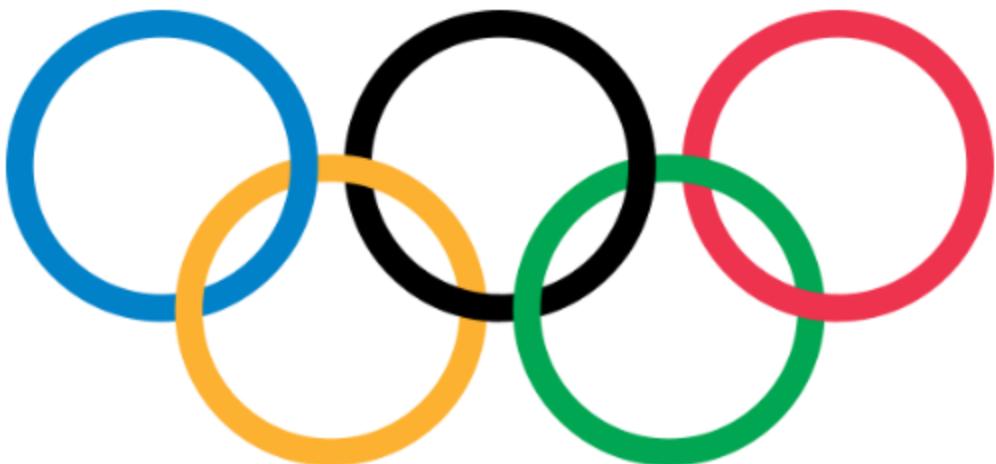




# **Discovering the Olympics Games**

**A historical tour to the world leading sports  
competition**

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## 1. Introduction

### 1.0.1 The Olympic Games as a Sports Event

The Olympics Games is a major international multi-sport event, normally held once every four years. Now considered as one of the world's foremost sporting events, the Olympic Games is the arena where the best of best athletes from all over the world compete with each other. Quoting the speech of Baron de Coubertin, the father of the modern Olympic games, "the most important thing in the Olympic Games is not to win but to take part, just as the most important thing in life is not the triumph but the struggle. The essential thing is not to have conquered but to have fought well." With the athletes committing themselves to the games, respecting and abiding by the rules, the Olympic Games is undoubtedly a true representation of sportsmanship.

### 1.0.2 The Olympic Games as an indicator of international relations

"No kind of demonstration or political, religious or racial propaganda is permitted in the Olympic areas". So says chapter 5 of the Olympic charter. However, the modern Olympic Games is in itself an exhibition of international relations. Countries assert their political agenda by participating and not participating in the event. Not only the Olympic Games shows the will of individual nations, but also the international crisis that the world faces. It has been cancelled three times in the past century, due to World War. And this year, it is postponed due to the pandemic that swept the whole world. By looking inside the history of the Olympics, you can get a glimpse of the history of international relations.

### 1.0.3 The Olympic Games as a indicator of Power and Dominance

Participating in the Olympic Games may not be a huge deal by itself, but hosting it is not. To become a "candidate city", cities should be big enough to handle a huge number of tourists, athletes, and journalists. They must have enough stadium, hotels, and transportation, and a high level of security. In case of the Winter Olympics, it also requires the proper natural environment and temperature. Even if all the requirements are met, they have to beat other candidate cities in the IOC committee, so it also requires a pretty good global reputation of the city and also the country. For the countries

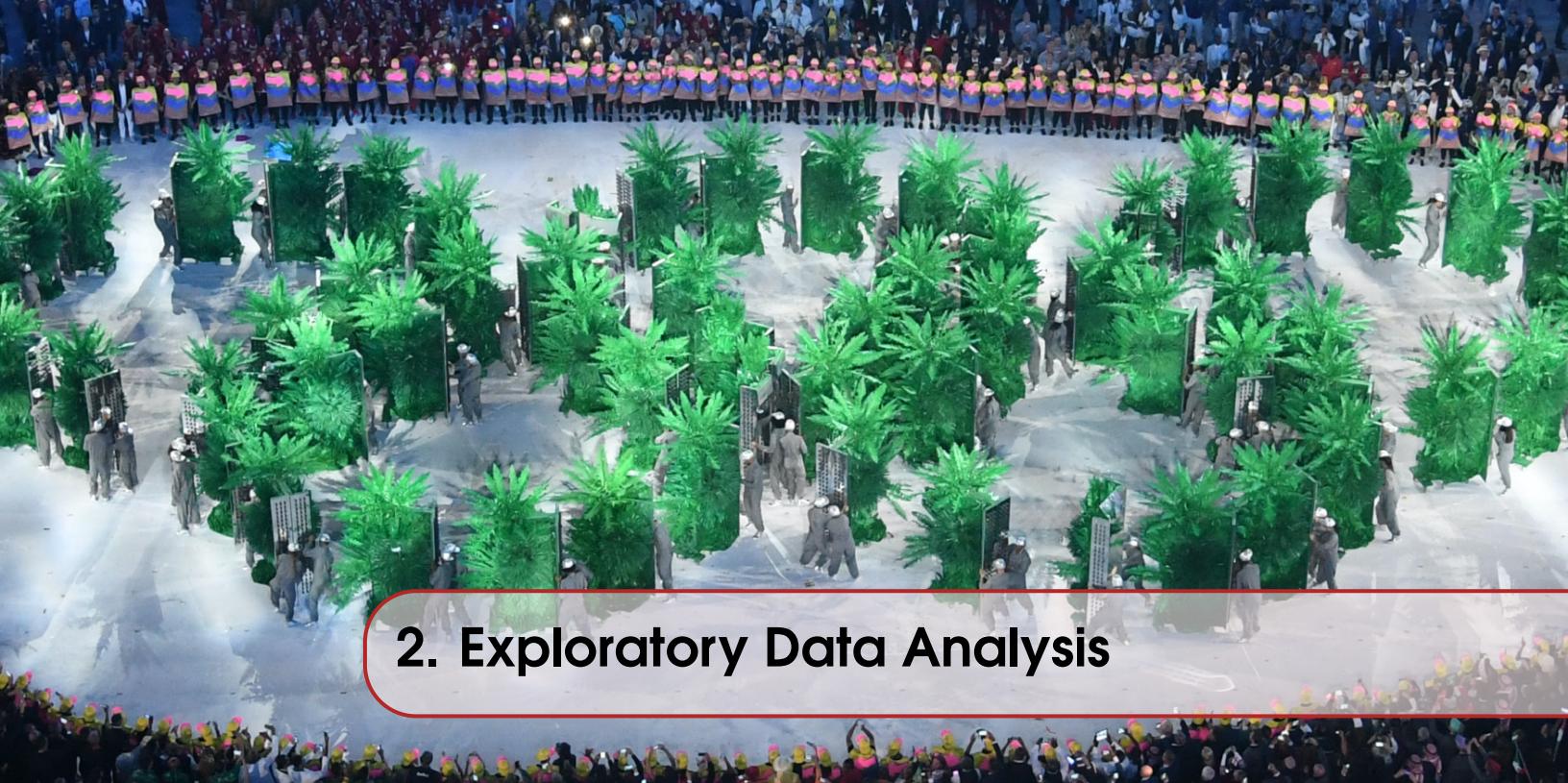
that cannot even dream of being a host country of the Olympic Games, don't worry. You can still show your competence and assert your capability to achieve on the global stage, by being an MVP of certain sports. Other countries will recognize that you have the power to cultivate competent athletes, to win the medals, and to stand on the podium, waving your flag.

In addition to national power and dominance, you can observe other kinds of power and dominance by seeing the Olympic Games. Started as a European (or Western) sport event, all the sports events of the Olympics Games originated from European traditional sports, until 1972, when judo was accepted as an official sport. Similarly, you can see when and how feminine athletes started to become 'allowed' to play in the Olympic Games, to certain disciplines of sports.

All of this, you can see by taking a deeper, wider look into the Olympic games.

## **1.1 Motivation**

Through this visual representation of the evolution of Olympic Games, we aim to naturally invoke readers to think of how global - or not global Olympic games are. From when women participated in Olympic games? From when the countries from specific continents participated in Olympic games? Why was the game cancelled in certain years? Why did certain countries not participate in certain games? By coming up with such questions, users of our website will understand the interconnection between different countries around the world, various disparities around the world, and finally, what it means to be 'international' and 'global', in the year of COVID-19 pandemic and the first case of postponed Summer Olympics.



## 2. Exploratory Data Analysis

### 2.1 Dataset

The dataset used to extract the data needed for our visualization is 120 years of Olympic history: athletes and results. This dataset is extracted from Kaggle and contains data about all the athletes that have taken part in the Olympics (summer and winter) from 1896 to 2016. Therefore, the data from the last 2018 Winter Games held in Pyeongchang (South Korea) is missing.

The data contains over 270k entries where each entry corresponds to an athlete taking part in a sportive event. Details we can extract from the data are Name, Year, NOC (National Olympic Committee), Sport, Event and Medal among others.

Additionally, we are using another small dataset we created ourselves with information about the host cities that have held the Olympics such as their country, continent and geographic coordinates in order to explore them in more detail.

### 2.2 Exploratory Data Analysis

In the first analysis, we divided the exploration in 4 parts taking different points of view: history, sports, countries and athletes. However, as stated in Section 1.1, we decided to focus the visualization of the Olympic Games from a historical perspective and we decided to include the information from sports and countries in the main axis of the visualization, that is the Games through time.

Therefore, we extract the data needed to create our visualization, which included different types of information:

- Location and year where all the Games were held.
- For each game, the participating countries and number of athletes participating for each country.
- For each game, all the sports that were played and some basic statistics about that sport, such as the percentage of athletes and countries competing from the total, the percentage of male vs female athletes participating and the disciplines played in individual vs team. Additionally, a list of the disciplines played in each sport as well as their statistics.



### 3. Design and Implementation

#### 3.1 Design Decisions

##### 3.1.1 Initial Choice of Visualization

From the beginning, our core idea of visualization is to display the evolution of Olympic Games. By having a **timeline**, we showed the history of the Olympic Games in a glance. Also, we aimed to enable users to navigate through time and choose the year and the game they'd like to look deeper. Since there were some years when the Summer Olympics and the Winter Olympics were held in the same year, we made each game clickable, implemented as a lollipop plot, rather than a slide-bar that can be scrolled through the years. On top of the page, we placed a piece of **game info** that contains the basic information of the selected game, such as the year and edition, season, host country and city, and official logo. For each game, we displayed the **World map** where host country and participant countries are marked. Countries were colored differently according to the number of athletes. We intended to naturally engage users to look deeper into the detail, by giving the feeling of seeing a bird's-eye-view. And finally, we displayed all the **sport events** for each game below the map. Readers can click on each sport to see the leading countries (the countries that win most medals) as well as other detailed insights. Combining these altogether, readers can explore the countries that have the most athletes, the game in which a country participated or not participated, the evolution of sport events, and the MVP countries for each sport.

##### 3.1.2 How to deliver the message

One of the important questions we had was: How explicitly do we state our message? How do we direct our readers to our message? From the beginning, we had a clear idea that the evolution of the Olympic Games tells important insights about the world history, international relation, and gender discrimination. These insights are too closely intertwined with each other to be narrated in a single, simple direction. Furthermore, we took the prospective readers of the website into account as well. We are addressing some of the key elements of identity in this project, and we can expect that each reader will have a different perspective and point of interest. In such a case, expressing the message explicitly by guiding the readers to a predefined conclusion might have adverse effects for

some readers. Since we wanted to introduce our insight to as many readers as possible, we decided to deliver messages lightly by enabling users to explore different interactions in the website. We thought that loading lags will hinder the user experiences, so we made the interactions as simple as possible and did not use any animated transitions.

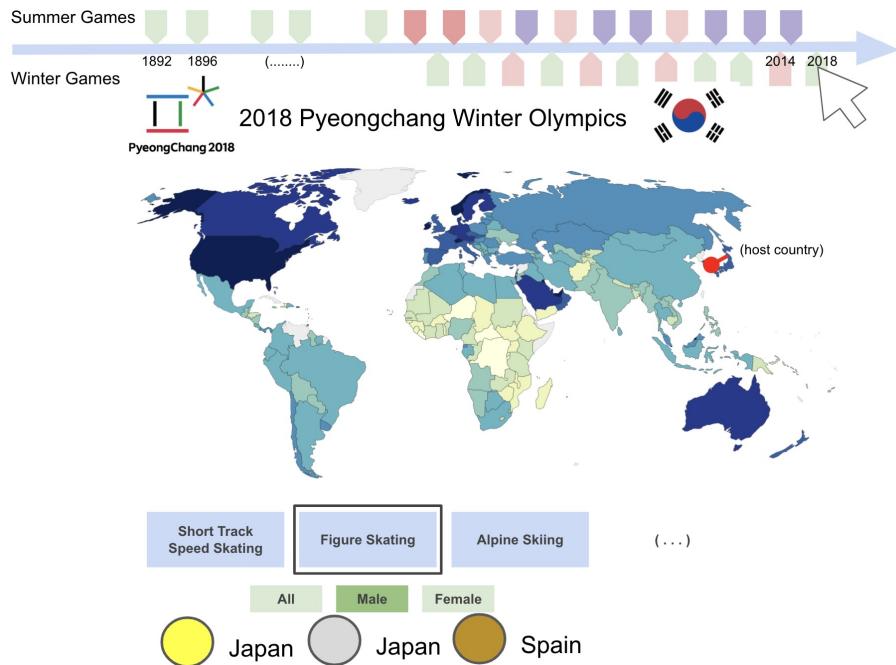


Figure 3.1: Initial layout of the website

## 3.2 Challenges and Changes

There are several challenges and changes we have faced while implementing our design.

In the beginning, the timeline was supposed to be on the top of the page. Since the page was vertically long, the users would have to scroll to the top every time they want to see the stories of different games. We realized that this is a bad user experience, thus we moved the timeline in the right part of the website and put it vertical. Also, it has its own scroll to be able to change the year while exploring the map or the sports section. The evolution of the design can be seen in Figure 3.2.

For the sports part, we originally thought of having the collection of text-boxes of sports names, with the leading countries of each sport shown below. However, this visualization could not represent the different disciplines of each sport. Since the number of disciplines varies greatly between different sports, we decided to display the disciplines of each sport. In addition, we added basic statistics of each discipline to improve the visualization and make the information in this section more complete. Finally, to make the website visually appealing, we put the official pictograms of sports, instead of simple text-boxes. With the pictograms and additional information, we thought it was more practical to have side by side in two different columns. The evolution can be seen in Figure 3.3.

In the end, the final visualization of the website implemented the four visual elements selected in the design process.

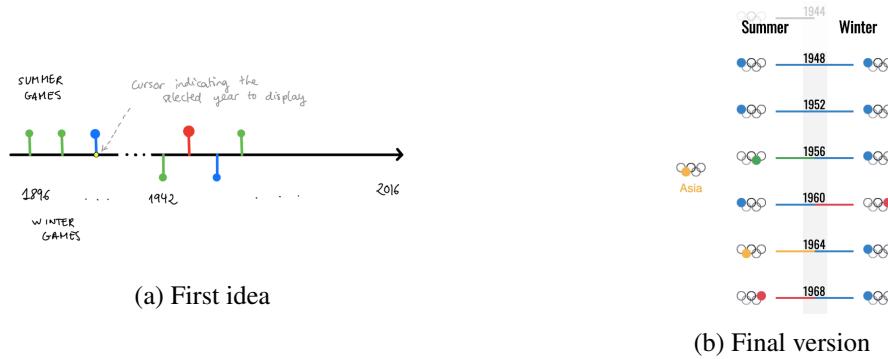


Figure 3.2: Evolution of the timeline design

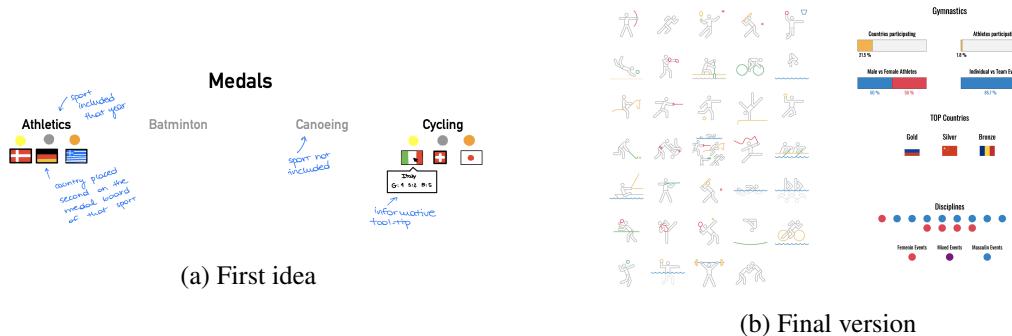


Figure 3.3: Medals design evolution

### 3.3 Final visualization

The final visualization is therefore divided in the different parts we mentioned in Section 3.1 and can be found in the following link. The details of the implementation for each part are described below.

#### 3.3.1 Timeline

The timeline is implemented as a lollipop plot. Each game is placed in the corresponding year and it's located on the right or left based on the season of the game. Each game is represented by the Olympic rings' sign with a ring colored based on the continent location of the host country.

The users can access the information of a game by clicking on the corresponding icon on the timeline. This will trigger the load of information corresponding to that year that will be rendered in the rest of the website. We made the 1896 Athens Olympic a landing page to naturally draw users to a historical journey to the past, see the evolution which led us to where we are now.

#### 3.3.2 Game Info

In addition to the season, edition, and host country and city, the game info section shows how large each event was, by displaying the number of total participant countries and athletes. This section is implemented as an independent SVG that updates information according to the game that is clicked in the timeline. For the interrupted games, we mentioned the international crisis that cancelled or postponed the game.

### 3.3.3 Map

Below the game info, we placed the map. The map is implemented using d3 geopath to render the different countries. Each country is colored based on its number of athletes. We use a blue palette divided into 9 different levels with increasing darkness as the number of participants increases. Moreover, the host city is marked using an image of an Olympic torch colored in red with white borders to make sure it stands out with clear or dark backgrounds.

The information on the number of participants is stored in a csv file and is loaded and stored in an Object whenever a new game is selected. Apart from the color code, the user can read the exact number of athletes coming from a country by placing the cursor on the corresponding country. A tool-tip will pop up with the name of the country and the number of participants and disappear when the cursor is moved out of the country. Finally, there is another tool tip that displays information about the host city when the cursor is placed on the image of the torch.

### 3.3.4 Sports Events

The sports events part is divided into two vertical areas: on the left side, we have the pictograms of the sports played in each game; on the right side, we displayed more details information of the selected sport. Although there is a separation between the spaces, all items are implemented in the same svg in order to avoid unused left-over spaces at the end of the page.

Pictograms are placed from right to left on a grid that adapts to the size of the page. The images are complemented with a tool tip that will display the name of the sport in order to complete the information.

Initially the right space is filled with a text that provides some information to the user on the usage of the pictograms. Once a sport is selected by clicking a pictogram, the text is replaced by different graphics of information about that sport. On the top there are 4 different bars: the top two display information on the size of the event while the two down show information on the genders participating and the individual or collective character of the disciplines included in the event. The bars are build using stacked rectangles that will adapt their sizes according to the data.

Under the bars, information about top performing countries is displayed. From left to right, flags of the countries leading the medal board are displayed. In case of tie, the following place is left empty. When the cursor is placed on a flag, a tool tip shows the name of the country as well as the number of gold, silver and bronze medals that country won on that sport.

Finally, the last part of this section shows the different disciplines involved in each sport. The disciplines are represented by small dots colored based on the gender of the discipline. Under the discipline's dots, there is a legend explaining the meaning of the colors which is complemented by a tool tip that displays the name of the corresponding discipline.

## 3.4 Possible Improvements

Right now, the changes of the borderline in the map is not represented in our visualization. Thus, the Soviet Union from 1976 appears identical to Russia from 2010. Since we knew it requires a heavy data processing step, we only followed the up-to-date world map for this project. With the world map from different times, the visual implication of this website will greatly improve.

Also, we can add bi-directional interaction between the visual elements, so that users can see only the countries that participated in the certain sport on the world map. This will guide the users to even more in-depth questions about the relation of sports and the countries.



## 4. Peer assessment

The process of data exploration, design decisions and implementation have run smoothly and the communication have been fluent.

In terms of design, we started by sharing different ideas and giving our point of view on how each visualization could help to achieve the desired goal in terms of communication. The process have been very integrated with the implementation since once an idea was implemented, it usually lead to a brainstorm of new ideas on how to improve it. This way we have evolved from simpler versions to more complete ones thanks to the exchange of points of view of the team members.

In terms of implementation, we divided the work into the different sections (timeline, header, map, medals) to ease working in parallel. Each person responsible of a section was also responsible to generate the data required for the corresponding visualization. Nevertheless, in terms of implementation, we shared the experience learned from similar work in order to implement new ideas in an easier way. This lead to an involvement of all members in all sections which also help in the task of improving some visualizations.

Therefore, the main contributions to each of the sections of each member is as follows:

- Haeeun: Overall design decisions, implementation of the sports display, and data story.
- Natalia: Data preparation and implementation of header and general statistics of the sports.
- Natalie: Implementation of timeline and map and overall layout.