

# Final-Term Project - International Astronaut Database

MSc Business Analytics 2023/2024

## Data Visualisation



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**The Data Source:** <https://www.kaggle.com/datasets/jessemostipak/astronaut-database/data>

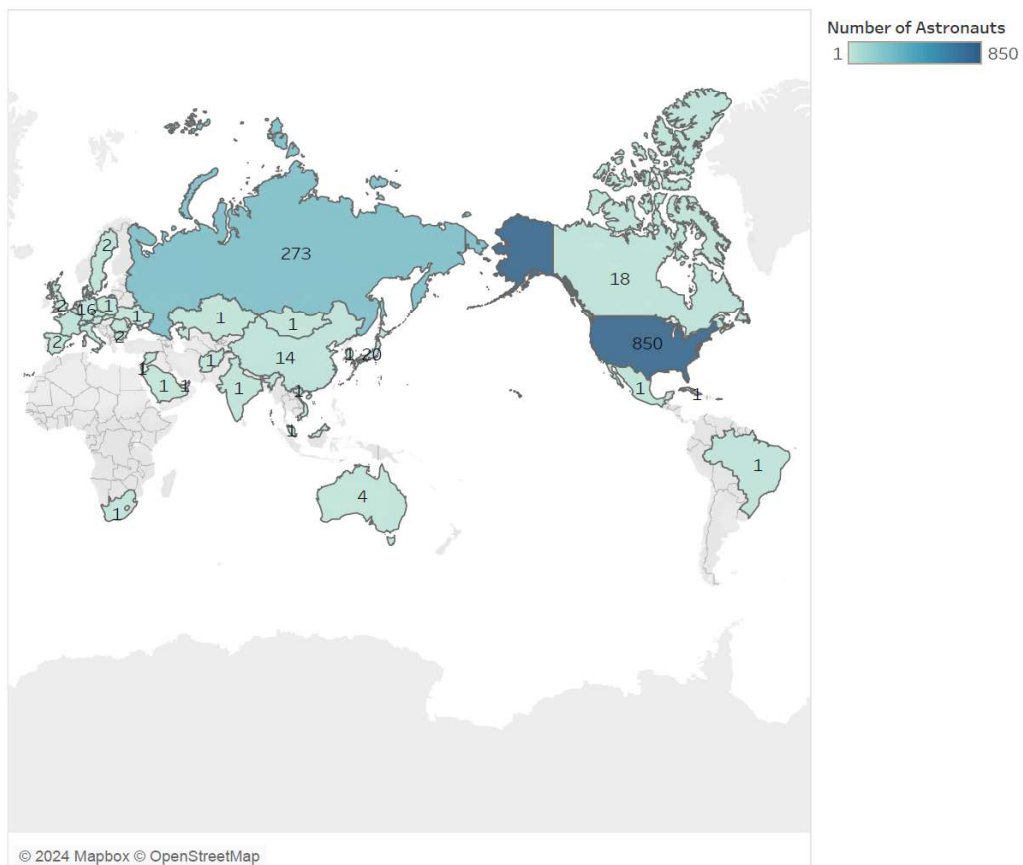
**The Link for the Interactive Charts (Visualisation 1 to 5) :**

<https://public.tableau.com/app/profile/lara.denizoglu5537/viz/InternationalAstronautDatabase/Q1>

## Visualization #1

Q1. Which countries have sent astronauts into space and how many astronauts has each country sent?

A Global View: Number of Astronauts by Country



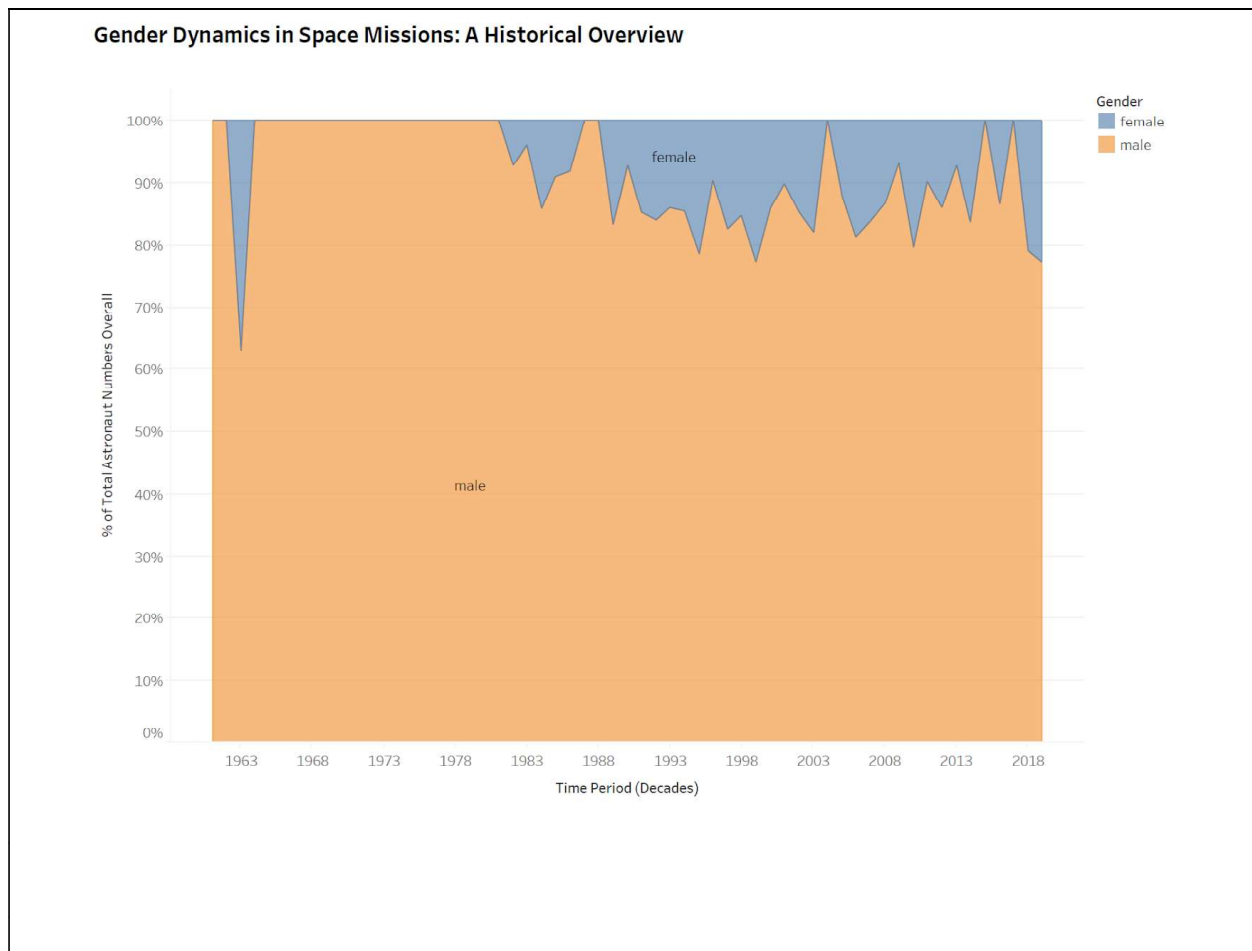
**What is the main insight of the chart? Why do you think this is insightful?**

The chart presented is an insightful interactive map developed in Tableau, which visually compares the number of astronauts each country has contributed to global space missions. Its interactive capabilities allow users to actively engage with the data by highlighting specific countries, offering a tailored analytical experience. Users can filter for a specific country using the highlight section. The map leverages geographical coordinates, with colour intensity indicating the number of astronauts—darker shades represent higher numbers, providing clear visual differentiation and facilitating at-a-glance analysis of global trends in astronaut demographics.

The most striking insight gleaned from this visualization is the clear lead of the United States in terms of astronaut numbers, far surpassing Russia, its closest competitor. Following behind, countries like Japan, Canada, and Germany also make notable contributions, albeit on a smaller scale, illustrating a more diverse international representation in space exploration.

## Visualization #2

Q2. How has the representation of women compared to men in space missions changed over the decades?



**What is the main insight of the chart? Why do you think this is insightful?**

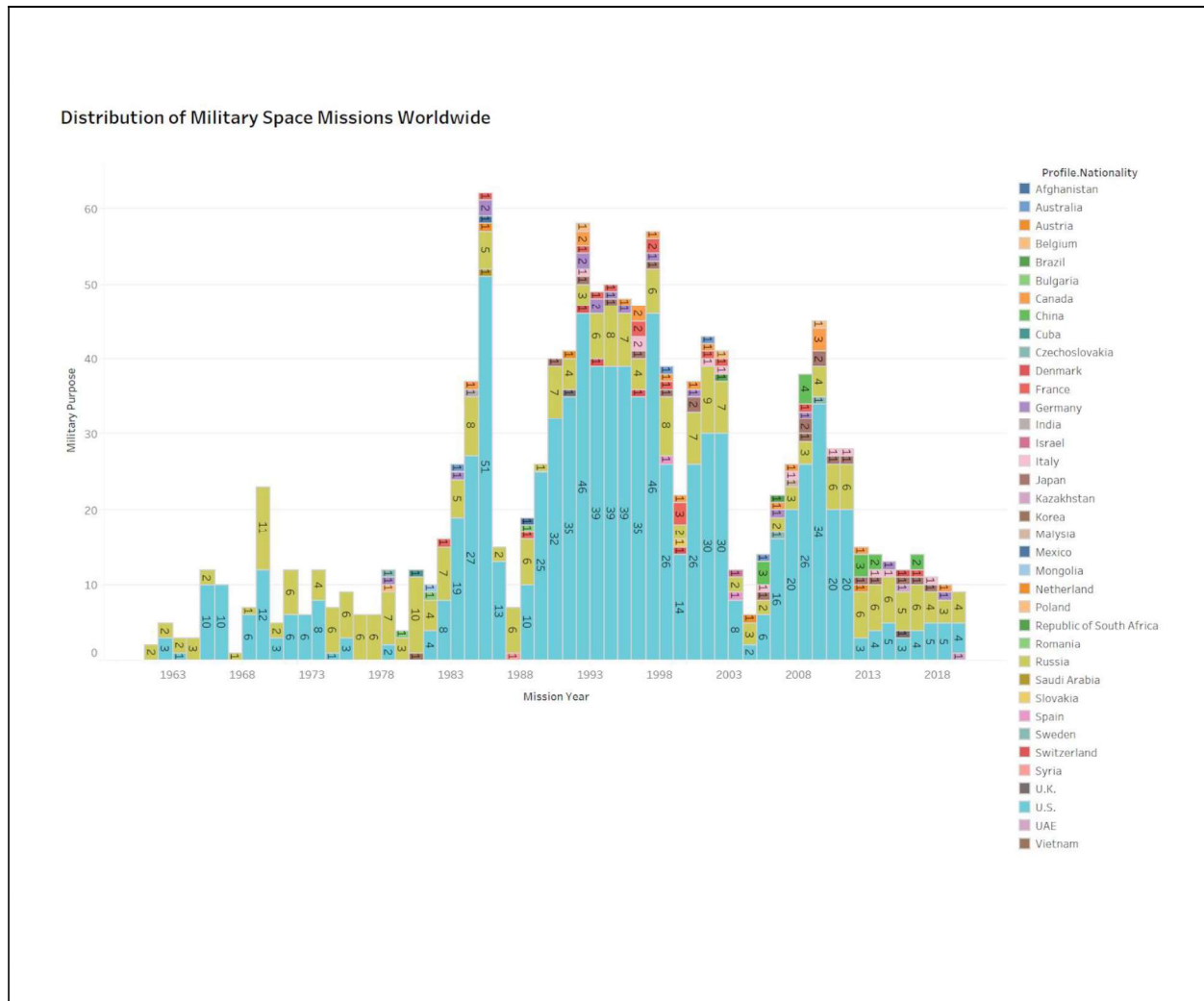
The chart shows the gender distribution among astronauts over the years, highlighting a persistent gender gap with a male-dominated majority. It also shows a slow but progressive trend toward increased gender diversity, despite men still being predominant in the astronaut corps. This pattern mirrors wider societal and institutional shifts toward gender equality in traditionally male-centric professions. The interactivity of the chart adds depth by allowing viewers to explore year-by-year data, offering a more detailed understanding of how gender equality has evolved in this sector.

From the 1960s to the late 1970s, the chart shows virtually no blue area, indicating that space travel was an arena almost exclusively occupied by men. Beginning in the 1980s, we see the emergence and expansion of blue regions, reflecting a growing inclusion of women in astronaut programs. Moving toward the 2010s, the blue area continues to increase, yet the chart clearly demonstrates that, as of 2018, men still constitute a significantly larger proportion of astronauts.

The chart is particularly insightful because it highlights the gender imbalance and indicates periods where female participation has seen increases. The spikes in female representation could correlate with specific programs in space exploration history that encouraged the inclusion of women.

## Visualization #3

Q3. Which countries have historically been active in conducting military space missions, and how has this activity level changed over the decades?



**What is the main insight of the chart? Why do you think this is insightful?**

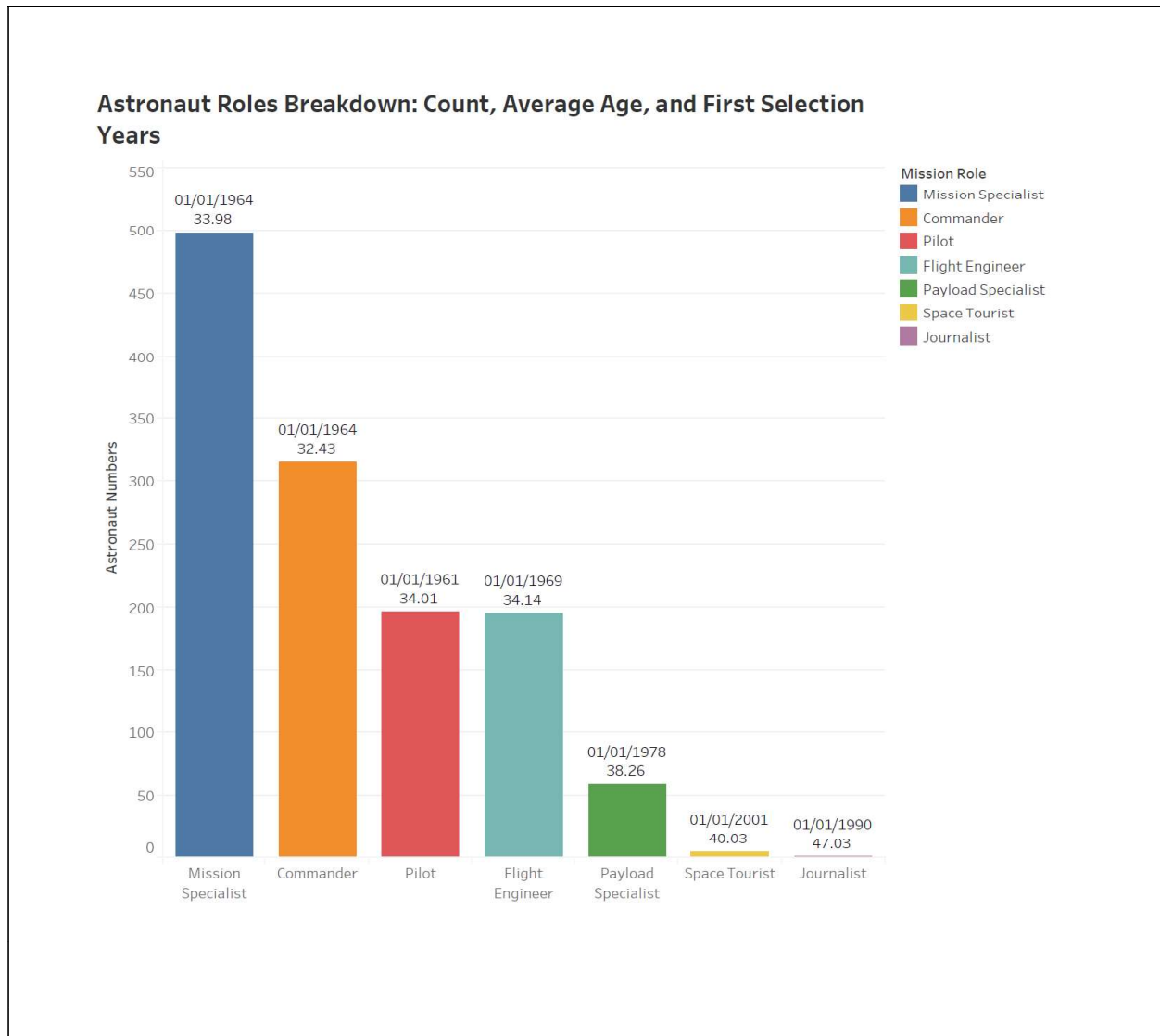
The chart illustrates the historical landscape of military space missions by various countries, highlighting the prevalence of the United States and Russia as the dominant participants. Colour coding efficiently segments nations, making it easier to track their space mission activities over time. This visualization not only identifies leading contributors but also captures global trends and shifts in space-related defence strategies.

Significant activity spikes, particularly during the Cold War, signify periods of heightened space competition between the U.S. and Russia. Notably, the chart reflects a post-1983 decrease in the frequency of U.S. missions, with subsequent fluctuations suggesting changes in policy or focus. Over time, the diversity in coloured bars growing over time suggests an expanding roster of countries engaging in military space missions from 1978, including European nations like the Czech Republic, Poland, and Germany. This trend underscores the increasing global recognition of space's strategic importance.

This chart is insightful because it outlines the intersection of technological capability and geopolitical ambition and charts an evolution from a bilateral race to a multifaceted effort. The distribution of activities underscores the increasing complexity of international security and the expanding role of space as a frontier for national security.

## Visualization #4

Q4. What are the different roles that astronauts have historically taken on, what has been the average age of astronauts in each of those roles, and in what year was each role first occupied?





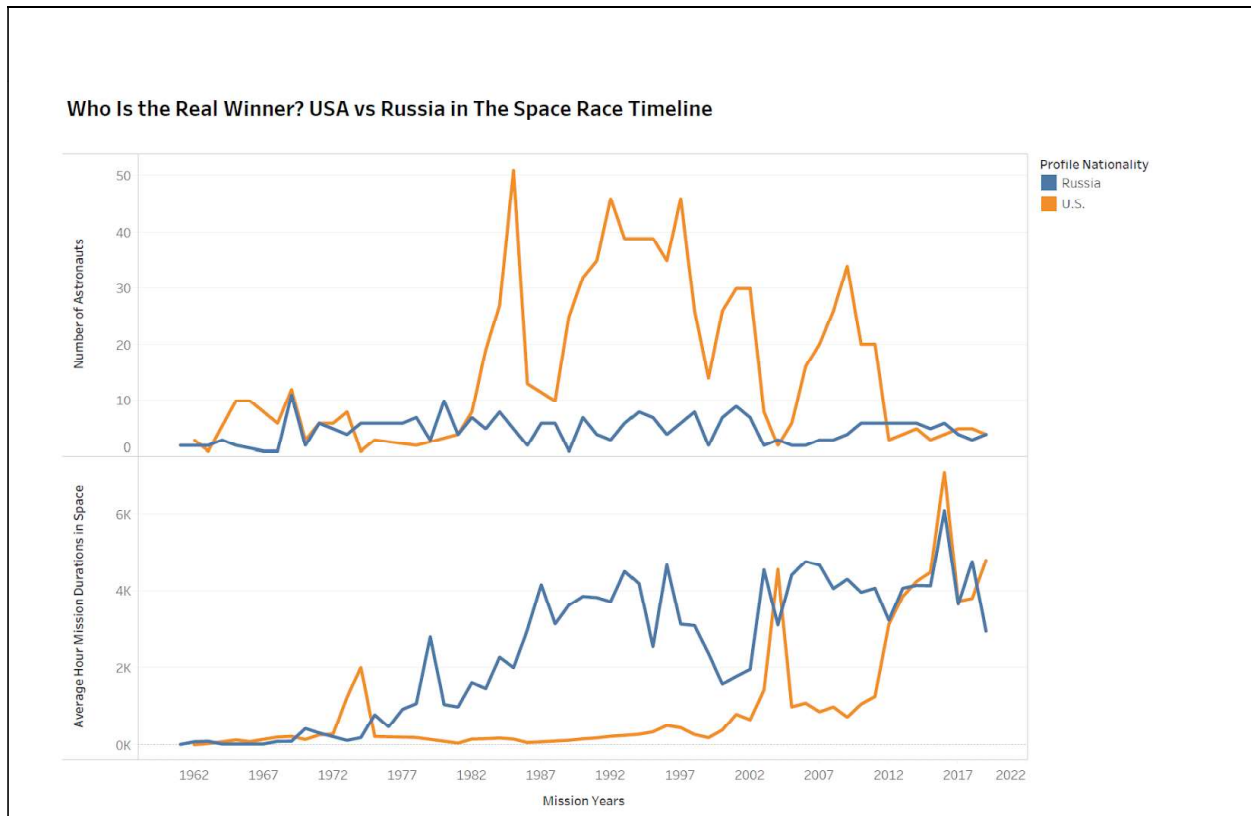
**What is the main insight of the chart? Why do you think this is insightful?**

The main insight from the chart is that it showcases the distribution and demographic profile of astronauts by their assigned mission roles over a historical timeline. It reveals that astronauts have been selected for a variety of roles with the earliest recorded in 1961 for Pilots and the latest in 2001 for Space Tourists. The age at the time of selection also varies ranging from 32 to 47 years, indicating perhaps a preference for certain levels of experience for different roles, with Journalists being the oldest and Commanders the youngest on average at the time of their first selection.

This information is insightful because it can inform us about the changing dynamics and requirements of space missions over time. The trend shows a diversification of roles as space exploration has evolved, incorporating not just pilots and engineers but also specialists, tourists, and even journalists. The data on ages can reflect the levels of experience or physical requirements deemed necessary for different roles. The diversity in years of first selection may indicate the expansion of space programs and the inclusion of more varied mission objectives and participants as space agencies evolved.

## Visualization #5

Q5. Determining the winner of the space race between Russia and the USA has been the subject of intense worldwide popular debate. How do you interpret the results based on your dataset? Which country do you think is the winner?



**What is the main insight of the chart? Why do you think this is insightful?**

The main insight of the chart is the fluctuating leadership between the U.S. and Russia in the space race over time, as seen through the number of astronauts each country sent to space and the average duration of their space missions. Initially, Russia appears to have had more astronauts in space and longer missions, but over time, the U.S. began to close the gap and, in recent years, has often surpassed Russia in mission duration.

This is insightful because it showcases the changing dynamics and priorities in space exploration. While the early race was about getting as many astronauts into space as quickly as possible, the focus has shifted toward the duration of missions, perhaps reflecting a long-term vision for space exploration, including longer-term habitation and more complex missions. The chart also implies that the measure of success in space exploration has evolved from quantity to the quality and depth of space missions, which may offer a more nuanced perspective on who "won" the space race, with the U.S. demonstrating significant advancements in recent years.