

A Problem with Presidents

Mehul Jhaver 9th June 2023

1. Introduction

The dataset with the problem statements contains information about each president, beginning with the first president, George Washington, and ending with the current president, Joe Biden. The information includes the following: birth date, birthplace, death date, and location of death. This report summarizes a few interesting statistics derived from the presidents' birth and death dates if applicable and visualizes certain findings from the analyzed data.

2. Implementation

2.1 Technologies and Libraries

- Python was used for problem-solving and analysis.
- The analysis was conducted in a Jupyter Notebook
- The following libraries were used in this study:
 - **Pandas**: Used for data manipulation and analysis.
 - **NumPy**: Used for numerical computations and array operations.
 - **Matplotlib**: Used for creating basic visualizations.
 - **Seaborn**: Used for creating more advanced and visually appealing plots.

2.2 Assumptions:

- All the calculations have been done with respect to 9th June 2023 as the current date.
- Assuming 30.44 to be the average number of days in a month as average number of days in a year is around 365.25

2.3 Running:

- Requirements.txt file contains all the libraries used for this study. These libraries can be installed by running “*pip install -r requirements.txt*” in the terminal.
- The entire analysis is present in the Solution.ipynb

3. Summary

The following are a few key findings from the analysis:

- Jimmy Carter, who is 98 years old, is the oldest living President.
- George Bush, who lived 94 years, was the oldest deceased President.
- John F. Kennedy, the youngest deceased President, died at the age of 46.
- Barack Obama, the youngest living President, is 61 years old.
- The average observed age in days of all Presidents is 26447.
- The weighted mean age in days of all Presidents is 27235.50
- The median age in days is 26227 and the most common age (mode) is 67 years.

4. Observations

This section discusses the key findings from the analysis of the top ten Presidents from longest to shortest lived, top ten Presidents from shortest to longest lived, a histogram with KDE for years lived, and a frequency distribution of Presidential ages.

4.1 Top 10 Oldest Presidents:

- Jimmy Carter, who is 98 years old, is the oldest President still alive. George H.W. Bush died in 2018 at the age of 94, making him the oldest President to have died.
- The table below was created by selecting the top ten rows of the table after sorting the living days in descending order:

4.2 Top 10 Youngest Presidents:

- Barack Obama, who is 61 years old, is the youngest living President. John F. Kennedy, who died at the age of 46, was the youngest President to die.
- The table below was created by selecting the top ten rows of the table after sorting the living days in ascending order:

Table 1: Top 10 Oldest Presidents

TOP 10 LONGEST LIVED PRESIDENTS					
	PRESIDENT	Age	Months lived	Days lived	Alive
0	Jimmy Carter	98	1184	36045	Yes
1	George Bush	94	1133	34504	No
2	Gerald Ford	93	1121	34133	No
3	Ronald Reagan	93	1119	34088	No
4	John Adams	90	1088	33119	No
5	Herbert Hoover	90	1082	32943	No
6	Harry S. Truman	88	1063	32373	No
7	James Madison	85	1023	31150	No
8	Thomas Jefferson	83	998	30397	No
9	Richard Nixon	81	975	29688	No

Table 2: Top 10 Youngest Presidents

TOP 10 SHORTEST LIVED PRESIDENTS					
	PRESIDENT	Age	Months lived	Days lived	Alive
0	John F. Kennedy	46	557	16978	No
1	James A. Garfield	49	597	18202	No
2	James K. Polk	53	643	19583	No
3	Abraham Lincoln	56	673	20516	No
4	Chester Arthur	57	685	20863	No
5	Warren G. Harding	57	692	21091	No
6	William McKinley	58	703	21412	No
7	Theodore Roosevelt	60	722	21985	No
8	Calvin Coolidge	60	725	22099	No
9	Barack Obama	61	742	22589	Yes

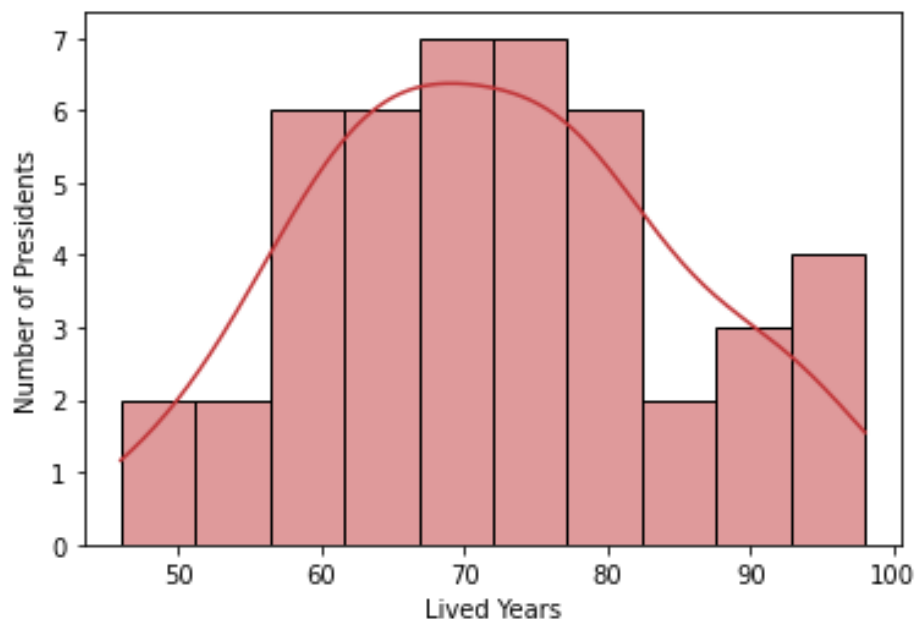
4.3 Statistical Analysis

- The average age (in days) of all presidents observed is 26447. All presidents have a weighted mean age (in days) of 27235.50. All presidents have a median age (in days) of 26227. The most common (mode) age is 16978 (67 years).

STATISTICS FOR LIVED DAYS		
	Statistic	Value
0	Mean	26446.977778
1	Weighted Average	27235.505868
2	Median	26227.000000
3	Mode	16978.000000
4	Max Value	36045.000000
5	Min Value	16978.000000
6	Standard Deviation	4600.958070

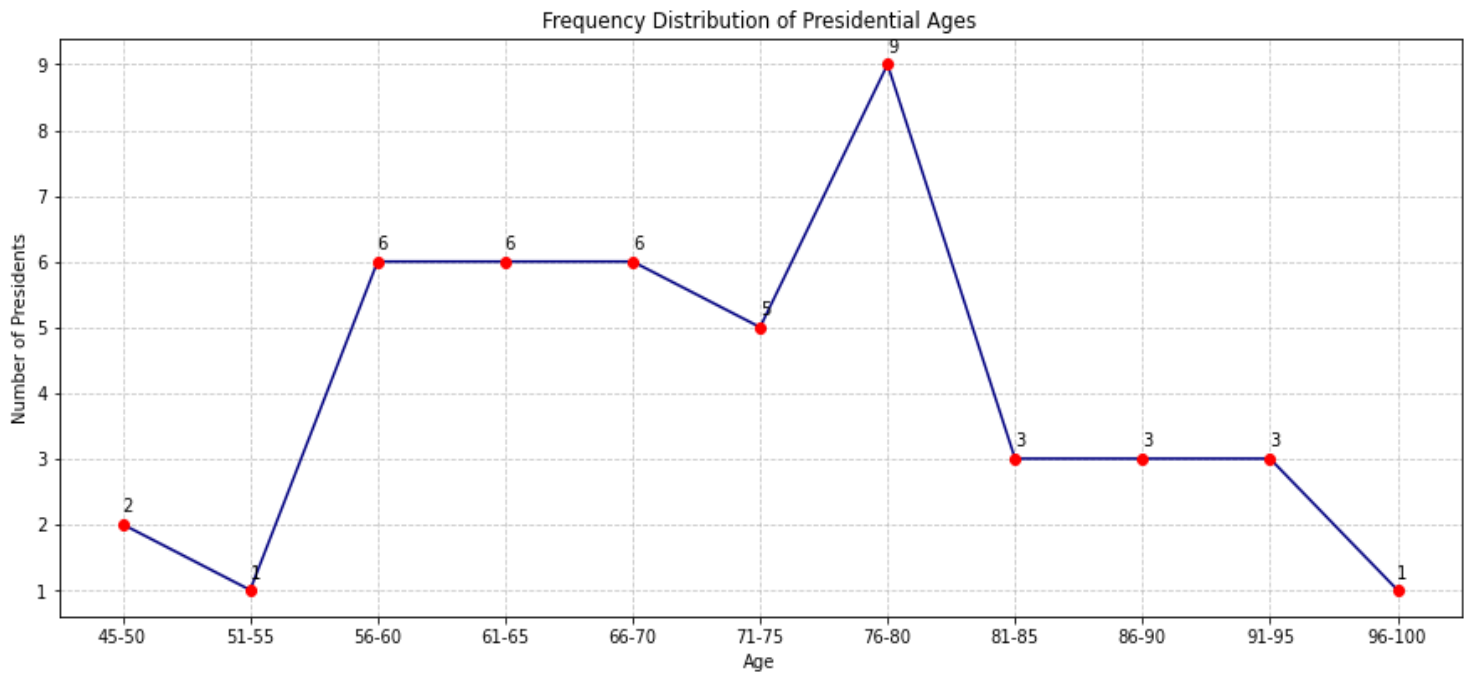
Table 3: Statistics for lived days.

- The below graph shows the distribution of data using a histogram with Kernel Density Estimation (KDE) overlay. It visualizes the distribution of the lived years of U.S. presidents. The KDE overlay is a smoothed curve that represents the estimated probability density function of the distribution. It provides a smooth line that approximates the shape of the distribution. The x-axis represents the range of lived years, divided into 10 bins. The y-axis represents the number of presidents falling within each bin.



Plot 1: Distribution of lived years among U.S. presidents.

- The graph below depicts the frequency distribution of Presidential ages. This is accomplished by binning the ages into bins of size 5, i.e., a range of ages such as 45-50, 50-55...95-100. This basic line graph shows that a maximum of 9 Presidents between the ages of 76 and 80. There is only one President in the age ranges of 51-55 and 96-100.



Plot 2: Frequency distribution of Presidential ages.

5. Conclusion

- Using the analysis of the provided data that was done above, we examine the trends in Presidents' life expectancy.
- The age range is extensive, spanning 46 to 98 years.
- A President's average life expectancy is 72 years.
- The majority of Presidents have lived past the age of 60, and the median age reflects this.

6. Future Scope

A more comprehensive analysis approach can be developed to obtain detailed observational statistics and aid in future decision-making. For instance, examine changes in presidential lifespans over time for patterns or trends. Investigate whether advances in healthcare, societal factors, or other influences have influenced presidential longevity.