

A Problem with President

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This problem deals with statistical analysis of the life expectancy of presidents of the United States. The analysis was done using Python Programming Language. To ease the data processing and analysis Pandas and NumPy libraries have been used.

As per the statistical analysis, the results are as follows:

- The **mean age** was found to be **72.23 years (26364.72 days)**.
- The **weighted mean age** was found to be **72.25 years (26273.84 days)**.
- The **median age** was found to be **71.58 years (26128.50 days)**.
- The **oldest living President** is **Jimmy Carter** who is **98 years old**.
- The **oldest deceased President** is **George Bush** who died at the age of **94 years**.
- The **president with the lowest lifespan** was **John F. Kennedy** who died at the age of **46 years**.
- The **standard deviation** observed in the life expectancy is **12.67 years (4624.54 days)**.

Implementation:

The implementation has been copied into 2 locations namely **naive.py** which provides native python implementation and **notebook.ipynb** which is a jupyter notebook.

Although naive.py has all the implementation required but lacks the features offered by the notebook which allows visualizing the details of the analysis.

The whole .csv dataset was converted into a dataframe (a programmable in-memory table) using Pandas. Using the same library, a new column has been introduced in the given dataset which stored the last known date when the president was alive. It stored the date of death for deceased presidents or the current date for others.

Top 10 Oldest Presidents:

As we can see in the table below which shows the top 10 oldest presidents sorted in descending order of their ages.

- The **oldest living President** is **Jimmy Carter** who is **98 years old**.
- The **oldest deceased President** is **George Bush** who died at the age of **94 years**.

Top 10 Presidents of the United States by age lived, oldest first

PRESIDENT	BIRTH DATE	BIRTH PLACE	DEATH DATE	LOCATION OF DEATH	AGE
Jimmy Carter	Oct 1, 1924	Plains, Georgia	Alive	Alive	98
George Bush	June 12, 1924	Milton, Mass.	Nov 30, 2018	Houston, Texas	94
Gerald Ford	July 14, 1913	Omaha, Nebraska	Dec 26, 2006	Rancho Mirage, Cal.	93
Ronald Reagan	Feb 6, 1911	Tampico, Illinois	June 5, 2004	Los Angeles, Cal.	93
John Adams	Oct 30, 1735	Quincy, Mass.	July 4, 1826	Quincy, Mass.	90
Herbert Hoover	Aug 10, 1874	West Branch, Iowa	Oct 20, 1964	New York, New York	90
Harry S. Truman	May 8, 1884	Lamar, Missouri	Dec 26, 1972	Kansas City, Missouri	88
James Madison	Mar 16, 1751	Port Conway, Va.	June 28, 1836	Orange Co., Va.	85
Thomas Jefferson	Apr 13, 1743	Albemarle Co., Va.	July 4, 1826	Albemarle Co., Va.	83
Richard Nixon	Jan 9, 1913	Yorba Linda, Cal.	Apr 22, 1994	New York, New York	81

Top 10 Youngest Presidents:

As we can see in the table below which shows the top 10 youngest presidents sorted in ascending order of their ages.

- The **president with the lowest lifespan** was **John F. Kennedy** who died at the age of **46 years**.
- The **youngest living President** is **Jimmy Carter** who is **61 years old**.

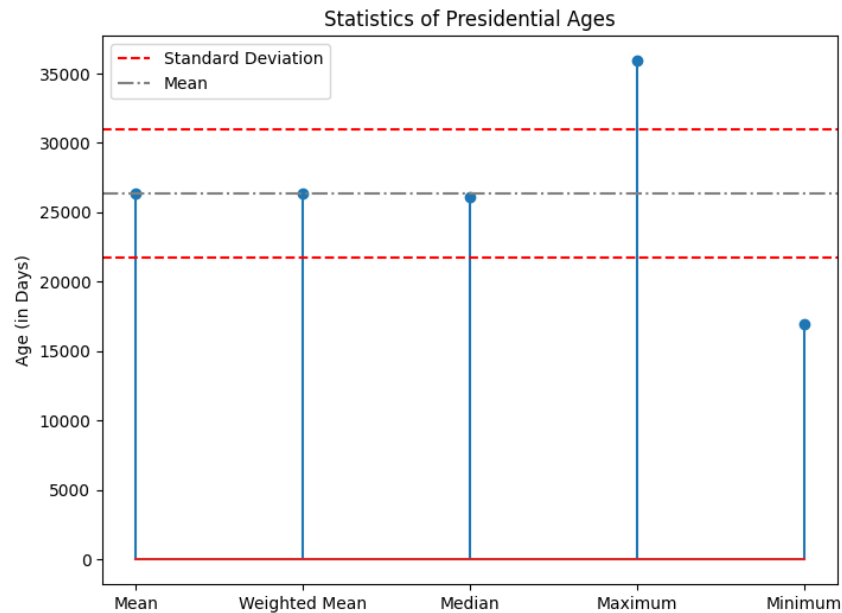
Top 10 Presidents of the United States by age lived, youngest first

PRESIDENT	BIRTH DATE	BIRTH PLACE	DEATH DATE	LOCATION OF DEATH	AGE
John F. Kennedy	May 29, 1917	Brookline, Mass.	Nov 22, 1963	Dallas, Texas	46
James A. Garfield	Nov 19, 1831	Cuyahoga Co., Ohio	Sep 19, 1881	Elberon, New Jersey	49
James K. Polk	Nov 2, 1795	Mecklenburg Co., N.C.	June 15, 1849	Nashville, Tennessee	53
Abraham Lincoln	Feb 12, 1809	LaRue Co., Kentucky	Apr 15, 1865	Washington, D.C.	56
Chester Arthur	Oct 5, 1829	Fairfield, Vermont	Nov 18, 1886	New York, New York	57
Warren G. Harding	Nov 2, 1865	Morrow County, Ohio	Aug 2, 1923	San Francisco, Cal.	57
William McKinley	Jan 29, 1843	Niles, Ohio	Sep 14, 1901	Buffalo, New York	58
Theodore Roosevelt	Oct 27, 1858	New York, New York	Jan 6, 1919	Oyster Bay, New York	60
Calvin Coolidge	July 4, 1872	Plymouth, Vermont	Jan 5, 1933	Northampton, Mass.	60
Barack Obama	Aug 4, 1961	Honolulu, Hawaii	Alive	Alive	61

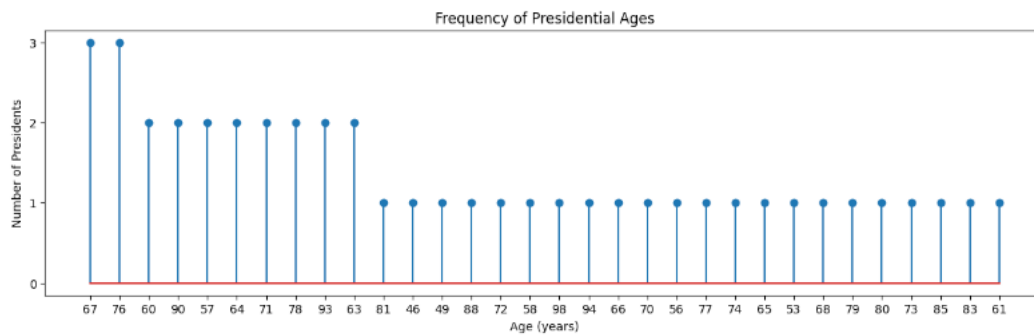
Statistics:

Statistic	Age (Days)	Age (Years)
Mean	26364.727273	72.232130
Weighted Mean	26373.847222	72.257116
Median	26128.500000	71.584932
Mode	[24455, 27740]	[67.0, 76.0]
Maximum	35916.000000	98.400000
Minimum	16978.000000	46.515068
Standard Deviation	4624.545797	12.669988

- The **mean age** was found to be **72.23 years (26364.72 days)**.
- The **weighted mean age** was found to be **72.25 years (26273.84 days)**.
- The **median age** was found to be **71.58 years (26128.50 days)**.
- The maximum age is **98.40 years (35916 days)**.
- The minimum age is **46.15 years (16978 days)**.
- The **standard deviation** observed in the life expectancy is **12.67 years (4624.54 days)**.



- The most frequent ages were found to be **67, and 76 years**, counting for 3 presidents for each age.



Conclusion:

As we examine the trends in the life expectancy of Presidents using the analysis of the provided data that was done above. The age range is wide, between 46 to 98 to be exact. The average life expectancy of a president is 72 years old, which is close to the current life expectancy for men in the United States, which was 75.1 years in 2020. Most Presidents have lived above the age of 60, and the median age closely reflects this tendency.

The assassination of four of the top eight youngest Presidents, which is an unnatural death, has a substantial impact on the metrics computed. When contrasted to the total data, John F. Kennedy, for instance, stands out as a noteworthy oddity because he was assassinated when healthcare was still advancing rapidly, and life expectancy was rising considerably, especially for those who had access to it. If the sad incident had never happened, perhaps these Presidents would have lived longer.

Reference:

1. Provisional Life Expectancy Estimates for January through June 2020 - CDC, NVSS, NCSS.