

# Problem with presidents - Report

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## Introduction:

The data provides details about all the presidents the United States of America till date with their date of birth, place of birth, date of death, place of death (for presidents currently living, the values are NaN). The task was to introduce extra columns which are derived from the existing ones and visualize various statistical measures from the newly created data.

## The Code:

All the code blocks are present in the “Solution\_Kshitij\_Sinha.ipynb”. Jupyter notebook is used as it provides block wise execution of code and dataframe visualizations which traditional “.py” files cannot.

## The Approach:

Firstly, I filled all the NaN values for “DEATH DATE” with current datetime to calculate the current age of the presidents alive and “LOCATION OF DATE” with “Alive” to eliminate the possibilities of miscalculations and to eliminate inconsistencies. I stored the current datetime in “currDate” variable to replace it after all the calculations are done to avoid any incorrect permanent changes to the data. The format of dates provided is modified so to extract the year, month and date easily. After calculating “lived\_years”, “lived\_months”, “lived\_days” and the “age”, the data is sorted with respect to “lived\_days” both in an increasing and decreasing order and stored into two different data frames with top 10 rows.

## Top 10 Longest Lived Presidents:

According to the analysis, Jimmy Carter is the oldest living president with age 98 years and George Bush is the oldest deceased president and lived for 94 years. The complete table is shown below:

	PRESIDENT	BIRTH DATE	BIRTH PLACE	DEATH DATE	LOCATION OF DEATH	year_of_birth	lived_years	lived_months	lived_days	age
37	Jimmy Carter	1924-10-01	Plains, Georgia	NaT	Alive	1924	98.071829	1176.861948	35820.0	98
39	George Bush	1924-06-12	Milton, Mass.	2018-11-30	Houston, Texas	1924	94.468743	1133.624920	34504.0	94
36	Gerald Ford	1913-07-14	Omaha, Nebraska	2006-12-26	Rancho Mirage, Cal.	1913	93.452980	1121.435758	34133.0	93
38	Ronald Reagan	1911-02-06	Tampico, Illinois	2004-06-05	Los Angeles, Cal.	1911	93.329774	1119.957289	34088.0	93
1	John Adams	1735-10-30	Quincy, Mass.	1826-07-04	Quincy, Mass.	1735	90.676742	1088.120906	33119.0	90
29	Herbert Hoover	1874-08-10	West Branch, Iowa	1964-10-20	New York, New York	1874	90.194871	1082.338446	32943.0	90
31	Harry S. Truman	1884-05-08	Lamar, Missouri	1972-12-26	Kansas City, Missouri	1884	88.634264	1063.611162	32373.0	88
3	James Madison	1751-03-16	Port Conway, Va.	1836-06-28	Orange Co., Va.	1751	85.285803	1023.429639	31150.0	85
2	Thomas Jefferson	1743-04-13	Albemarle Co., Va.	1826-07-04	Albemarle Co., Va.	1743	83.224159	998.689911	30397.0	83
35	Richard Nixon	1913-01-09	Yorba Linda, Cal.	1994-04-22	New York, New York	1913	81.282983	975.395799	29688.0	81

## Top 10 Shortest Lived Presidents:

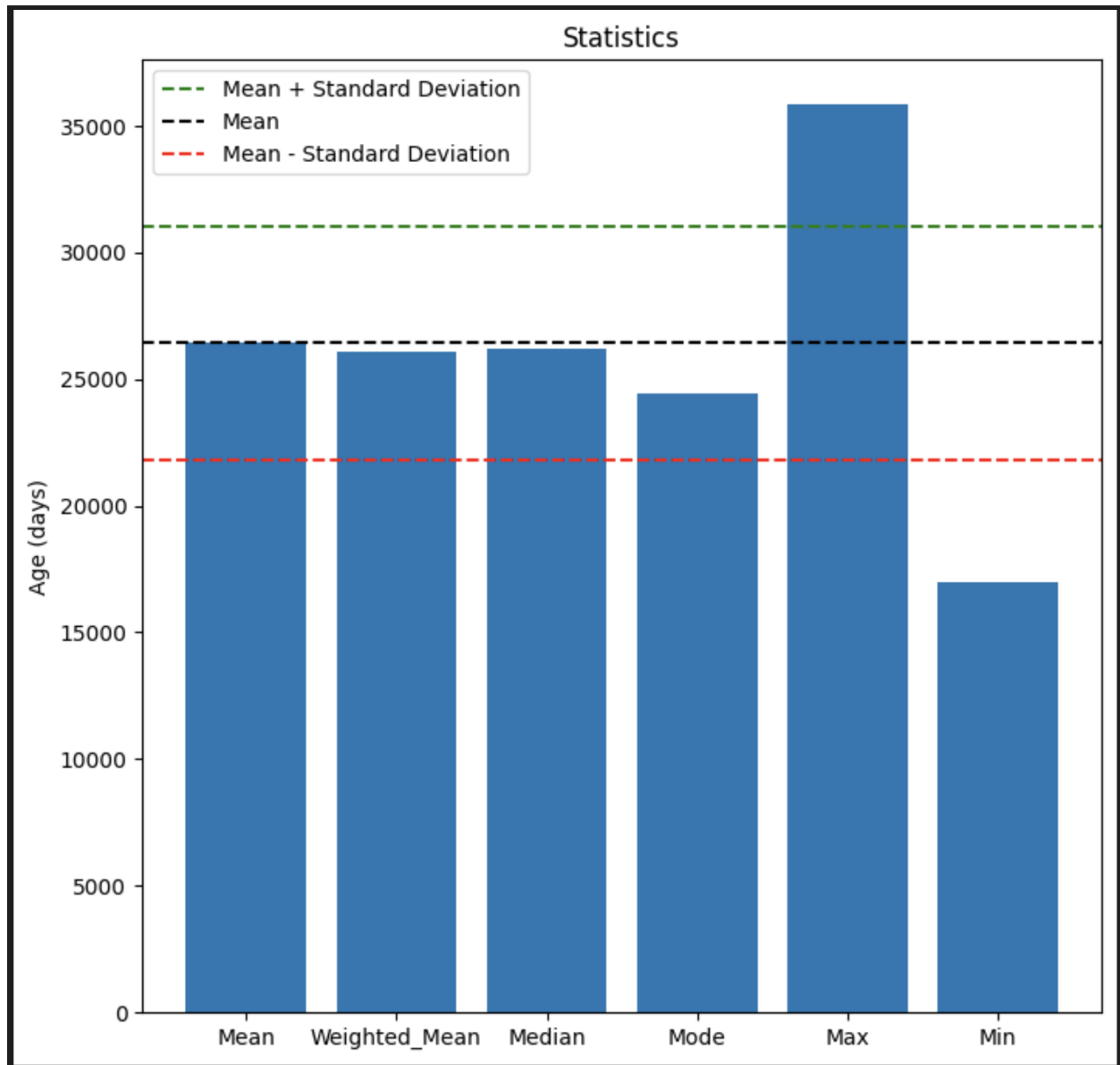
According to the analysis, John F. Kennedy is the shortest living president with age 46 years and the complete table is shown below:

	PRESIDENT	BIRTH DATE	BIRTH PLACE	DEATH DATE	LOCATION OF DEATH	year_of_birth	lived_years	lived_months	lived_days	age
33	John F. Kennedy	1917-05-29	Brookline, Mass.	1963-11-22	Dallas, Texas	1917	46.484185	557.810222	16978.0	46
19	James A. Garfield	1831-11-19	Cuyahoga Co., Ohio	1881-09-19	Elberon, New Jersey	1831	49.835383	598.024600	18202.0	49
10	James K. Polk	1795-11-02	Mecklenburg Co., N.C.	1849-06-15	Nashville, Tennessee	1795	53.616433	643.397195	19583.0	53
15	Abraham Lincoln	1809-02-12	LaRue Co., Kentucky	1865-04-15	Washington, D.C.	1809	56.170900	674.050802	20516.0	56
20	Chester Arthur	1829-10-05	Fairfield, Vermont	1886-11-18	New York, New York	1829	57.120954	685.451447	20863.0	57
27	Warren G. Harding	1865-11-02	Morrow County, Ohio	1923-08-02	San Francisco, Cal.	1865	57.745197	692.942360	21091.0	57
23	William McKinley	1843-01-29	Niles, Ohio	1901-09-14	Buffalo, New York	1843	58.624065	703.488778	21412.0	58
24	Theodore Roosevelt	1858-10-27	New York, New York	1919-01-06	Oyster Bay, New York	1858	60.192886	722.314627	21985.0	60
28	Calvin Coolidge	1872-07-04	Plymouth, Vermont	1933-01-05	Northampton, Mass.	1872	60.505007	726.060083	22099.0	60
42	Barack Obama	1961-08-04	Honolulu, Hawaii	NaT	Alive	1961	61.230552	734.766628	22364.0	61

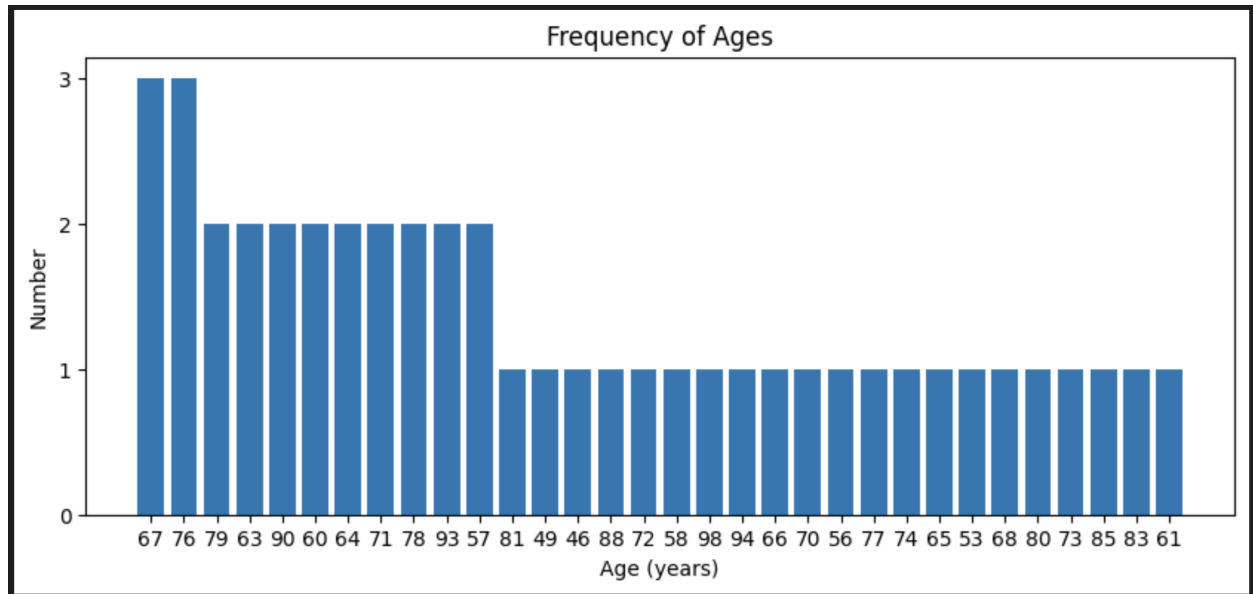
## Statistical measures:

All the statistics are calculated using the built-in functions provided by pandas. For the weighted mean, I randomly assigned weights between 0 and 1 since there was no way to assign a particular weight to a particular value. Due to this, every time the weighted mean is calculated, there is a slight variation in the value depending on how the the weight is assigned at that execution.

	Age Statistic	in Days	in Years
0	Mean	26416.977778	72.375282
1	Weighted_Mean	26106.329685	71.524191
2	Median	26227.000000	71.854795
3	Mode	24455.000000	67.000000
4	Max	35820.000000	98.136986
5	Min	16978.000000	46.515068
6	Standard_Deviation	4586.423039	12.565543



As shown, the **Mean** is 72.37, **Weighted mean** is 71.52, **Median** is 71.85, **Max** value 98.13, **Min** value 46.51, **Standard deviation** is 12.56. For the **mode**, two values were returned 67, 76 of which I picked the first value. The frequency plot shows the two mode values:



## Conclusion:

By the analysis, we see the trend as how long the presidents have lived. The average age of 72 years shows that the presidents have a comparatively less life expectancy to a normal male in the US who live for about 80 years on average but this is also impacted by the unfortunate assassinations for some of the presidents at a young age. The median shows that most of the presidents have a life expectancy of more than 60 years.