

# **A problem with Presidents - Report**

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07/13/2023

## **Introduction:**

The dataset provided contains details about all the presidents of the United States of America till date with their date of birth, place of birth, death date and place of death (For those who are currently alive the values are NaN). The task was to add new columns derived from the given data and visualize various statistical measures from the new data formed.

The code solution is present in the file named "Amisha\_Singhal.ipynb". Google colaboratory is used for implementation of this code.

## **The Approach:**

- Before proceeding with the task I made a copy of the dataset to retain the original one for further reference if needed.
- Now it is observed that some of the fields in the death date and place are missing as those presidents are still alive. So replacing all the NaN values in death date by the present date and death place by 'Alive'.
- Added the required extra columns and calculated the number of years, months and days a president has lived. Now using the number of days finding the top 10 longest to shortest lived presidents and vice versa.

### Shortest to Longest Lived Presidents:

According to the analysis, John F Kennedy was the shortest lived president with his death at the age of 46 only.

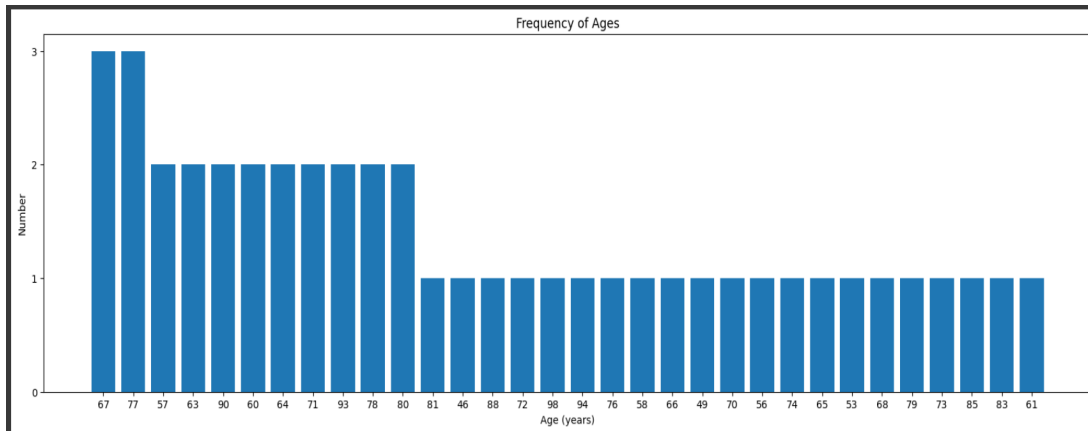
	PRESIDENT	BIRTH DATE	BIRTH PLACE	DEATH DATE	LOCATION OF DEATH	year_of_birth	lived_years	lived_months	lived_days
33	John F. Kennedy	1917-05-29	Brookline, Mass.	1963-11-22	Dallas, Texas	1917.0	46.484185	557.810222	16978.0
19	James A. Garfield	1831-11-19	Cuyahoga Co., Ohio	1881-09-19	Elberon, New Jersey	1831.0	49.835383	598.024600	18202.0
10	James K. Polk	1795-11-02	Mecklenburg Co., N.C.	1849-06-15	Nashville, Tennessee	1795.0	53.616433	643.397195	19583.0
15	Abraham Lincoln	1809-02-12	LaRue Co., Kentucky	1865-04-15	Washington, D.C.	1809.0	56.170900	674.050802	20516.0
20	Chester Arthur	1829-10-05	Fairfield, Vermont	1886-11-18	New York, New York	1829.0	57.120954	685.451447	20863.0
27	Warren G. Harding	1865-11-02	Morrow County, Ohio	1923-08-02	San Francisco, Cal.	1865.0	57.745197	692.942360	21091.0
23	William McKinley	1843-01-29	Niles, Ohio	1901-09-14	Buffalo, New York	1843.0	58.624065	703.488778	21412.0
24	Theodore Roosevelt	1858-10-27	New York, New York	1919-01-06	Oyster Bay, New York	1858.0	60.192886	722.314627	21985.0
28	Calvin Coolidge	1872-07-04	Plymouth, Vermont	1933-01-05	Northampton, Mass.	1872.0	60.505007	726.060083	22099.0
42	Barack Obama	1961-08-04	Honolulu, Hawaii	2023-07-12	Alive	1961.0	61.936932	743.243188	22622.0

### Longest to Shortest lived Presidents:

According to the analysis Jimmy Carter is the longest living president with his current age being 98. And George Bush is the longest lived president after Jimmy Carter with his death at the age of 94 years.

	PRESIDENT	BIRTH DATE	BIRTH PLACE	DEATH DATE	LOCATION OF DEATH	year_of_birth	lived_years	lived_months	lived_days
37	Jimmy Carter	1924-10-01	Plains, Georgia	2023-07-12	Alive	1924.0	98.778209	1185.338508	36078.0
39	George Bush	1924-06-12	Milton, Mass.	2018-11-30	Houston, Texas	1924.0	94.468743	1133.624920	34504.0
36	Gerald Ford	1913-07-14	Omaha, Nebraska	2006-12-26	Rancho Mirage, Cal.	1913.0	93.452980	1121.435758	34133.0
38	Ronald Reagan	1911-02-06	Tampico, Illinois	2004-06-05	Los Angeles, Cal.	1911.0	93.329774	1119.957289	34088.0
1	John Adams	1735-10-30	Quincy, Mass.	1826-07-04	Quincy, Mass.	1735.0	90.676742	1088.120906	33119.0
29	Herbert Hoover	1874-08-10	West Branch, Iowa	1964-10-20	New York, New York	1874.0	90.194871	1082.338446	32943.0
31	Harry S. Truman	1884-05-08	Lamar, Missouri	1972-12-26	Kansas City, Missouri	1884.0	88.634264	1063.611162	32373.0
3	James Madison	1751-03-16	Port Conway, Va.	1836-06-28	Orange Co., Va.	1751.0	85.285803	1023.429639	31150.0
2	Thomas Jefferson	1743-04-13	Albemarle Co., Va.	1826-07-04	Albemarle Co., Va.	1743.0	83.224159	998.689911	30397.0
35	Richard Nixon	1913-01-09	Yorba Linda, Cal.	1994-04-22	New York, New York	1913.0	81.282983	975.395799	29688.0

- Calculated the frequency of the ages to get the what number of presidents belong to which age group as shown in the graph below:

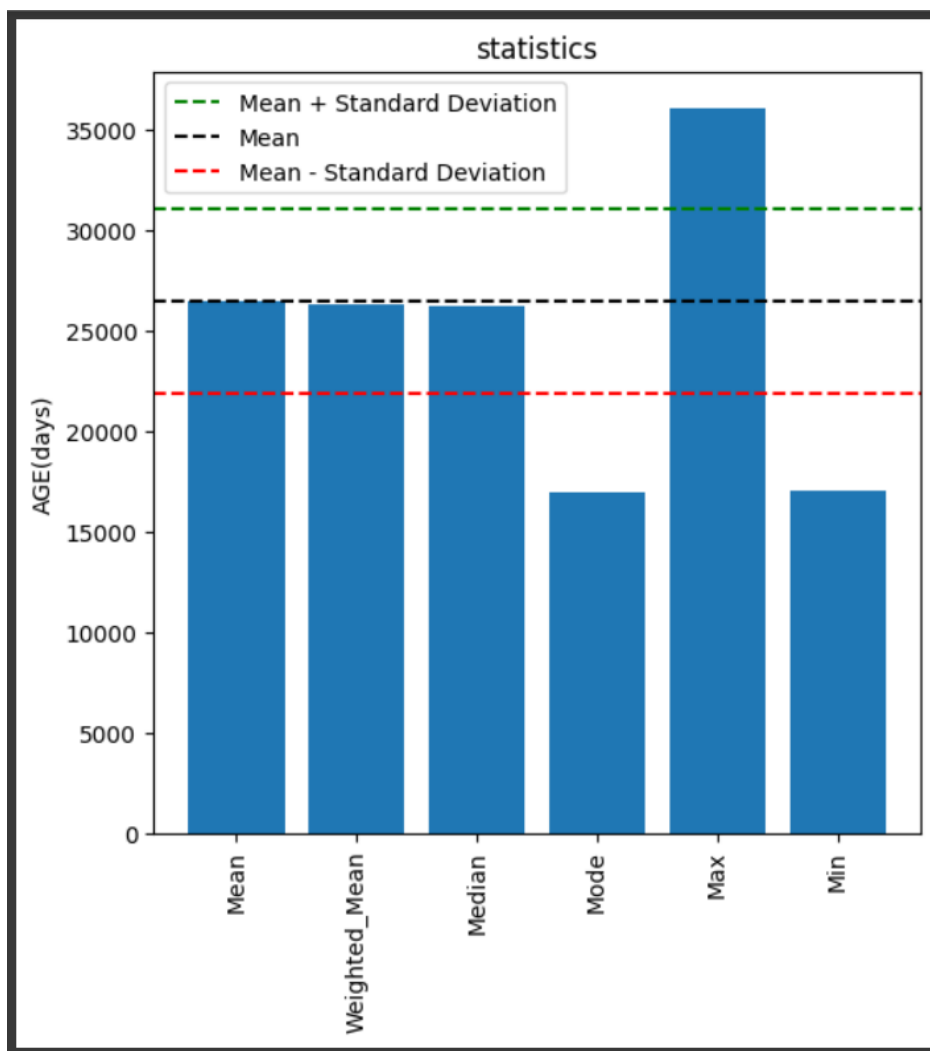


- Calculated the statistical measures of the new data such as Mean, Median, Weighted mean, Mode, Max, Min and the standard deviation. For the weighted mean, I have assigned the weights according to the frequency of the age. Highest frequency age has been assigned the weight of 1.0 then 0.5 and 0.25 for the lower frequencies.

This calculated data has been visualized in a table as follows:

	Age Statistic	in Days	in Years
0	Mean	26451.377778	72.469528
1	Weighted_Mean	26272.234043	71.978723
2	Median	26227.000000	71.854795
3	Mode	16966.727585	46.484185
4	Max	36078.000000	98.843836
5	Min	16978.000000	46.515068
6	Standard_Deviation	4603.195310	12.611494

- The above calculated statistical data has been plotted in a bar graph as shown below, where the green dashed line represents the mean with the standard deviation and red line representing the mean without the standard deviation. The black line represents the original mean.



## **Conclusion:**

By the Analysis of this data we can conclude that the average age up to which a president has lived is 72 years which is a little less than the average life expectancy of a normal male in the US of 77 years. It is also seen that some of the presidents could not make it up to the average and died at a relatively early age, for example John F Kennedy. It is worth exploring the potential reasons behind this disparity, such as the high-stress nature of the presidency, the demands of leadership, and the impact of the decisions and responsibilities that come with the role. Further analysis and research can shed more light on these factors and their influence on the lifespan of U.S. presidents.