

A Problem with Presidents

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Abstract

The CSV file 'U.S. Presidents Birth and Death Information - Sheet1' includes the presidents' names, birth dates, death dates, and the locations of their births and deaths. Using statistical methods to analyze the dataset it is determined that the average lived days is 26,371.64 and the median is 26,227 days. John F. Kennedy is the shortest-lived president at 16,978 days (minimum), the longest-lived president is Jimmy Carter at 35,480 days (maximum) and counting.

Procedure

To analyze the data, it is imported from the original CSV file, loaded, and transformed, via Python/PostgreSQL.

Table: President List with Additional Columns

The data is imported as strings into a source table then transformed into specific datatypes to help calculate the presidents' life span.

- id: auto-incremented, integer
- name: name of the president, varchar
- birth_date: time of birth, date
- birth_place: location of birth, varchar
- death_date: time of death, date
- death_location: location of death, varchar
- birth_year: year of birth, date
- lived_years: number of years lived calculated as (death_date - birth_date), if a president is alive the calculation is (current_date - birth_date)
- lived_months: number of months lived calculated as (death_date - birth_date), if a president is alive the calculation is (current_date - birth_date)
- lived_days: number of days lived calculated as (death_date - birth_date), if a president is alive the calculation is (current_date - birth_date)
- alive: president is alive, bool

Table: President Statistics

From the table 'President List with Additional Columns', the following statistical functions are implemented on the dataset and transferred into a new table.

- Mean: average value in a data set

X_i : number of days lived

n : number of presidents

$$\bar{X} = \frac{\sum_{i=1}^{i=n} X_i}{n}$$

- Weighted Mean:

w_i : weight according to number of days lived, based on the total number of unique presidents

x_i : number of days lived

$$X_{wav} = \frac{\sum w_i x_i}{\sum w_i}$$

- Median: central value in a data set
- Mode: value that occurs most frequently in a data set
- Minimum (min): smallest value in a data set
- Maximum (max): largest value in a data set
- Standard Deviation:

X_i : number of days lived

n : number of presidents

\bar{X} : average of the number of days lived

$$\sigma = \sqrt{\frac{1}{n-1} \sum_{i=1}^{i=n} (X_i - \bar{X})^2}$$

References

[https://eng.libretexts.org/Bookshelves/Industrial_and_Systems_Engineering/Book%3A_Chemical_Process_Dynamics_and_Controls_\(Woolf\)/13%3A_Statistics_and_Probability_Background/13.01%3A_Basic_statistics-mean%2C_median%2C_average%2C_standard_deviation%2C_z-scores%2C_and_p-valueTables](https://eng.libretexts.org/Bookshelves/Industrial_and_Systems_Engineering/Book%3A_Chemical_Process_Dynamics_and_Controls_(Woolf)/13%3A_Statistics_and_Probability_Background/13.01%3A_Basic_statistics-mean%2C_median%2C_average%2C_standard_deviation%2C_z-scores%2C_and_p-valueTables)

Tables

Table 1: President List with Additional Columns

id	name	birth_date	birth_place	death_date	death_location	birth_year	lived_years	lived_months	lived_days	alive
1	George Washington	1732-02-22	Westmoreland Co., Va.	1799-12-14	Mount Vernon, Va.	1732	67	814	24767	False
2	John Adams	1735-10-30	Quincy, Mass.	1826-07-04	Quincy, Mass.	1735	91	1089	33119	False
3	Thomas Jefferson	1743-04-13	Albemarle Co., Va.	1826-07-04	Albemarle Co., Va.	1743	83	999	30397	False
4	James Madison	1751-03-16	Port Conway, Va.	1836-06-28	Orange Co., Va.	1751	85	1023	31150	False
5	James Monroe	1758-04-28	Westmoreland Co., Va.	1831-07-04	New York, New York	1758	73	879	26729	False
6	John Quincy Adams	1767-07-11	Quincy, Mass.	1848-02-23	Washington, D.C.	1767	81	967	29446	False
7	Andrew Jackson	1767-03-15	Wachula, No.Ss Carolina	1845-06-08	Nashville, Tennessee	1767	78	939	28574	False
8	Marin Van Buren	1782-12-05	Kinderhook, New York	1862-07-24	Kinderhook, New York	1782	80	955	29085	False
9	William Henry Harrison	1773-02-09	Charles City Co., Va.	1841-04-04	Washington, D.C.	1773	68	818	24880	False
10	John Tyler	1790-03-29	Charles City Co., Va.	1862-01-18	Richmond, Va.	1790	72	862	26227	False
11	James K. Polk	1795-11-02	Mecklenburg Co., N.C.	1849-06-15	Nashville, Tennessee	1795	54	643	19883	False
12	Zachary Taylor	1784-11-24	Orange County, Va.	1850-07-09	Washington, D.C.	1784	66	788	23967	False
13	Millard Fillmore	1800-01-07	Cayuga Co., New York	1874-03-08	Buffalo, New York	1800	74	890	27088	False
14	Franklin Pierce	1804-11-23	Hillsborough, N.H.	1869-10-08	Concord, New Hamp.	1804	65	779	23895	False
15	James Buchanan	1791-04-23	Cove Gap, Pa.	1868-06-01	Lancaster, Pa.	1791	77	926	28163	False
16	Abraham Lincoln	1809-02-12	Lafayette Co., Kentucky	1865-04-15	Washington, D.C.	1809	56	674	20516	False
17	Andrew Johnson	1808-12-29	Raleigh, North Carolina	1875-07-31	Elizabethton, Tenn.	1808	67	799	24320	False
18	Ulysses S. Grant	1822-04-27	Point Pleasant, Ohio	1885-07-23	Wilton, New York	1822	63	759	23098	False
19	Rutherford B. Hayes	1822-10-04	Delaware, Ohio	1893-01-17	Fremont, Ohio	1822	71	843	25673	False
20	James A. Garfield	1831-11-19	Cuyahoga Co., Ohio	1881-09-19	Elberon, New Jersey	1831	50	598	18302	False
21	Chester Arthur	1829-10-05	Fairfield, Vermont	1886-11-18	New York, New York	1829	57	685	20883	False
22	Grover Cleveland	1837-02-18	Caldwell, New Jersey	1908-06-24	Princeton, New Jersey	1837	71	855	26020	False
23	Benjamin Harrison	1833-08-20	North Bend, Ohio	1901-03-13	Indianapolis, Indiana	1833	68	811	24676	False
24	William McKinley	1843-01-29	Niles, Ohio	1901-09-14	Buffalo, New York	1843	58	704	21412	False
25	Theodore Roosevelt	1858-10-27	New York, New York	1919-01-06	Oyster Bay, New York	1858	61	723	21885	False
26	William Howard Taft	1857-09-15	Cincinnati, Ohio	1930-03-08	Washington, D.C.	1857	73	870	26471	False
27	Woodrow Wilson	1856-12-28	Staunton, Virginia	1924-02-03	Washington, D.C.	1856	68	806	24507	False
28	Warren G. Harding	1865-11-02	Morrow County, Ohio	1923-08-02	San Francisco, Cal.	1865	58	693	21091	False
29	Calvin Coolidge	1872-07-04	Plymouth, Vermont	1933-01-05	Northampton, Mass.	1872	61	726	22099	False
30	Herbert Hoover	1874-08-10	West Branch, Iowa	1964-10-20	New York, New York	1874	90	1082	32843	False
31	Franklin Roosevelt	1882-01-30	Hyde Park, New York	1945-04-12	Warm Springs, Ga.	1882	63	759	23882	False
32	Harry S. Truman	1884-05-08	Lamar, Missouri	1972-12-26	Kansas City, Missouri	1884	88	1063	32373	False
33	Dwight Eisenhower	1890-10-14	Denison, Texas	1969-03-28	Washington, D.C.	1890	79	941	28854	False
34	John F. Kennedy	1917-05-29	Brookline, Mass.	1963-11-22	Dallas, Texas	1917	46	558	16978	False
35	Lyndon B. Johnson	1908-08-27	Gillespie Co., Texas	1973-01-22	Gillespie Co., Texas	1908	65	773	23534	False
36	Richard Nixon	1913-01-09	Yorba Linda, Cal.	1994-04-22	New York, New York	1913	81	975	29688	False
37	Gerald Ford	1913-07-14	Omaha, Nebraska	2006-12-26	Rancho Mirage, Cal.	1913	93	1121	34133	False
38	Jimmy Carter	1924-10-01	Plains, Georgia	None	None	1924	97	1165	35480	True
39	Ronald Reagan	1911-02-06	Tampico, Illinois	2004-06-05	Los Angeles, Cal.	1911	93	1120	34088	False
40	George Bush	1924-06-12	Milton, Mass.	2018-11-30	Houston, Texas	1924	94	1133	34504	False
41	Bill Clinton	1946-08-19	Hope, Arkansas	None	None	1946	75	903	27488	True
42	George W. Bush	1946-07-06	New Haven, Conn.	None	None	1946	75	904	27532	True
43	Barack Obama	1961-08-04	Honolulu, Hawaii	None	None	1961	60	723	22024	True
44	Donald Trump	1946-06-14	New York, New York	None	None	1946	75	905	27554	True
45	Joe Biden	1942-11-20	Scranton, Pa.	None	None	1942	79	948	28556	True

Table 2: Shortest Lived Presidents

id	name	birth_date	birth_place	death_date	death_location	birth_year	lived_years	lived_months	lived_days	alive
34	John F. Kennedy	1917-05-29	Brookline, Mass.	1963-11-22	Dallas, Texas	1917	46	558	16978	False
20	James A. Garfield	1831-11-19	Cuyahoga Co., Ohio	1881-09-19	Elberon, New Jersey	1831	50	598	18202	False
11	James K. Polk	1795-11-02	Mecklenburg Co., N.C.	1849-06-15	Nashville, Tennessee	1795	54	643	19583	False
16	Abraham Lincoln	1809-02-12	LaRue Co., Kentucky	1865-04-15	Washington, D.C.	1809	56	674	20516	False
21	Chester Arthur	1829-10-05	Fairfield, Vermont	1886-11-18	New York, New York	1829	57	665	20863	False
28	Warren G. Harding	1865-11-02	Morrow County, Ohio	1923-08-02	San Francisco, Cal.	1865	58	693	21091	False
24	William McKinley	1843-01-29	Niles, Ohio	1901-09-14	Buffalo, New York	1843	58	704	21412	False
25	Theodore Roosevelt	1858-10-27	New York, New York	1919-01-06	Oyster Bay, New York	1858	61	723	21985	False
43	Barack Obama	1961-08-04	Honolulu, Hawaii	None	None	1961	60	723	22024	True
29	Calvin Coolidge	1872-07-04	Plymouth, Vermont	1933-01-05	Northampton, Mass.	1872	61	726	22099	False

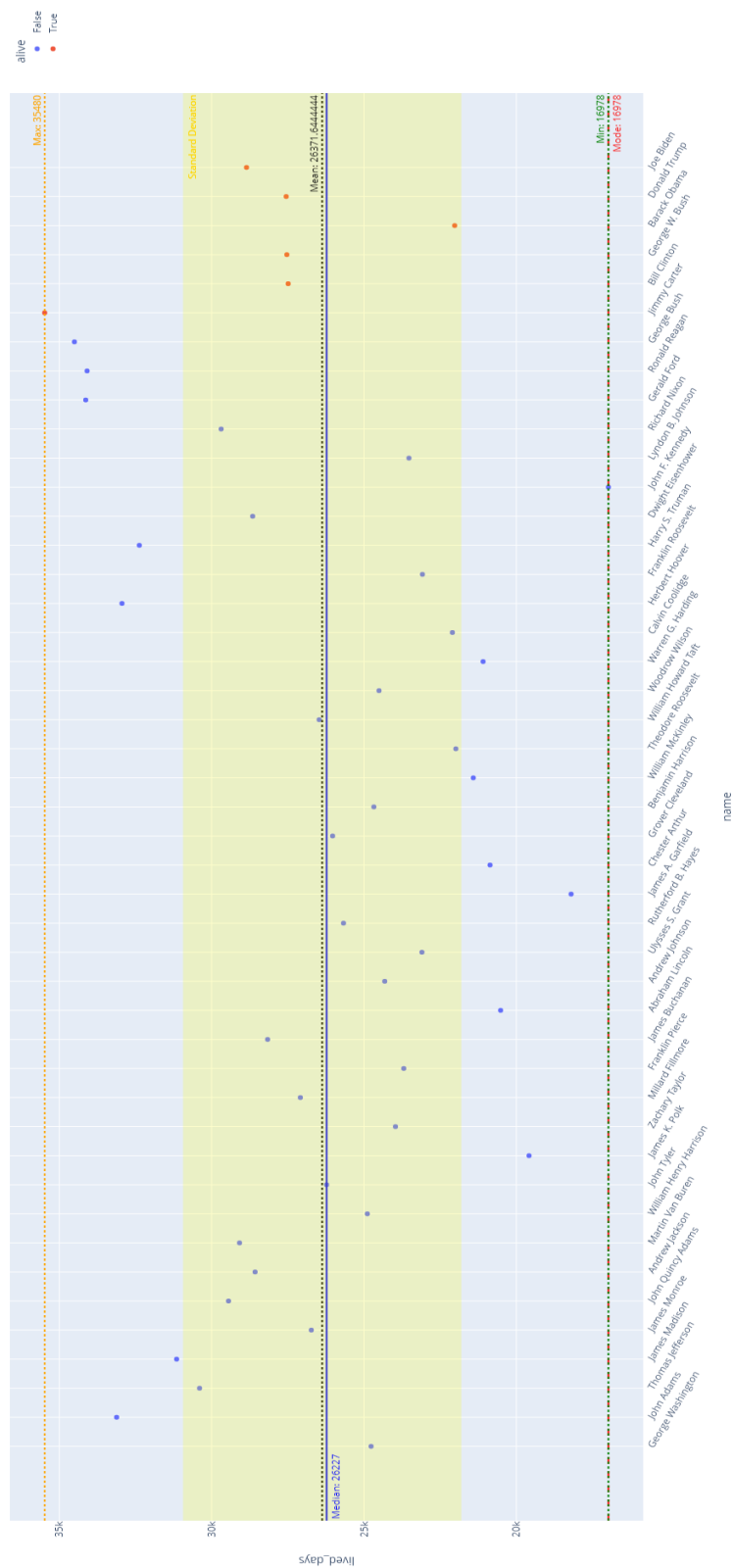
Table 3: Longest Lived Presidents

id	name	birth_date	birth_place	death_date	death_location	birth_year	lived_years	lived_months	lived_days	alive
38	Jimmy Carter	1924-10-01	Plains, Georgia	None	None	1924	97	1165	35480	True
40	George Bush	1924-06-12	Milton, Mass.	2018-11-30	Houston, Texas	1924	94	1133	34504	False
37	Gerald Ford	1913-07-14	Omaha, Nebraska	2006-12-26	Rancho Mirage, Cal.	1913	93	1121	34133	False
39	Ronald Reagan	1911-02-06	Tampico, Illinois	2004-06-05	Los Angeles, Cal.	1911	93	1120	34088	False
2	John Adams	1735-10-30	Quincy, Mass.	1826-07-04	Quincy, Mass.	1735	91	1089	33119	False
30	Herbert Hoover	1874-08-10	West Branch, Iowa	1964-10-20	New York, New York	1874	90	1082	32943	False
32	Harry S. Truman	1884-05-08	Lamar, Missouri	1972-12-26	Kansas City, Missouri	1884	88	1063	32373	False
4	James Madison	1751-03-16	Port Conway, Va.	1836-06-28	Orange Co., Va.	1751	85	1023	31150	False
3	Thomas Jefferson	1743-04-13	Albemarle Co., Va.	1826-07-04	Albemarle Co., Va.	1743	83	999	30397	False
36	Richard Nixon	1913-01-09	Yorba Linda, Cal.	1994-04-22	New York, New York	1913	81	975	29688	False

Table 4: President Statistics

mean	weighted_mean	median	mode	min	max	standard_deviation
26371.6444444	26371.6444444	26227.0	16978.0	16978.0	35480.0	4566.8574492

President Scatter Plot with Statistics



Conclusion

The average life span of a president is 26,371.64 days. About 66% of the presidents' lived days are within the mean \pm standard deviation range. The median is 26,227 days and although there is no mode in days, in months it is 723 and in years it is 68. The shortest-lived president is John F. Kennedy at 16,978 days (minimum) and the longest-lived is Jimmy Carter at 35,480+ days (maximum). There are six living presidents: Jimmy Carter, Bill Clinton, George W. Bush, Barack Obama, Donald Trump, and Joe Biden.