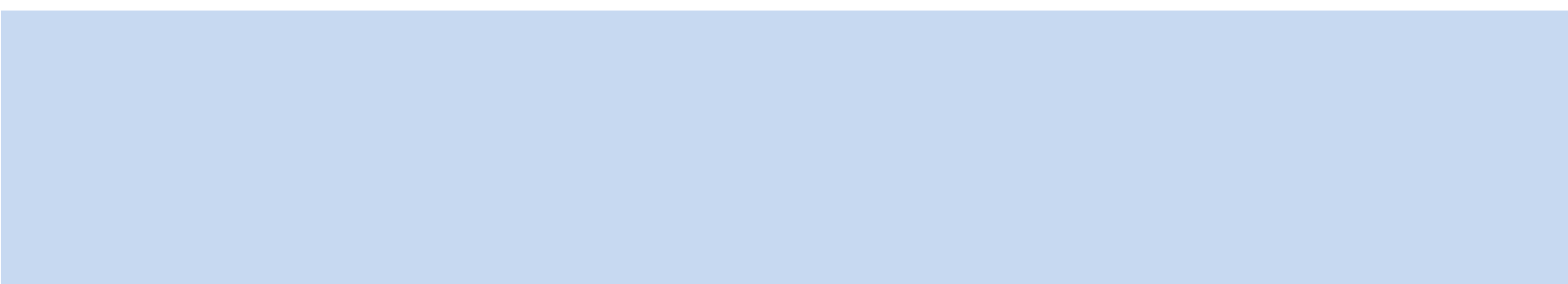


Solutions

Algebra II Journal
Module 3: Standard Deviation
Making Deviation Standard

This journal belongs to:



Module 3: Making Deviation Standard

Algebra II Journal: Reflection 1

Respond to the following reflection questions and submit to your teacher.

Enter the Number of Days Served for each president in your graphing calculator.

Answer:

(Screen shot of data entered)

L1	L2	L3	1
895			
1461			
2922			
1461			
2922			
2922			
2922			
L1(44) =			

Using the features of a graphing calculator, determine the mean and the mean absolute deviation of the Number of Days Served by a President data set.

Answer: The average president serves approximately 1866 days.

1-Var Stats
$\bar{x}=1866.325581$
$\Sigma x=80252$
$\Sigma x^2=184879428$
$Sx=914.214045$
$\sigma x=903.5211152$
$\downarrow n=43$

The mean absolute deviation is 758.21.

L1	L2	L3	3
2865	998.67		
1460	405.33		
2922	1055.7		
2922	1055.7		
2922	1055.7		
1461	405.33		
2922	1055.7		
L3(1)=			

1-Var Stats L2

1-Var Stats
$\bar{x}=758.2076798$
$\Sigma x=32602.93023$
$\Sigma x^2=35103067.4$
$Sx=497.2130748$
$\sigma x=491.3975172$
$\downarrow n=43$

Explain what the mean and the mean absolute deviation represent in the context of the situation.

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Answer:

The average president serves about 1866 days, give or take approximately 758.21 days.

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Algebra II Journal: Reflection 2

Respond to the following reflection questions and submit to your teacher.

Enter in the presidents' Number of Days Served in your graphing calculator.

Answer:

(Screen shot of data entered)

L1	L2	L3	1
895			
1461			
2922			
1461			
2922			
2922			
895			
L1(44) =			

Determine the mean and the standard deviation for the data.

Answer:

The average president serves approximately 1866 days. The standard deviation is 903.52.

1-Var Stats
 $\bar{x}=1866.325581$
 $\Sigma x=80252$
 $\Sigma x^2=184879428$
 $Sx=914.214045$
 $\sigma x=903.5211152$
 $n=43$

Provide an interpretation of what the mean and the standard deviation reveal about the context of the situation.

Answer:

The average president serves approximately 1866 days, give or take approximately 903.52 days.

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Algebra II Journal: Reflection 3

In this lesson, you learned about mean absolute deviation and standard deviation. You learned how to calculate these two values, and how they describe the distribution of a data set. In this reflection, you will apply what you have learned in this lesson. Respond to the reflection questions below and submit your reflection to your teacher.

The chart below displays the length of time each president was in service for our country.

President		Number of Terms in Office	Number of Years Served	Number of Days Served
1	G. Washington	2	6.34	2865
2	J. Adams	1	4	1460
3	T. Jefferson	2	8	2922
4	J. Madison	2	8	2922
5	J. Monroe	2	8	2922
6	J. Q. Adams	1	4	1461
7	A. Jackson	2	8	2922
8	M. Van Buren	1	4	1461
9	W. H. Harrison	1	0.08	31
10	J. Tyler	1	3.92	1430
11	J. Polk	1	4	1461
12	Z. Taylor	1	1.33	491
13	M. Fillmore	1	2.67	969
14	F. Pierce	1	4	1461
15	J. Buchanan	1	4	1461
16	A. Lincoln	2	4.11	1503
17	A. Johnson	1	3.86	1419
18	U. Grant	2	8	2922
19	R. Hayes	1	4	1461
20	J. Garfield	1	0.54	199
21	C. Arthur	1	3.46	1262
22	G. Cleveland	1	4	1461
23	B. Harrison	1	4	1461
24	G. Cleveland	1	4	1461
25	W. McKinley	2	4.5	1654
26	T. Roosevelt	2	7.5	2728
27	W. H. Taft	1	4	1461
28	W. Wilson	2	8	2922
29	W. Harding	1	2.42	881
30	C. Coolidge	2	5.58	2041
31	H. Hoover	1	4	1461
32	F. D. Roosevelt	4	12.08	4422
33	H. Truman	2	7.75	2840
34	D. Eisenhower	2	8	2922

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President		Number of Terms in Office	Number of Years Served	Number of Days Served
35	J. F. Kennedy	1	2.83	1036
36	L. Johnson	2	5.17	1886
37	R. Nixon	2	5.5	2027
38	G. Ford	1	2.42	895
39	J Carter	1	4	1461
40	R. Reagan	2	8	2922
41	G. H. Bush	1	4	1461
42	W. Clinton	2	8	2922
43	G. W. Bush	2	8	2922
44	B. Obama	2	(still completing term in 2014)	(still completing term in 2014)

The 22nd Amendment to the Constitution limits the presidential length of service to two terms. This amendment was passed in 1947, during President Harry Truman's term. This followed President Franklin Roosevelt's 4 terms, the most of any president of the United States.

Complete the following task to determine how the passing of the 22nd Amendment affected the "Number of Years Served." Respond to the following reflection questions and submit to your teacher.

Determine the mean, standard deviation and mean absolute deviation for the first 32 presidents (the presidents who served prior to the 22nd Amendment).

Answer:

Mean = 4.82; Standard Deviation = 2.49; Mean Absolute Deviation = 1.95

Which measure of variability, the mean absolute deviation or the standard deviation, represents the distribution of the data best? Use mathematics to explain your answer.

Answer:

Answers may vary. Sample answer: The standard deviation seems to describe the distribution of the data better. It appears that the majority of the presidents served 4 or 8 years. This creates a difference of 4 years. The standard deviation is closer to 4 years.

Determine the mean, standard deviation and mean absolute deviation for the presidents #33 (Truman) to #43 (G. W. Bush). These are the presidents who served after the 22nd Amendment was ratified.

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Answer:

Mean = 5.79; Standard Deviation = 2.14; Mean Absolute Deviation = 1.97

Which measure of variability, the mean absolute deviation or the standard deviation, represents the distribution of the data best? Use mathematics to explain your answer.

Answer:

Answers may vary. Sample answer: The standard deviation seems to describe the distribution of the data better. It appears that the majority of the presidents served 5 or 8 years. This creates a difference of 3 years. The standard deviation is closer to 3 years.

Compare the mean and variability for the Number of Years the Presidents Served prior to the 22nd Amendment and after its ratification.

- Which data is more variable? Use mathematics to explain how you determined your answer.
- Why do you believe the data set you chose is more variable? Use mathematics to support your answer.

Answer:

- The data prior to the 22nd Amendment is more variable since the standard deviation is much greater for this set of data when compared to the data following the 22nd Amendment. (The mean absolute deviation are approximately the same.)
- *Answers may vary. Sample answer:* Prior to the 22nd Amendment, many presidents did not complete their first term. This is due to the lurking variable of death, illness, etc. that caused the presidents to leave the office. The 22nd Amendment did not directly affect the terms of the president, since there was only one president who served more than the newly allotted 8 years.