

US Presidents

A Statistical Analysis

President Barack Obama was sworn in to office for his second term on January 21, 2013. This inauguration was held on Martin Luther King Day. Whether you are a member of the Democratic or the Republican Party, there is historical significance to the swearing in on that holiday. Dr. Martin Luther King, Jr. was asked about whether he thought there would ever be a President of color. "I've seen levels of compliance with the civil rights bill and changes that have been most surprising," King had responded, according to the United Press International wire story, which also ran in the *Washington Post* and the *Chicago Daily News*. "So, on the basis of this, I think we may be able to get a Negro President in less than 40 years. I would think that this could come in 25 years or less." (<http://hnn.us/articles/53930.html> downloaded January 22, 2013)



While we know that Obama was the first African-American President, what else do we know about our Presidents? This activity will lead us in an exploration of the statistics behind the Presidents and ask you to do some research. You should feel free to ask both your US History teacher and your algebra teacher for help.

<http://www.scholastic.com/teachers/article/timeline-guide-all-Presidents> lists the age at inauguration for each of the Presidents.

Your task:

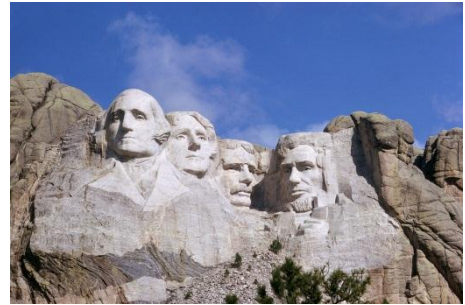
1. Enter the age of each President into List 1 of your graphing calculator. There are 44 Presidents listed on this site, but you may choose to only enter 43. Grover Cleveland was President 22 and 24. Why? Also, **note** that the values you are entering represent the age of the President at his first inauguration.
2. Determine the 5-number summary of the Presidents' ages. This means that you need to find the minimum, median, maximum, 1st and 3rd quartiles. You will then use these values to create a box and whisker chart. Based on historical data, do you think the minimum and maximum will ever change? Why or why not? Is there a law that states an absolute minimum age for a person to be elected President? Is there an absolute maximum? If you entered the age of each inauguration (meaning each President that served multiple terms would have multiple entries), what effect would that have on the 5-number summary? Would all of the values change? Would any of the values change?

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- Using the same data, create a histogram using the intervals 40-49, 50-59, 60-69, 70-79. Your histogram should be properly labeled and should include a table. Were you surprised at the shape of the histogram? Did you expect more Presidents to be in a different group? Why or why not? If the frequencies in the histogram do not add up to 44, then check your data entry.

- Find the average age of the Presidents at inauguration. How does this value compare to the median? What is the standard deviation of your data? Remembering that you have entered all of the Presidents, would you use the sample standard deviation or the population standard deviation? What does the standard deviation represent? If this data set represented a normal curve, then 68.6% of all Presidents should be between 48.47 and 60.85 years of age at inauguration. Is this true for our data set?



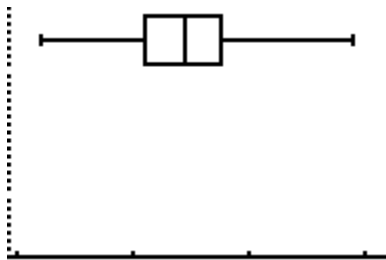
- Herbert Hoover (1929-1933) was the first President elected born west of the Mississippi River. Why? Which state is the birthplace of the most Presidents? Which states have not yet produced a President?
- Presidential Trivia:
 - Which President was once a King?
 - Which Presidents were not born in the United States of America?

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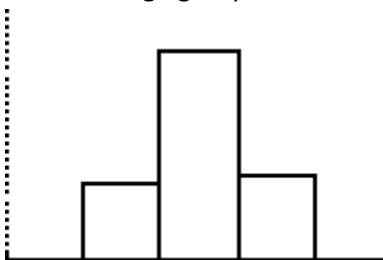
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Answers

1. Answers may vary
2. If all ages were included, then the minimum would remain the same, but all other values would increase. It is NOT true that they will all increase by 4, because only some of the Presidents were elected to multiple terms. There is a legal minimum age for election to the presidency, but there is no maximum age.
Your box and whisker plot will look similar to the one below. Note the minimum is 42, Q1 = 51, Q2 (also known as the median) is 54.5, Q3 is 57.5 and the maximum is 69



3. Your histogram will look similar to the one below. The first bar represent 40-49 year olds. There should be 9 in that group. There have been 25 in the 50-59 age group and 10 in the 60-69 age group



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Answers Continued

4. Average age at inauguration is 54.659. Very similar to the median, meaning there were no significant outliers to skew the data. The population standard deviation is 6.186. We use the population deviation because we have data on all of the Presidents. If this data set represented a normal curve, then 68.6% of all Presidents should be between 48.47 and 60.85 years of age at inauguration.

5. As the US expanded west, it gave more opportunity for people born west of the Mississippi to be involved in politics. However, since transportation and long distance communication were issues, those born a great distance from Washington, DC generally had no reason to travel that far East

6.
 - a. Gerald Ford was born a King. His name at birth was Leslie King, but he was adopted and his name was changed
 - b. Another trick question. All Presidents who were born before 1776 were technically not born in the United States. John McCain ran for President in 2008, but he was born in Panama on an American military base