

MATH 143: Introduction to Probability and Statistics

Worksheet 2 for Mon., Sept. 14

Here is a list of the current justices serving on the U.S. Supreme Court, along with the number of full years of service for each.

Name	Years	Name	Years	Name	Years
John Roberts	3	John Paul Stevens	33	Antonin Scalia	22
Anthony Kennedy	21	Sonia Sotomayor	0	Clarence Thomas	17
Ruth Bader Ginsburg	16	Stephen Breyer	15	Samuel Alito	3

1. Calculate the mean and median number of years of service for the current Supreme Court justices. **Answer: mean = 14.44, median = 16**
2. The formulas for calculating the **variance** s^2 and *standard deviation* s for a dataset representing a univariate quantitative variable are

$$s^2 = \frac{1}{n-1} \sum (x_i - \bar{x})^2 \quad \text{and} \quad s = \sqrt{\frac{1}{n-1} \sum (x_i - \bar{x})^2}.$$

To carry out the calculation, first fill in the empty slots in the following table.

Original data	Deviation from mean	Squared deviation from mean
3	-11.44 = 3-14.44	130.98 = (-11.44) ²
21	6.56 = 21-14.44	42.98 = (6.56) ²
16	1.56	2.42
33	18.56	344.31
0	-14.44	208.64
15	0.56	0.31
22	7.56	57.09
17	2.56	6.53
3	-11.44	130.98
Column Totals	0	924.22

Now use the information to compute the variance and standard deviation.

Answer: $s^2 = 924.22/8 = 115.53$, $s = \sqrt{115.53} = 10.74$

Which of these numbers, s^2 or s , would have the unit of measurement *years*? **Answer: s**

3. Now imagine a Court on which all 9 justices had served the same amount, say, 15 years. What would the mean and variance be in that case? **Answer: $\bar{x} = 15$, $s = 0$**