

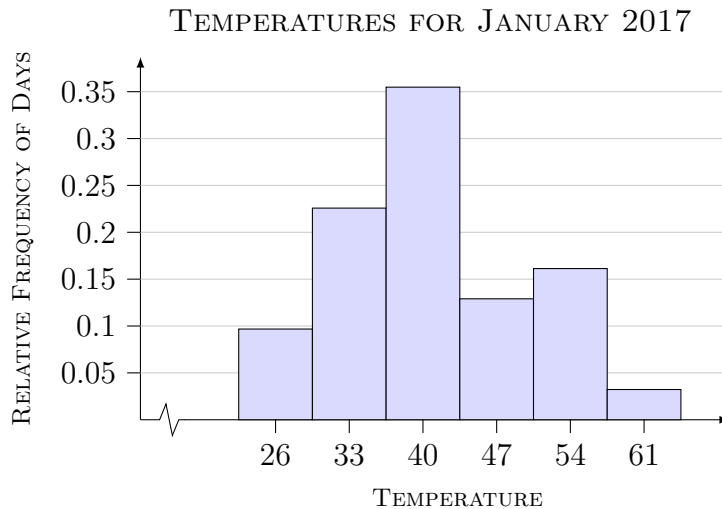
MATH 115 EXAM #1 KEY (SPRING 2017)

1 (a) ordinal; (b) nominal; (c) ratio; (d) ratio; (e) interval.

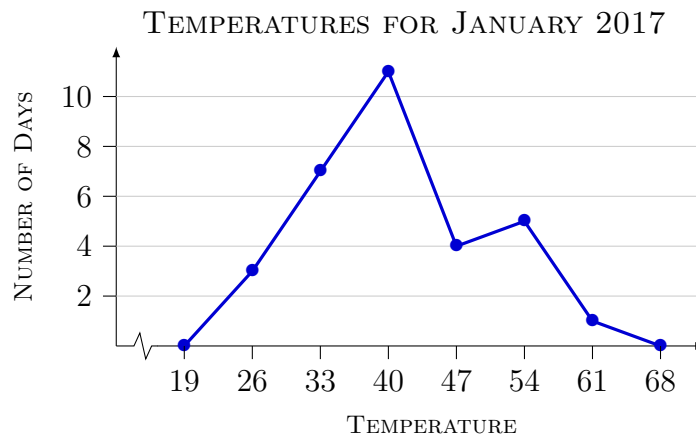
2 The data's range is $63 - 23 = 40$. Since $40/6 \approx 6.67$, we may take the class width to be 7. With 23 as the lower limit of the 1st class, we have the following table, the first two columns of which constitute the frequency distribution:

Class	f	f_r	f_c
23–29	3	0.097	3
30–36	7	0.226	10
37–43	11	0.355	21
44–50	4	0.129	25
51–57	5	0.161	30
58–64	1	0.032	31

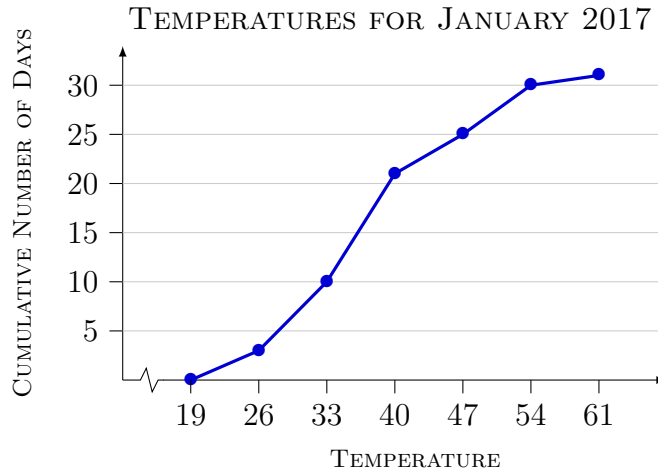
3



4



5



6

Stem	Leaves	Key: 3 6 = 36
2	3 3 5	
3	1 2 3 6 6 6 6 7 8 9	
4	1 1 1 1 3 3 3 3 5 6 6 6	
5	1 1 2 4 5	
6	3	

7 Median = $\frac{28+29}{2} = 28.5$, Mode = 29, and

$$\text{Mean} = \frac{1}{14} \sum_{k=1}^{14} x_k = \frac{384}{14} = \frac{192}{7} \approx 27.429.$$

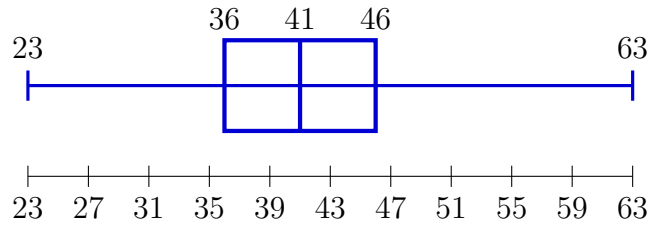
8 First, Range = $36 - 18 = 18$. The sample standard deviation is

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}} = \sqrt{\frac{\sum (x - 192/7)^2}{13}} \approx 4.5525 \approx 4.55,$$

and the sample variance is $s^2 = (4.5525)^2 \approx 20.73$.

9a The Median is 41, and so $Q_2 = 41$. Now we divide the data set into two halves: its smallest 15 values and its largest 15 values. The median of the smallest 15 values is $Q_1 = 36$, and the median of the largest 15 values is $Q_3 = 46$. Thus:

$$Q_1 = 36, \quad Q_2 = 41, \quad Q_3 = 46.$$

9b**10** Take the weighted average:

$$0.24(67\%) + 0.2(92\%) + 0.18(81\%) + 0.12(100\%) + 0.1(53\%) + 0.1(39\%) + 0.06(85\%) = 75.36\%.$$

$$\mathbf{11a} \quad \frac{53}{38 + 20 + 31 + 53 + 36 + 15} = \frac{53}{193} \approx 0.275.$$

$$\mathbf{11b} \quad 1 - \frac{36}{193} = \frac{157}{193} \approx 0.813.$$