

III. Review

← total

eg Sixty adults with gum disease were asked the number of times per week they used to floss before their diagnosis. The (incomplete) results are shown in [Table 1.35](#).

# Flossing per Week	Frequency	Relative Frequency	Cumulative Relative Freq.
0	27	0.4500	0.4500
1	18	0.3000	0.7500
3 <i>60 - all →</i>	11	0.1833	0.9333
6	3	0.0500	0.9833
7	1	0.0167	1.000

↗
↘
↙
↘
total

Table 1.35 Flossing Frequency for Adults with Gum Disease

- Fill in the blanks in [Table 1.35](#). ✓
- What percent of adults flossed six times per week?
- What percent flossed at most three times per week?

S: b. 0.05 ← 4th class

c. $0.4500 + 0.3000 + 0.1833$
 $=$ 0.9333

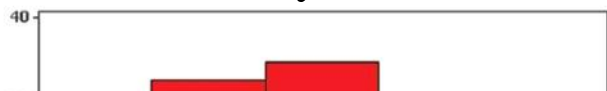
IV. Histogram

A histogram is a display of frequency distribution. (Histogram is for frequency distribution only.)

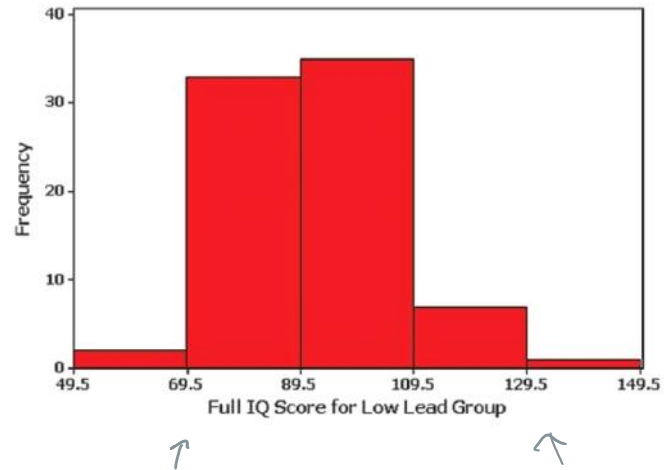
Frequency distribution

IQ Score	Frequency

Histogram

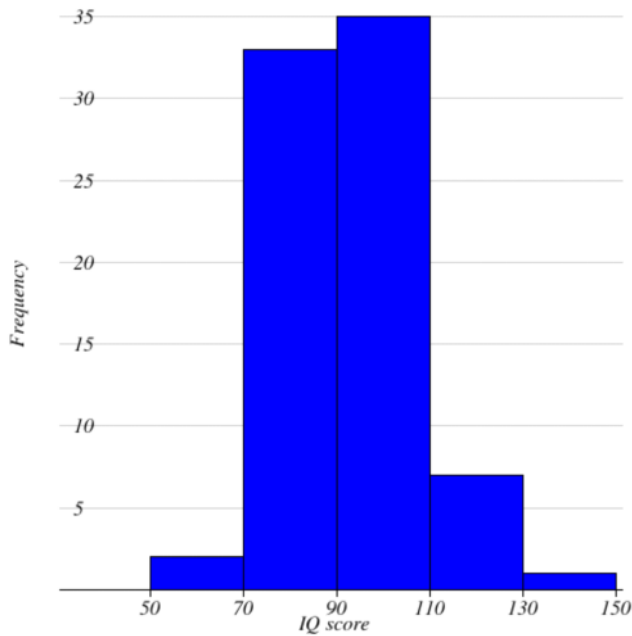


IQ Score	Frequency
50-69	2
70-89	33
90-109	35
110-129	7
130-149	1



However, we use technology now. (Don't draw it.)

<http://www.imathas.com/stattools/histo.html>

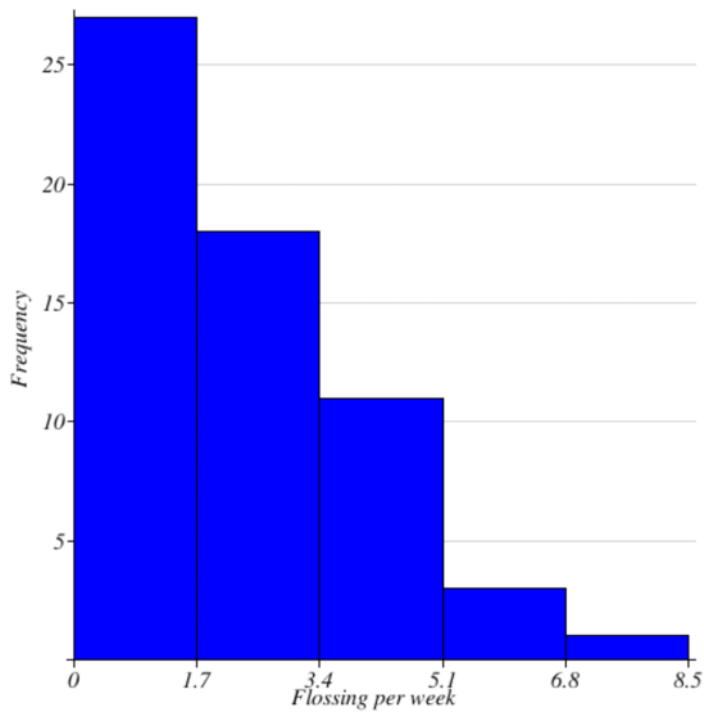


Eg Plot a histogram for the following distribution:

# Flossing per Week	Frequency
0	27
1	18

# Flossing per Week	Frequency
0	27
1	18
3 <i>60-all →</i>	<i>11</i>
6	3
7	1

S:

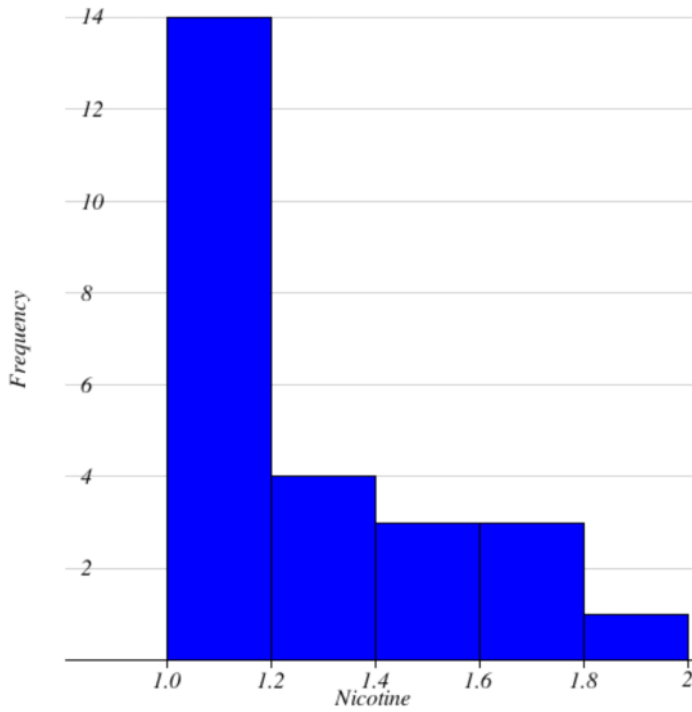


← / self-made class-width to be 1.7.

Eg Plot a histogram for the following distribution:

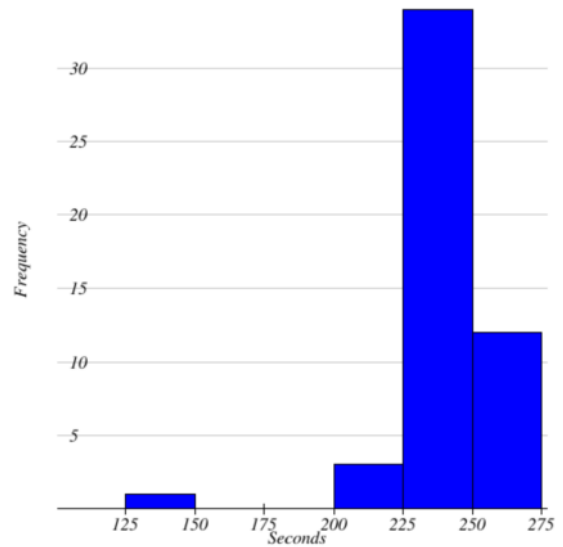
Amount of nicotine	Frequency
1.0 - 1.1	<i>14</i>
1.2 - 1.3	<i>4</i>
1.4 - 1.5	<i>3</i>
1.6 - 1.7	<i>3</i>
1.8 - 1.9	<i>1</i>

5:



eg

seconds	Frequency
125 - 149	1
150 - 174	0
175 - 199	0
200 - 224	3
225 - 249	34
250 - 274	12



Not that important: stem-leaf Graph

← because stem has to be full

eg

For Professor Dean's spring pre-calculus class, scores for the first exam were as follows (smallest to largest):
 33; 42; 49; 49; 53; 55; 55; 61; 63; 67; 68; 68; 68; 69; 69; 72; 73; 74; 78; 80; 83; 88; 88; 88; 88; 90; 92; 94; 94; 94; 94; 96; 100

Stem	Leaf
3	3



Stem	Leaf
3	3
4	2 9 9
5	3 5 5
6	1 3 7 8 8 9 9
7	2 3 4 8
8	0 3 8 8 8
9	0 2 4 4 4 4 6
10	0

Table 2.1 Stem-and-Leaf Graph

For Professor Dean's spring pre-calculus class, scores for the first exam were as follows (smallest to largest):
 33; 42; 49; 49; 53; 55; 55; 61; 63; 67; 68; 68; 69; 69; 72; 73; 74; 78; 80; 83; 88; 88; 88; 88; 90; 92; 94; 94; 94;
 94; 96; 100

10's Stem	1's leaf
3	
4	
5	
6	
7	
8	
9	
10	



10's Stem	1's leaf
3	3 3
4	2 9
5	...
6	...
7	...
8	...
9	...
10	...



Starting the lowest
 at 30's, ending
 in 100's

V. Measure of Position

i. Percentile ← rank in a 100

Defn: It measures the position from 0 to 100. (Exact 0 to 99)

Notation: $P_{\#}$ for $\#$'s percentile. Namely, P_5 is the 5th percentile
 P_{99} is 99th percentile. P_{87} is 87th percentile.

$$\text{Percentile of } x = \frac{\text{num of values less than } x}{\text{total number of values}} \cdot 100\%$$

$$\frac{n < x}{\text{total}} \cdot 100\%$$

eg You score 93 in a test,
how well you stand for the class.

eg Given 2, 8, 15, 18, 19, 20. Find the percentile of 15.

S: sort ✓

\leftarrow 2, 8 less than 15

$$P_{15} = \frac{2}{6} \cdot 100\%$$

\leftarrow 6 values

$$\approx 33\% \quad \leftarrow \text{not done}$$

$$= \boxed{33 \text{ rd}} \text{ or } \boxed{33} \quad \leftarrow 33 \text{ is okay}$$

eg Given the list of data values:

10 12 20 25 7 4 2 8

Find the percentile of 7.

S: Sort: 2 4 7 8 10 12 20 25

\leftarrow 8 of them

$$\text{Percentile of } 7 = \frac{2}{n} \cdot 100\% \quad \leftarrow 2, 4 \text{ less than } 7$$

$$\begin{aligned}
 \text{Percentile of } 7 &= \frac{2}{8} \cdot 100\% && \leftarrow 2, 4 \text{ less than } 7 && 8 \text{ of them} \\
 &= 25\% && \leftarrow \text{not percentile} \\
 &= \boxed{25^{\text{th}}} \text{ or } \boxed{25}
 \end{aligned}$$

eg Consider the list below, find the percentile of 16:

~~11, 2, 8, 17, 5, 10, 15, 7, 20, 13, 16, 18, 21, 4, 24~~

S: sort: 2, 4, 5, 7, 8, 10, 11, 13, 15, 16, 17, 18, 20, 21, 24

$$\begin{aligned}
 \text{Percentile of } 16 &= \frac{9}{15} \cdot 100\% \\
 &= 60\% \\
 &= \boxed{60^{\text{th}}}
 \end{aligned}$$

Eg. Find the percentile of the cookies with 24 chips:

19	19	20	20	20	20	22	22	22	22
23	23	23	23	23	23	23	24	24	24
24	24	25	25	25	25	25	25	25	26
26	26	26	26	26	27	27	28	28	30

40 total

S:

$$\begin{aligned}
 &\frac{17}{40} \cdot 100\% \\
 &= 42.5\% \\
 &\approx \underline{43\%}
 \end{aligned}$$

$$\approx 43\%$$

$$= \boxed{43^{\text{rd}}}$$

Eg. Find the percentile of the cookies with 19 chips:

19	19	20	20	20	20	22	22	22	22
23	23	23	23	23	23	23	24	24	24
24	24	25	25	25	25	25	25	25	26
26	26	26	26	26	27	27	28	28	30

S:

$$P_{19} = \frac{0}{40} \cdot 100\%$$

$$= 0\%$$

$$= \boxed{0^{\text{th}}}$$

Eg. Find the percentile of the cookies with 22 chips:

19	19	20	20	20	20	22	22	22	22
23	23	23	23	23	23	23	24	24	24
24	24	25	25	25	25	25	25	25	26
26	26	26	26	26	27	27	28	28	30

S:

$$\frac{6}{40} \cdot 100\%$$

$$= 15\%$$

$$= \boxed{15^{\text{th}}}$$