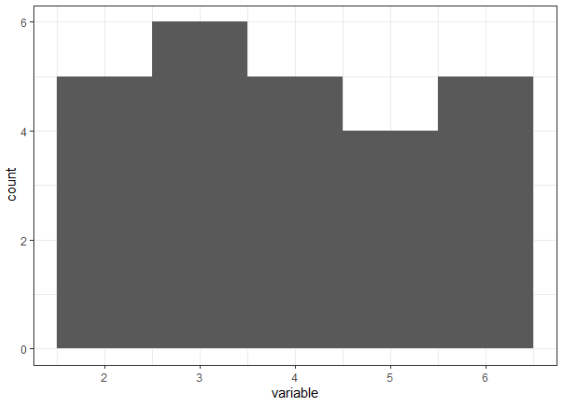
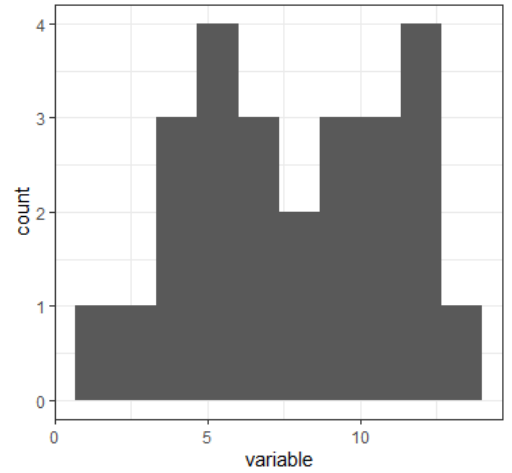
Distributions

The **distribution** of a quantitative variable is the shape of its histogram.

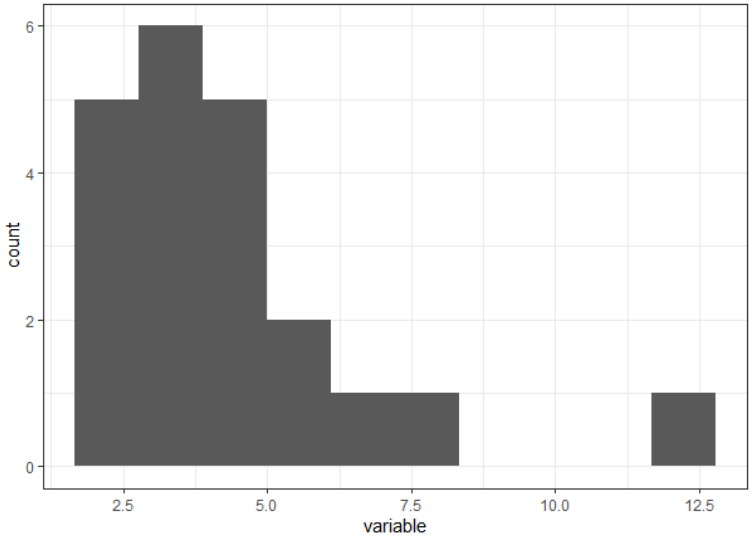
Uniform



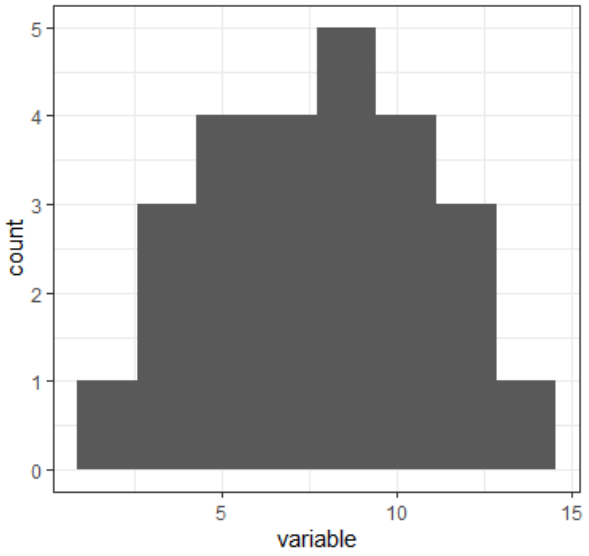
Bimodal



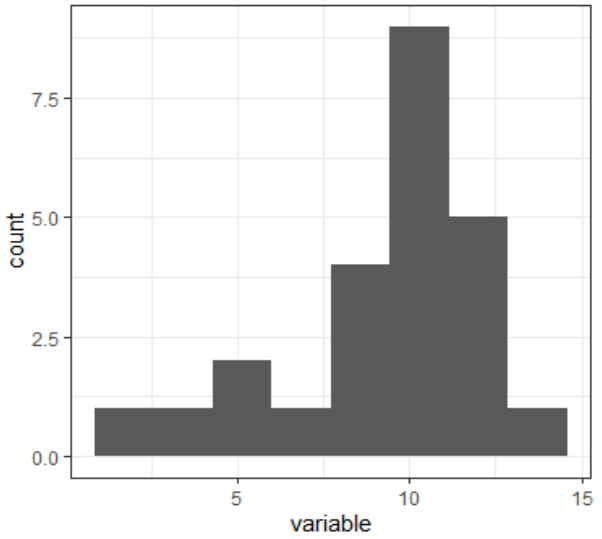
Unimodal, right-skewed



Unimodal, symmetric



Unimodal, left-skewed



Numerical summaries of a quantitative variable

Measures of center

- Mean $\bar{y}$ (y-bar) or μ (mu)
- Median

Measures of spread

- Standard deviation SD or s or σ
- Interquartile range IQR

Mean

$$\bar{y} = \frac{sum\ of\ the\ values}{number\ of\ cases} = \frac{\Sigma\, y}{n}$$

Median

The middle number when listing them in order

Variance $s^2 = \frac{\Sigma\,(y-\bar{y})^2}{n-1}$

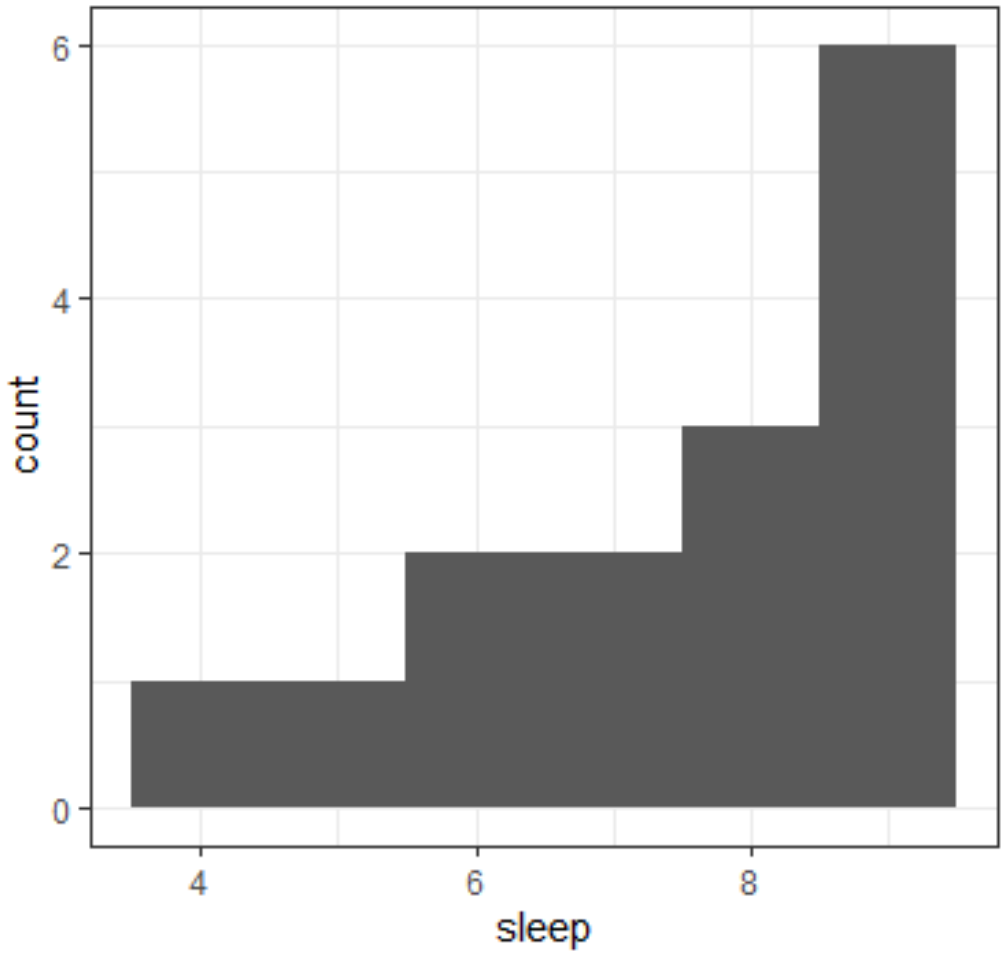
Standard deviation $s = \sqrt{\frac{\Sigma(y-\bar{y})^2}{n-1}}$

IQR

The difference between the numbers ¼ and ¾ of the way through the list

Example: Hours of sleep

15 students reported getting this much sleep in a night:
9, 8, 9, 6.5, 8, 9, 9, 7.5, 9, 8.5, 9, 4, 6.5, 5.5, 7.5



Mean	7.733
Median	8
Standard deviation	1.522
IQR	2