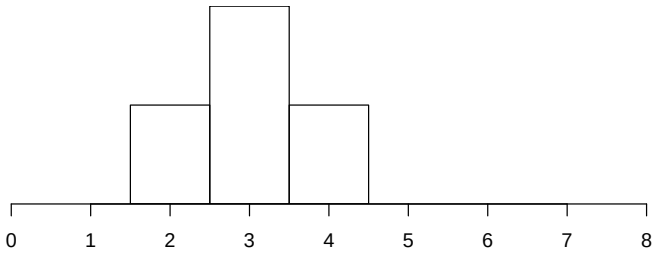
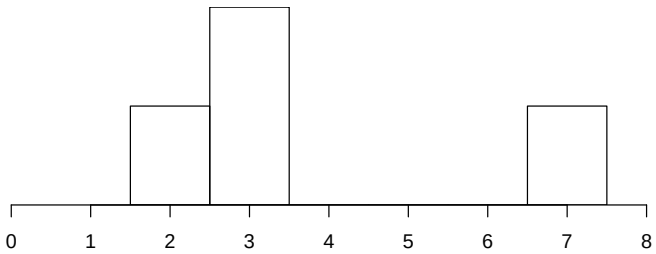
The average versus the median

List: 2, 3, 3, 4 median = average = 3





List: 2, 3, 3, 7 median = 3, average = 3.75

The average versus the median

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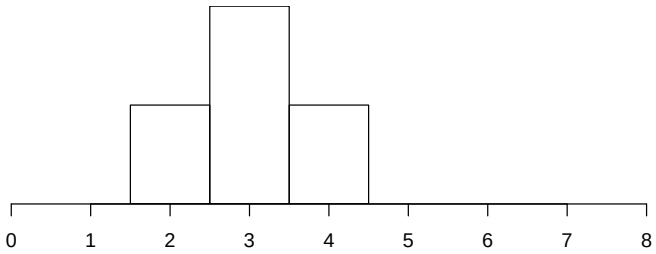

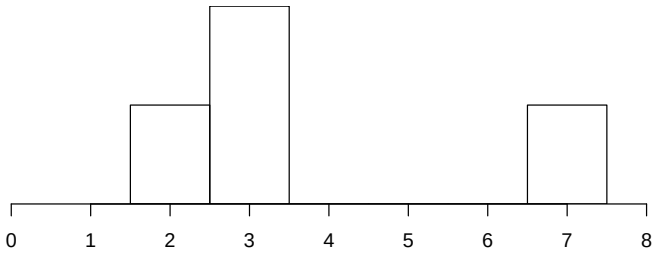

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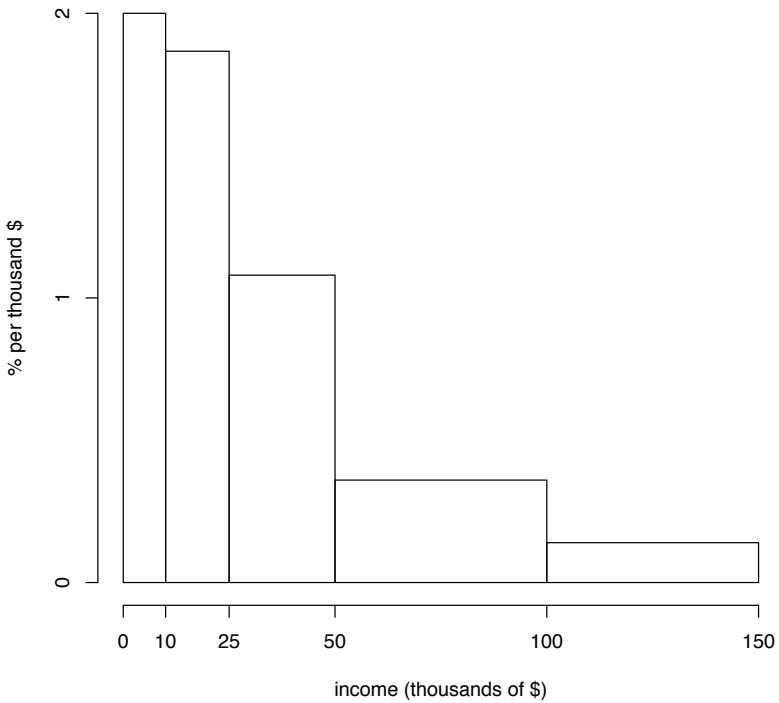
The median is unaffected by outliers.

A right-skewed distribution



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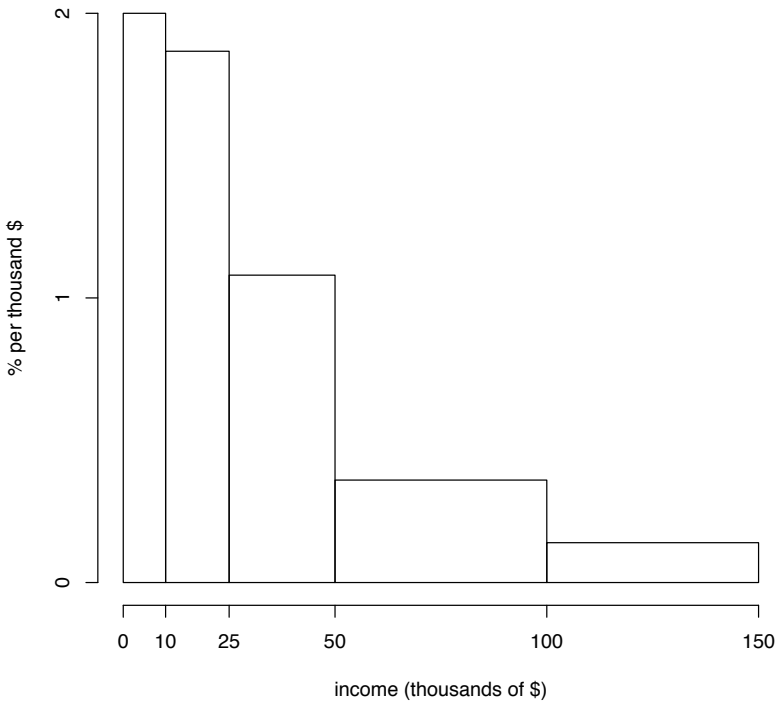

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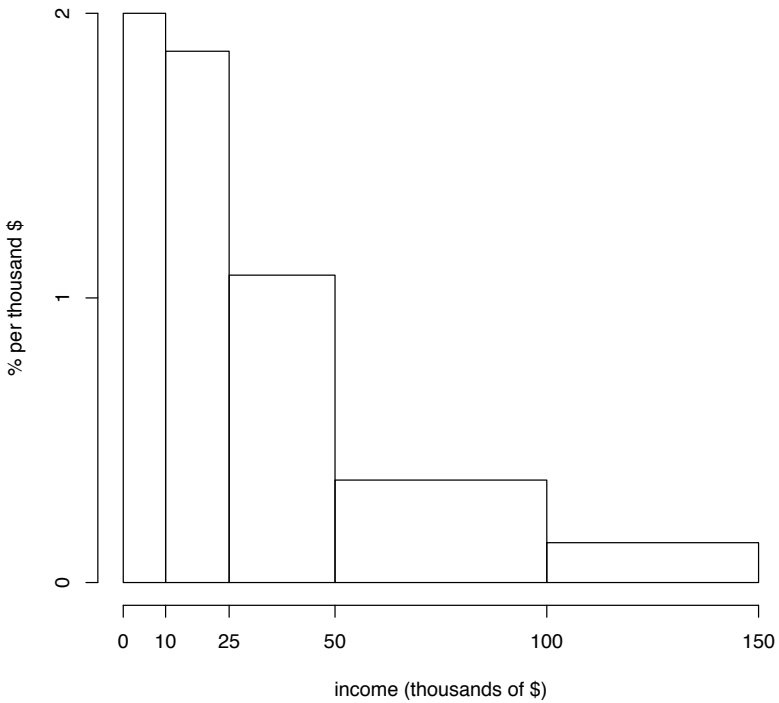

In a **right-skewed** distribution (a distribution with a **right-hand tail**), the **average is greater than the median.**

• Articles report **median incomes**, instead of average incomes, because the average is affected by the small proportion of very high incomes.

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So suppose, for example, that the average is 65 and the median is 70.

Then a student who got 67 would be above average but not in the top half of the class, because to be in the top half, scores have to be at least 70.

The average and the histogram

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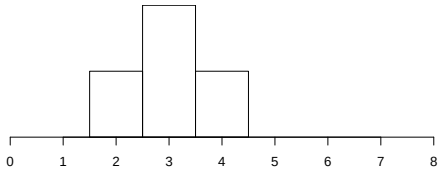
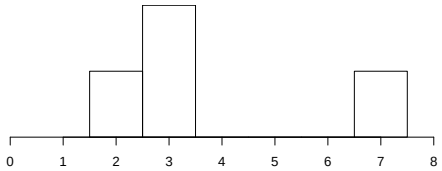
List: 2, 3, 3, 4

$$\text{average} = \frac{(1\times 2)+(2\times 3)+(1\times 4)}{4} = \frac{1}{4}\times 2 + \frac{2}{4}\times 3 + \frac{1}{4}\times 4 = 3$$





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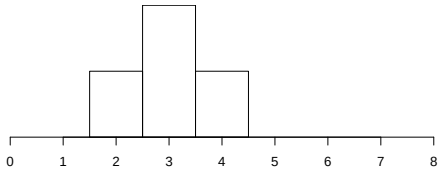

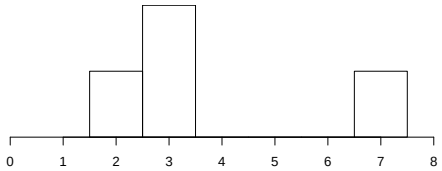

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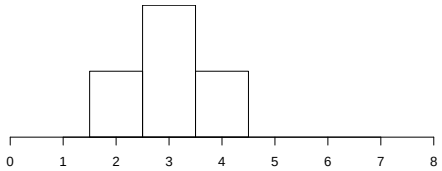

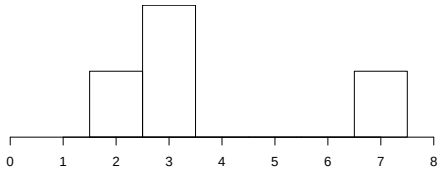

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The average is the center of gravity of the histogram. It is the point where the histogram balances.