

Class Worksheet

September 3 to 8
Math 125 *Kovitz* 2025

Descriptive Statistics: definition.

Chapter 3

The Histogram—a visual representation of a distribution by giving a graphic summary of the breakdown of the population into given categories.

Horizontal scale

Class intervals

Endpoint convention

First convert the distribution of the population into percentages for each category.

In a histogram the areas of the blocks represent percentages.

To figure out the height of a block over a class interval, divide the percent by the length of the interval.

Density scale for vertical axis

In a histogram, the height of a block represents crowding—percentage per horizontal unit.

With the density scale on the vertical axis, the areas of the blocks come out in percent. The area under the histogram over an interval equals the percentage of cases in that interval. The total area is 100%.

Variables: qualitative or quantitative (discrete or continuous)

Controlling for a variable.

Formula for the Block of a Histogram

Area = base \times height. (the general formula for a rectangle)

(The percent for the block) = (the length of the interval) \times (the height of the block, a density)

For Example: $(12\%) = (3 \text{ in.}) \times (4\% \text{ per inch})$ or $(12\%) = (3 \text{ in.}) \times (4\%/\text{in.})$

Problem

Using the data below, draw the histogram for the distribution of a selected group of women by height in inches. The class intervals include the left—but not the (unlisted) right—endpoints. You may interpret 73 or more to mean 73, 74, or 75. (Assume that the heights were truncated, rather than rounded off to the nearest inch. Thus 65.7 inches was listed as 65 inches, rather than 66 inches.)

Carefully label the vertical scale and clearly indicate the endpoints of the rectangles you draw.

Height	less than 58	58	59	60	61	62	63	64	65	66	67	68–69	70–72	73 or more
Percent of women	0	3	0	7	10	13	15	17	12	9	5	5	3	1

Before drawing the histogram, ask yourself the following questions:

Is the variable qualitative or quantitative, discrete or continuous?

What are the units on the vertical scale?

The percent of women 68 inches tall or taller is around _____.

The following is a block representing women at least 64 inches tall but less than 70 inches tall (whose heights are listed as 64, 65, 66, 67, 68, or 69 inches):



What is the right endpoint?

What is the height of the block?

What does that height represent? (Consider the units of the vertical scale.)

About what percent of the women have heights in the intervals labeled 64 through 69?

Are there more women with height 67 inches or height 68–69 inches?

Which of the two intervals is more crowded? Give a numerical value of the density for each.

Where is the most crowded inch of all?

The population of Chelsea is 35,000 and its area is 2.2 square miles; while the population of Alaska is 650,000 and its area is 650,000 square miles. Which has more people? Which has the greater population density? (That is: Which is more crowded?)