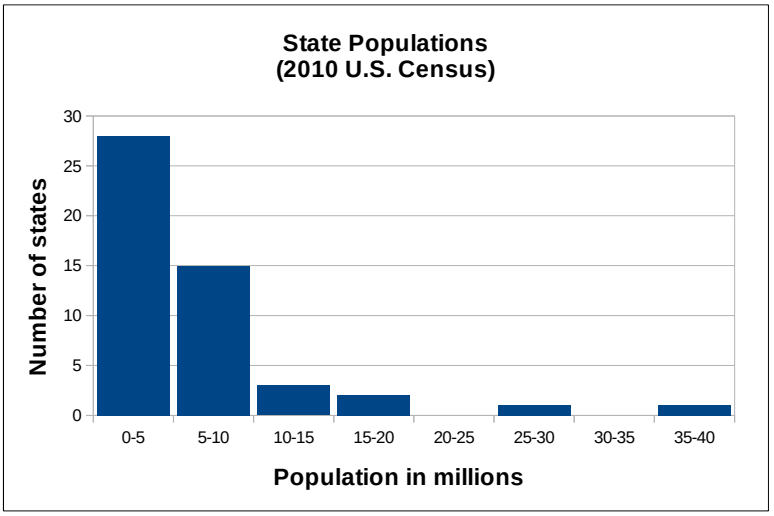

Figure 6.42. State populations

epopulations}

(b) Fill in the column showing the percent increase in cost of each of the ingredients.

I did that in column D.

(c) Find the cost of a pound of taco filling in 2013 and 2014. Then find the percent increase in the cost of the filling.

Column G (H) has the 2013 (2014) cost of $3.13 ($3.56). Increase is 13.9%.

(d) One way for Mr. Reyes to reduce the cost increase would be to change the percentages of meat and cheese, keeping the lettuce and tomato the same. What would the percent of each be if he wanted to keep the increase in a pound of filling to just 10%?

I played with the meat percent in cell I7, adjusting cheese percent in I9 automatically, until J12 was about 1.1. The answer: 54% meat instead of 45%, 11% cheese instead of 20%.

(e) Do you think customers would notice if Mr. Reyes changed the recipe using your answer to (d)?

I think they'd notice that there's only about half as much cheese. I think they would rather pay a little more for their favorite taco.

Exercise 6.12.34. [S] State populations.

Figure **??** shows the U. S. population distribution among the 50 states based on the 2010 U.S Census. The data are in StatePopulations2010.xlsx .

(a) Recreate the histogram in Excel.

(b) What is the modal population of states?

(c) Estimate the median population of states from the histogram. Compare that to the median population Excel calculates.

(d) Estimate the mean population of states from the histogram. Compare that to the mean population Excel calculates.

(a) Recreate the histogram in Excel.

See `../Answers/StatePopulations2010Solution.xlsx` .

(b) What is the modal population of states?

The highest bar is the first one, counting states with fewer than 5 million people, so the modal population is 0-6 million. I'd count 2.5 million as a correct answer.

(c) Estimate the median population of states from the histogram. Compare that to the median population Excel calculates.

There are fifty states so the median population is the 25th in size. There are 28 states with a population less than 5 million, so I will estimate that the 25th has population about 4.5 million.

Excel says the median is 4436369.5 million, so my estimate is pretty good.

(d) Estimate the mean population of states from the histogram. Compare that to the mean population Excel calculates.

I used the midpoint of each 5 million range as the typical population for the states in that range and calculated the weighted average (with Excel). The result was 6.4 million. The `AVERAGE` function found the true mean to be 6.16 million. That's an error of just about 4%.

Review exercises.

Exercise 6.12.35. [A] [R][Section **??**][Goal **??**][Goal **??**]

Create an Excel spreadsheet and put the following numbers in the first column.

14 15 22 50 0 33 16 18 23 40 47

(a) Use Excel to find the mean, median and mode of these numbers

(b) Change the first number from 14 to 23. How do the Excel calculations change?

(c) Click the "undo" button and confirm that Excel reverts back to the original set of numbers.

(d) Change the last four numbers to 0 (so that the data now read

14 15 22 50 0 33 16 0 0 0 0

How do the different averages change? Explain how the data are skewed.