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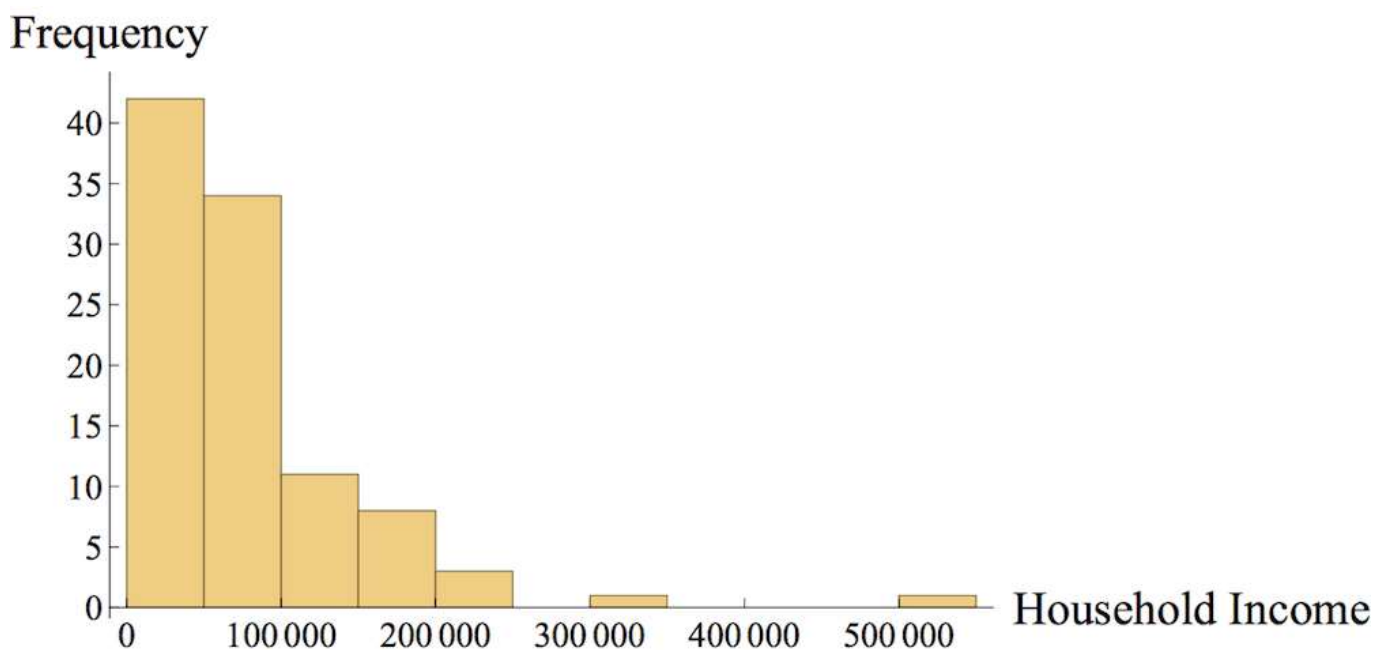
1.1.3 Exploratory Quiz: How To Make A Histogram

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Question 1

1.0/1.0 point (graded)

Here is the histogram for the small example of 100 households. What is the approximate bin size? In other words, what is the range of the intervals which the data are sorted into?



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[Image Description](#)

- ☐ 10 dollars per year
- ☐ 50 dollars per year
- ☐ 1,000 dollars per year
- ☐ 5,000 dollars per year

☐ 10,000 dollars per year☒ 50,000 dollars per year ✓☐ 100,000 dollars per year**Explanation**

We can see from the histogram that the bins are equal sized. There are 2 bins between the incomes of \$0/year and \$100,000/year, so when we divide a range of \$100,000/year into two equal parts, each part has range \$50,000/year.

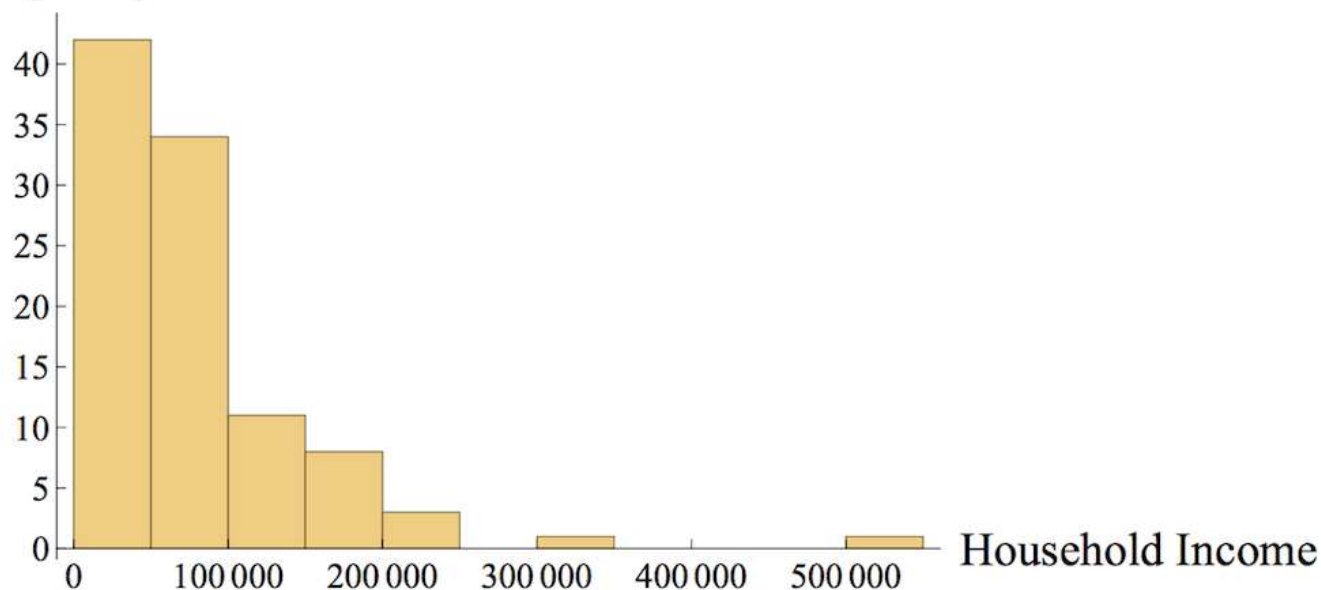
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Question 2

1.0/1.0 point (graded)

The histogram below displays data from the small sample of 100 household incomes. According to the histogram, about what percentage of the sample has income less than \$50,000/year?

Frequency[View Larger Image](#)[Image Description](#)☐ 1%

☐ 4%☐ 10%☐ 35%☒ 40% ✓☐ 50,000%☐ 100,000%**Explanation**

The height of the bar which starts at \$0/year and ends at \$50,000/year is a little more than 40. The histogram displays information on 100 households total. The percentage is about 40/100 or 40%.

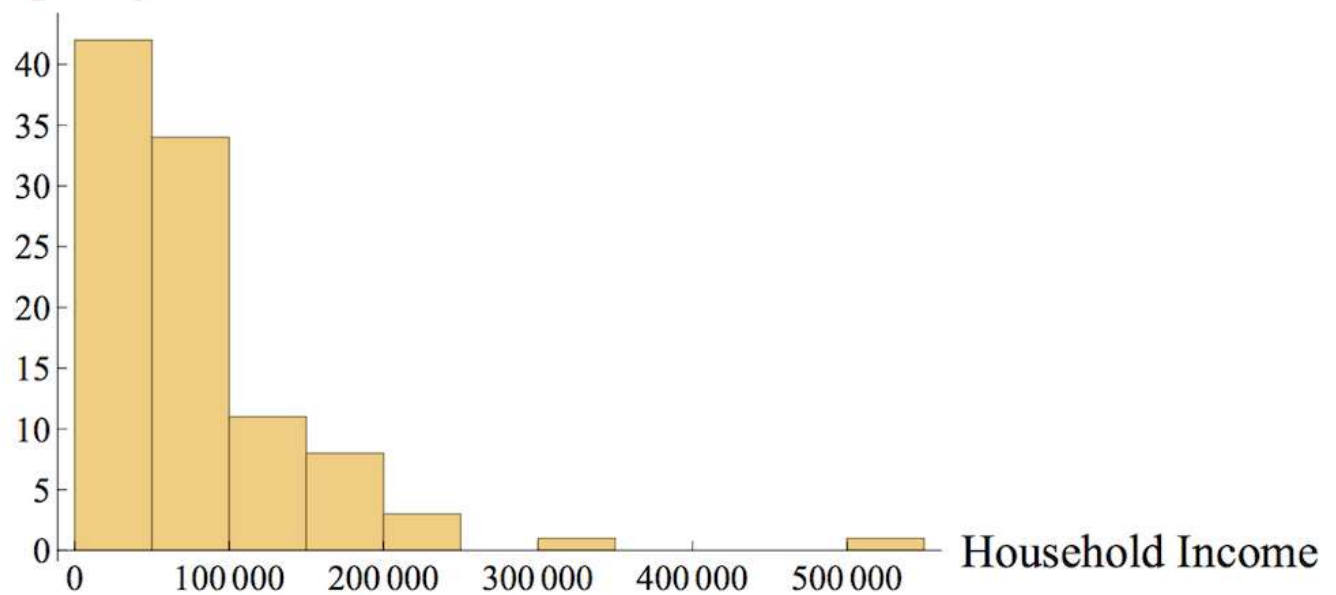
i Answers are displayed within the problem

Question 3

1.0/1.0 point (graded)

The histogram below again displays the small sample of 100 annual incomes. According to the histogram, what percentage of the sample has income between \$100,000 and \$150,000 per year?

Frequency



View Larger Image
Image Description

☐ 1%

☐ 4%

☒ 10% ✓

☐ 35%

☐ 40%

☐ 50,000%

☐ 100,000%

Explanation

The height of the bar which starts at \$100,000/year and ends at \$150,000/year is a little more than 10. The histogram displays information on 100 households total. The percentage is about 10/100 or 10%.

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Question 4: Think About It...

1/1 point (graded)

Intervals of \$50,000 per year may not give as much information as we'd like. For instance, you cannot see from the histogram how many households in this sample are below the federal poverty level (which is about \$12,000/year for a single person household.) You also can't see that there is an interesting cluster of household incomes just below \$200,000 per year.

Use the **Desmos graph*** (opens in a new window/tab) to explore different bin sizes. The slider *w* represents the bin width. It starts at \$50,000/year. You can increase or decrease it.

Then record your impressions of how the graph changes with bin size.

* Review the notes on Using Desmos in this course from Section 0 if needed.

If the bin size is too small, there are too many bins. If too large there are only a few bins.



Thank you for your response.

Explanation

For bin sizes between \$10,000/year and \$50,000/year we can see at a glance which ranges are represented with higher frequency; this helps us interpret and describe the data.

For example, we can see that households below \$50,000/year are not uniformly distributed: there are more people making between \$10,000/year and \$20,000/year than below \$10,000.

As mentioned above, there may be tradeoffs between making trends visible and having convenient or interesting bin sizes.

When bin size is very small, the frequency of each bin is close to 0 and it becomes difficult to see patterns in the data. Similarly, when bin size is very large there are so few bins that any patterns in the data are again obscured. For example, if you use a bin size of \$550,000/year, you'll see one bar at height 100, since all 100 households in this small sample make less than \$550,000/year.

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i Answers are displayed within the problem

Question 5: Think About It...

1/1 point (graded)

What do you think is the most useful bin length for these data? Enter a number. (There is no one right answer.)

✓ Answer: 1000000000000000

Explanation

This is discussed in the next video. (Note: For purposes of grading automation, edX shows the "correct" answer as "1000000000000000", but there is no right or wrong answer to this reflective question. Answers will be accepted in the range from 0 - 1000000000000000.)

i Answers are displayed within the problem

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