

8.7 Getting Schooled

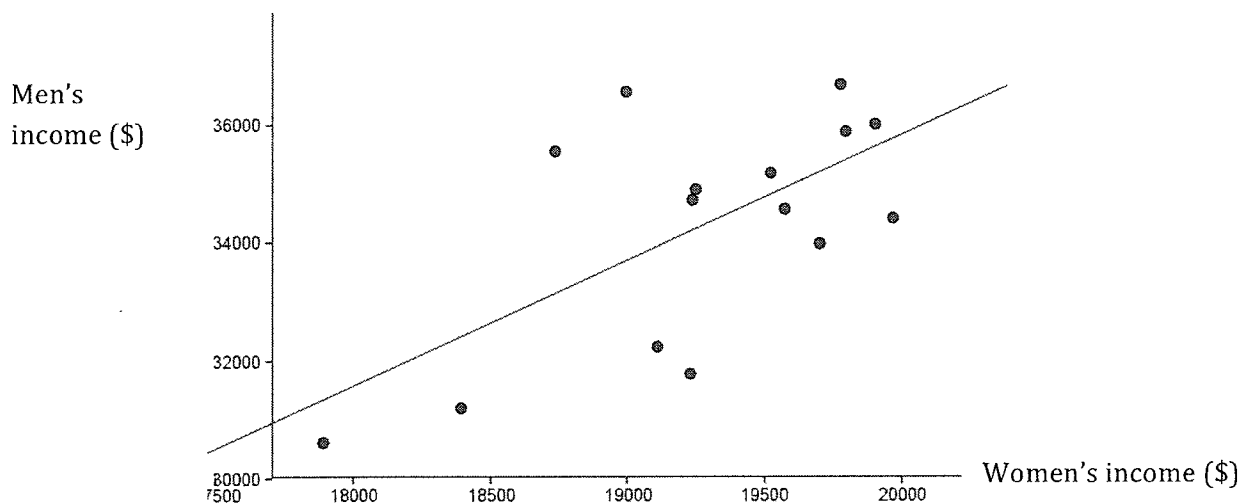
A Solidify Understanding Task



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In *Getting More \$*, Leo and Araceli noticed a difference in men's and women's salaries. Araceli thought that it was unfair that women were paid less than men. Leo thought that there must be some good reason for the discrepancy, so they decided to dig deeper into the Census Bureau's income data to see if they could understand more about these differences.

First, they decided to compare the income of men and women that graduated from high school (or equivalent), but did not pursue further schooling. They created the scatter plot below, with the x value of a point representing the average woman's salary for some year and the y value representing the average man's salary for the same year. For instance, the year 2011 is represented on the graph by the point (17887, 30616). You can find this point on the graph in the bottom left corner.



1. Based upon the graph, estimate the correlation coefficient.
2. Estimate the average income for men in this time period. Describe how you used the graph to find it.
3. What is the average income for women in this time period? Describe how you used the graph to find it.

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4. Leo and Araceli calculated the linear regression for these data to be $y = 2.189x - 6731.8$. What does the slope of this regression line mean about the income of men compared to women? Use precise units and language.

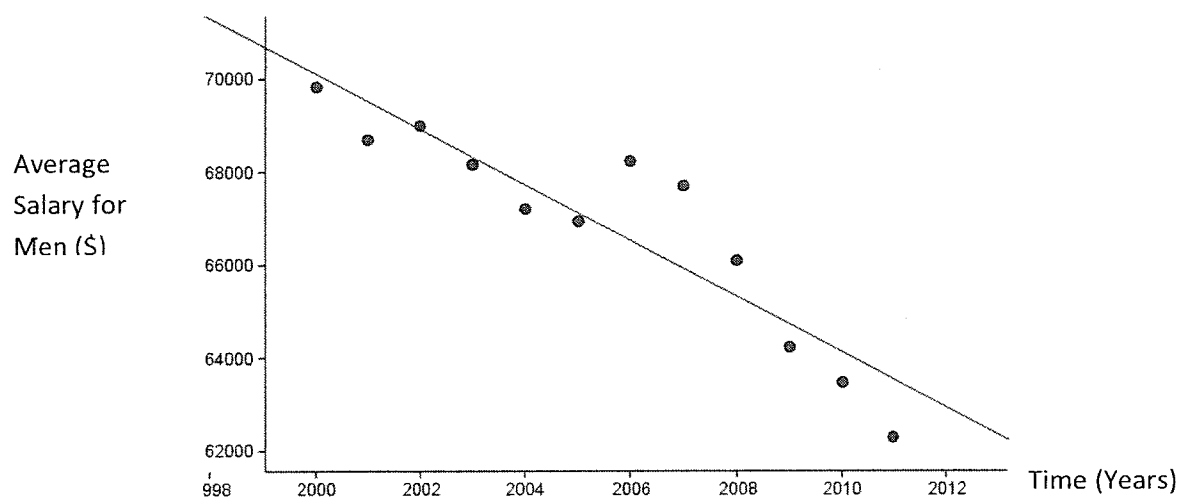
“Hmmm,” said Araceli, “It’s just as I suspected. The whole system is unfair to women.” “No, wait,” said Leo, “Let’s look at incomes for men and women with bachelor’s degrees or more. Maybe it has something to do with levels of education.”

5. Leo and Araceli started with the data for men with bachelor’s degrees or more. They found the correlation coefficient for the average salary vs year from 2000-2011 was $r = -.9145$.

Predict what the graph might look like and draw it here. Be sure to scale and label the axes and put 12 points on your graph.



The actual scatter plot for salaries for men with bachelor's degrees from 2000-2011 is below. How did you do?



- Both Leo and Araceli were surprised at this graph. They calculated the regression line and got $y = -598.25x + 1266626.34$. What does this equation say about the income of men with bachelor's degrees from 2000-2011?
- Leo wondered why the y-intercept in the equation was \$1,266,626.34 and yet the graph seems to cross the y axis around \$72,000. What would you tell Leo to resolve his concern?

Next, they turned their attention to the data for women with bachelor's degrees or more from 2000-2011. Here's the data:

Year	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Income for Women (\$)	41338	42409	42746	42620	44161	44007	42690	42539	42954	42871	42992	43293

Analyze these data by creating a scatter plot, interpreting the correlation coefficient and the regression line. Draw the graph and report the results of your analysis below:

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Now that you have analyzed the results for women, compare the results for men and women with bachelor's degrees and more over the period from 2000-2011.

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Leo believes that the difference in income between men and women may be explained by differences in education, but Araceli believes there must be other factors such as discrimination. Based on the data in this task and *Getting More \$*, make a convincing case to support either Leo or Araceli.

What other data that would be useful in making your case? Explain what you would look for and why.