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IB Math Studies

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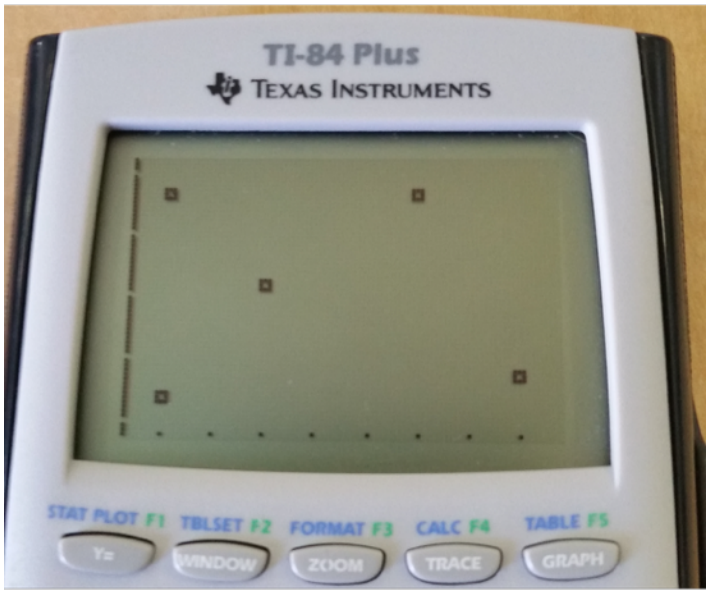
Linear Regression Study

My question was this: How well does height predict weight? I split the data into two groups: men and women.

Women

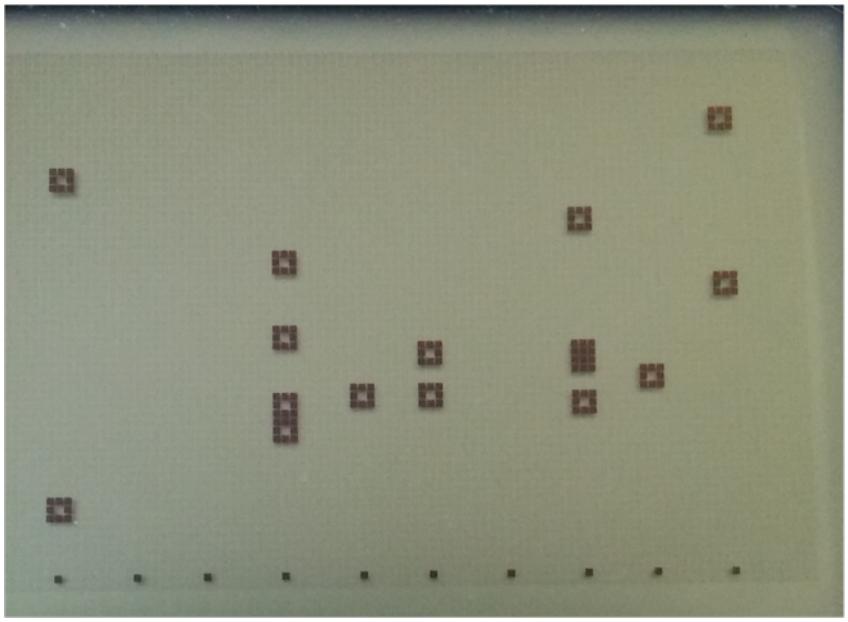


Height (in.)	Weight (lbs.)
61	140
63	120
68	102
66	140
63	97

The r value is -.1. The line of best fit is approximately Y=-.7x+167.2.
The r value was very close to zero, meaning the correlation between height and weight with women is super weak. In other words, women's heights are not good predictors of their weights.

The slope of the line of best fit is -.7. This means that for every inch gained on the x axis, there is .7 pounds lost. This isn't an accurate representation of the overall population. My data was skewed!

Men



Height (in.)	Weight (lbs.)
68	135
71	134
73	223
72	142
64	101
73	170
69	150
67	125
67	155
76	205
67	179

69	136
67	132
71	190
71	150
71	145

The r value for the men was .222. This is stronger than the women's, but it's still pretty weak. The line of best fit was y=2.5x-11.62. The slope was 2.5. This means that the average man gains about two and a half pounds for every inch he grows.

The results of the investigation would look much different with a larger sample size. The y intercepts would likely move closer to the origins. The slope of the women's line would probably become positive. It doesn't make sense that taller women would weigh less than shorter ones. The slope of the men's line would probably get bigger as well. A negative y intercept doesn't make any sense here.