

Homework 13

Due Friday, Dec. 4

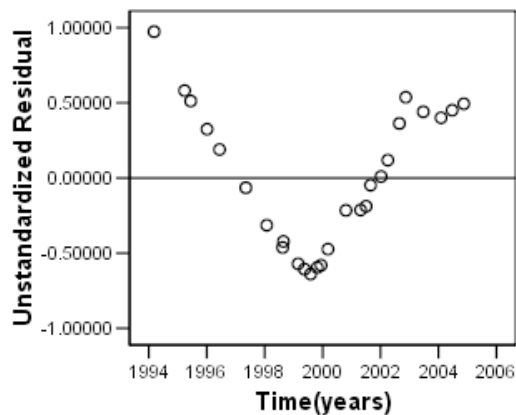
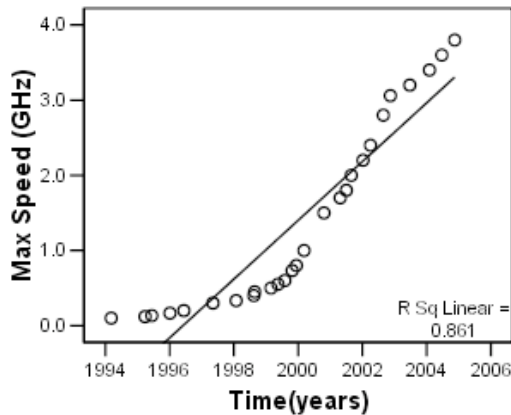
WMMY: Ch 11 # 3, 7, 13, 31, 49, 63a, 68

Problem A: The mean height of American women in their twenties is about 64 inches, and the standard deviation is about 2.7 inches. For men the same age, the mean is 69.3 with an SD of 2.8. If the correlation between the heights of husbands and wives is about $r = 0.5$, what is the slope of the regression line of the husband's height on the wife's height? Draw a graph of this regression line. Predict the height of the husband of a woman who is 67 inches tall.

Problem B: Which of these pairs of variables are likely to have positive association, and which are likely to have negative association? For each pair, which is naturally the dependent variable, and which is the independent variable?

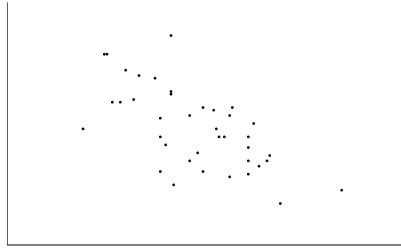
	Variable 1	Variable 2
i	Altitude in feet.	Amount of oxygen in the air, in mmHg.
ii	Inches of rain in the growing season.	Corn yield in bushels.
iii	Muzzle velocity of a bullet.	Bullet penetration depth into a gelatin block.
iv	Fuel impurity levels, in parts per million.	Engine efficiency (in percent).
v	Daily cut flower sales, in tons.	Daily sales of Hallmark brand cards, in thousands.

Problem C: The plots below show the top speed (in GHz) of Intel 32-bit processors since 1994. The left plot shows the least-squares regression line, and the right plot shows the residuals.

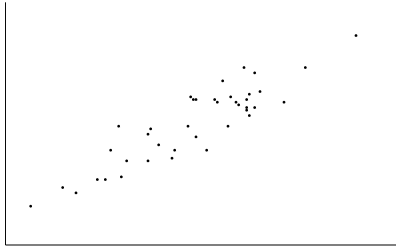


- i. Explain the meaning of $R^2 = 0.861$ for the line.
- ii. Looking at both graphs, do you think the line is a good fit for the data?

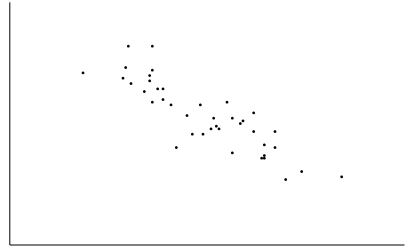
Problem D: The scatterplots below have correlation coefficients $r = .9$, $r = .5$, $r = 0$, $r = -.5$, and $r = -.9$. Decide which is which, and draw (as best you can) the regression line on the plot. (You can make a rough copy of the plot onto your answer page, or hand in this page.)



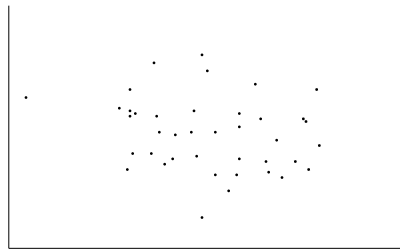
i



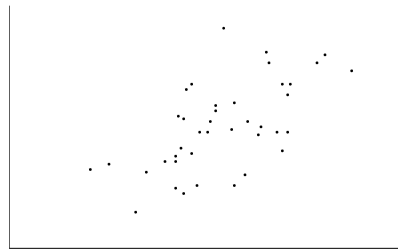
ii



iii



iv



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