

Statistics 528 - HW3 Solutions

2.1

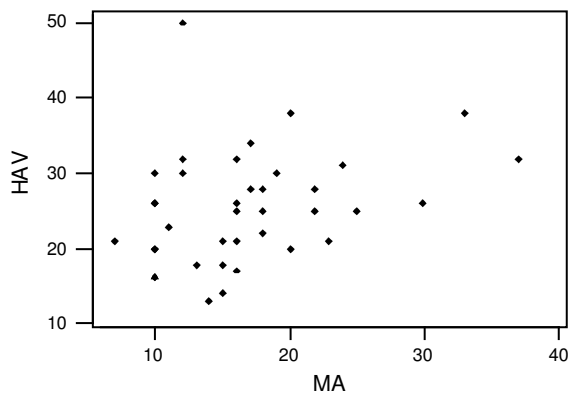
- (a) Grade would be response and time of study would be explanatory.
- (b) Relationship.
- (c) Rain would be explanatory and yield would be response.
- (d) Relationship.
- (e) Income would be explanatory and education would be response.

2.4

- (a) Stock returns range from -30% to +50%. Treasury bills range from about 1% to 15%.
- (b) At a glance you might see a very weak negative association between interest rates and returns on stocks. A closer look gives that there is no apparent pattern. Stocks show returns between -10% and 30% for all interest rates between 1% and 10%.

2.8

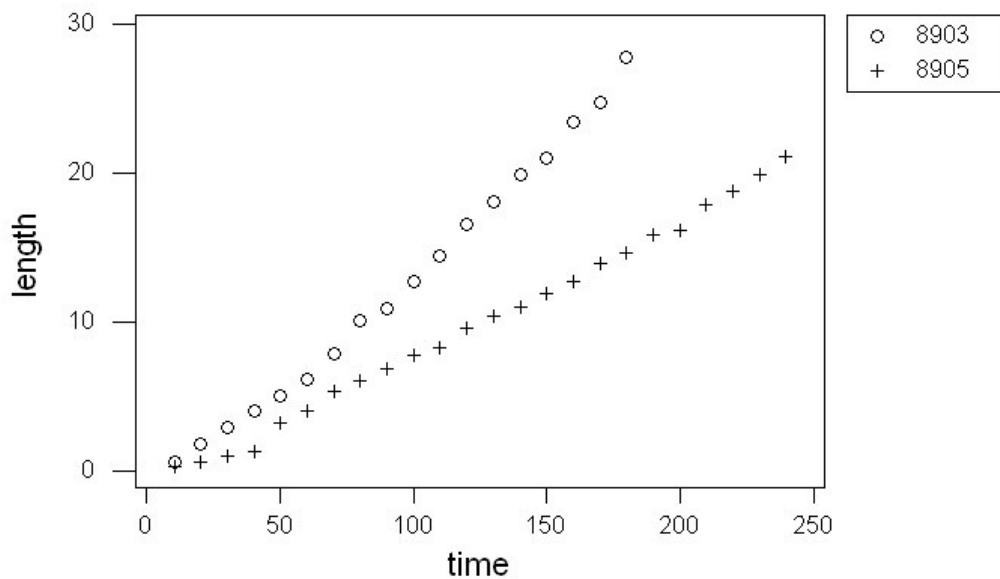
- (a) Plot below. MA is explanatory because we are using it to predict HAV.



- (b) The relationship is fairly linear with positive slope. The strength is moderate. There is one outlier with the highest value of HAV.
- (c) MA can be used to predict HAV, but not very precisely.

2.12

- (a)



(b) There is a fairly strong positive correlation between Length and Time for both 8905 and 8903. The relationship of 8903 is linear with a higher slope than that of 8905. But the range of 8905 is beyond that of 8903, so we couldn't compare the two runs in the range between 180min-240min.

2.20

(a) See plot in 2.11. Correlation for women should be higher than for men because the values for women are closer to a straight line.

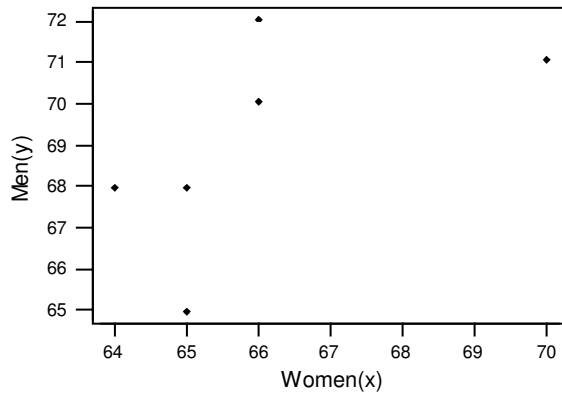
(b) For women, $r=0.876$. For men, $r=0.592$.

(c) The mean for women is 43.03 and the mean for men is 53.1. This does not affect the correlation. Correlation is unaffected by changes in location.

(d) Correlation is not affected by the units in the problem.

2.21

(a) Plot below. Correlation is probably positive, but not large.



(b) $r=0.565$

(c) Correlation is unaffected by shifts in data. Correlation does not help answer the question of whether the men are taller. It could answer the question “Do taller women date taller men?”

(d) Correlation is not changed by changing the unit.

(e) In that case, all the data points fall exactly on a straight line, thus the correlation is 1.

2.34

(a) Correlation cannot be applied to gender. It is only for two quantitative variables.

(b) Correlation cannot be greater than 1. It is always between -1 and 1.

(c) Correlation does not have units.