MATH 1342

Homework 6 (Sections 5.1 – 5.3)

Instructions: Answer all questions through the EMCF tab of casa under the assignment named "Homework 6" before the deadline.

There is no "Submit" button. Your answers will be automatically submitted once the deadline arrives.

Assignments will be graded out of 20 points.

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1. Section 5.1; Problem 2

   A. Explanatory: Grade Earned; Response: Study Time

   B. Explanatory: Study Time; Response: Grade Earned

   C. Cannot be determined

2. Section 5.1; Problem 8 (Explain how this relates to causality)

   A. Positive Trend. An increase in the explanatory variable caused an increase response variable.

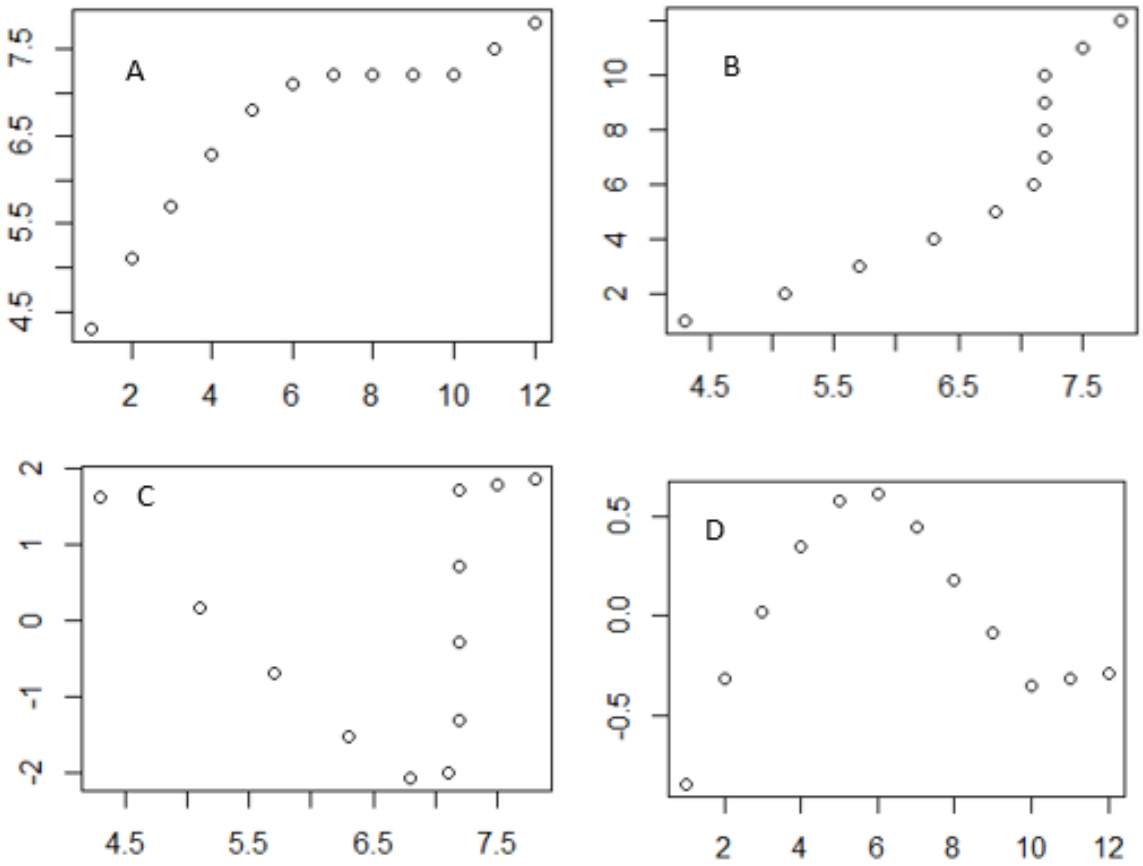
   B. Positive Trend. As the explanatory variable increased so did the response variable.

   C. Negative Trend. An increase in the explanatory variable caused a decrease in the response variable.

   D. Negative Trend. As the explanatory variable increased the response variable decreased.

   E. No trend.

3. Section 5.1; Problem 10 (a)



E. None of the above options.

4. Section 5.1; Problem 10 (b, c)

A. There is a positive linear trend between the two variables.

B. There is a negative linear trend between the two variables.

C. There is a positive non-linear trend between the two variables.

D. There is a negative non-linear trend between the two variables.

E. There is no trend between the variables.

5. Section 5.1; Problem 10 (d)

A. Yes. By following the pattern presented, we can determine an approximate weight for an age of 25 months.

B. No. Due to the fact that the graph is non-linear, it is impossible to estimate values not provided in the table of data.

C. No. Due to the fact that there were less than 30 data points in the presented data, estimating additional values would not be efficient.

D. No. Since the value in question (x = 25 months) is so far from our known data points (x = 1 to 12), we cannot make estimates with any certainty.

E. The accuracy of any estimates cannot be determined with the information provided.

6. Section 5.2; Problem 2 (correlation coefficient value)

A. -0.9875 B. -0.6773 C. 0.0032 D. 0.6773 E. 0.9875

7. Section 5.2; Problem 2 (correlation coefficient interpretation)

A. There is a strong positive relationship between the variables.

B. There is a weak positive relationship between the variables.

C. There is a strong negative relationship between the variables.

D. There is a weak negative relationship between the variables.

E. There is no relationship between the variables.

8. Section 5.2; Problem 4

A. -0.98 B. -0.85 C. 0.42 D. 0.85 E. 0.98

9. Section 5.2; Problem 6

A. -0.98 B. -0.85 C. -0.42 D. 0.85 E. 0.98

10. Section 5.3; Problem (a) 2; (b) 4; (c) 6; (d) 7; e (10)

A. (a) T; (b) T; (c) F; (d) T; (e) F

B. (a) F; (b) F; (c) T; (d) T; (e) F

C. (a) T; (b) T; (c) T; (d) T; (e) T

D. (a) T; (b) F; (c) F; (d) T; (e) F

E. (a) F; (b) F; (c) F; (d) T; (e) F

11. Section 5.3; Problem 11

A. $\hat{y} = 2.405x - 24.175$ B. $\hat{y} = 2.405x - 1.661$

C. $\hat{y} = 0.403x + 14.873$ D. $\hat{y} = 0.856x + 0.403$

E. $\hat{y} = 0.403x + 0.856$

12. Section 5.3; Problem 16

A. There is an increase of 3.41 chirps per minute for every one degree increase of temperature.

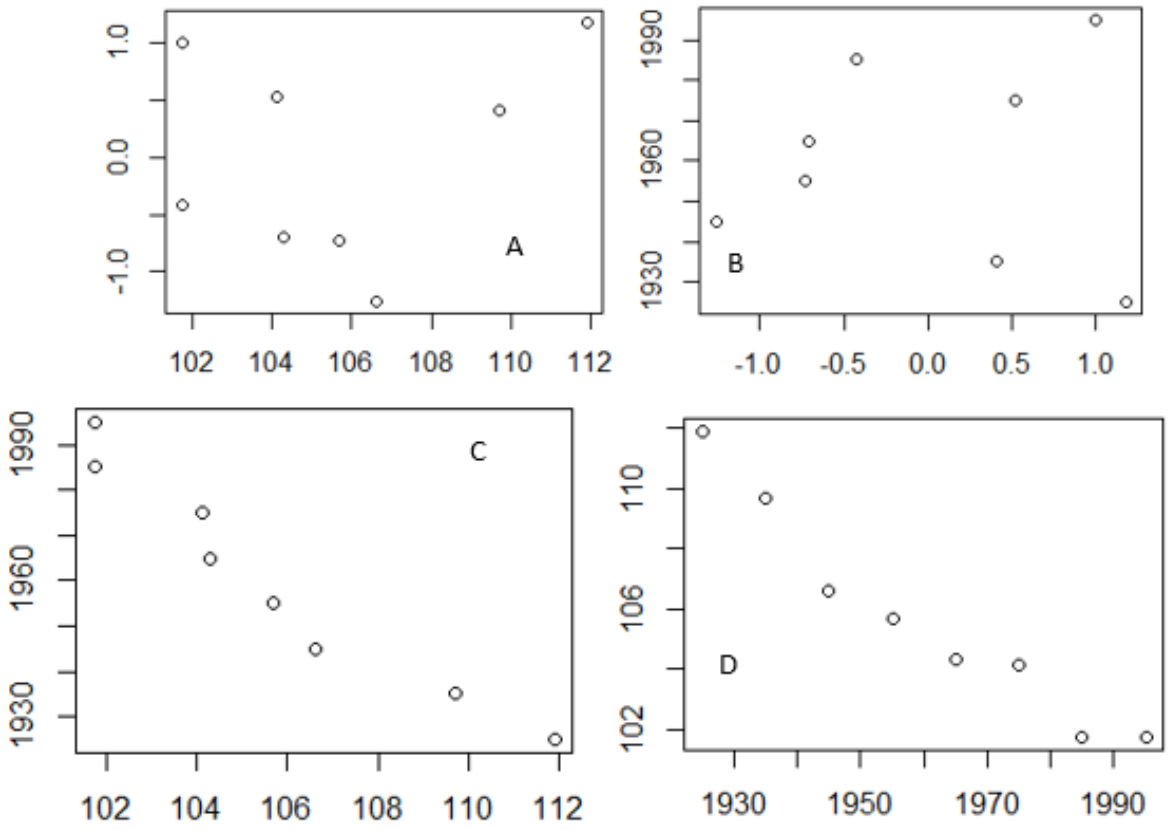
B. There is an increase of 1 chirp per minute for every 3.41 degree increase in temperature.

C. There is an increase of 3.41 chirps per minute for every 50 degree increase in temperature.

D. There is an increase of 10.53 chirps per minute for every one degree increase in temperature.

E. There is an increase of 10.53 chirps per minute for every 3.41 degree increase in temperature.

13. Section 5.3; Problem 18 (a)



E. None of the above options

14. Section 5.3; Problem 18 (b)

A. $\hat{y} = 385.58x - 0.1428$

B. $\hat{y} = -0.1428x + 385.58$

C. $\hat{y} = -6.569x + 2654.504$

D. $\hat{y} = -12.65x + 665.7$

E. $\hat{y} = 0.1428x - 385.58$

15. Section 5.3; Problem 18 (c)

A. There is an increase of 0.1428 seconds of world record 800 meter run-times for every year elapsed.

B. There is an increase of 0.1428 seconds of world record 800 meter run-times for 385 years elapsed.

C. The increase of one year causes the world record 800 meter run-time to decrease by 0.1428 seconds.

D. There is a decrease of 0.1428 seconds of world record 800 meter run-times for every year elapsed.

E. There is a decrease of 0.1428 seconds of world record 800 meter run-times for every 385 years elapsed.

16. Section 5.3; Problem 18 (d) (r value)

A. -0.1428 B. -0.9685 C. 0.0204

D. 0.9380 E. 385.58

17. Section 5.3; Problem 18 (d) (r interpretation)

A. There is a strong positive relationship between the variables.

B. There is a strong negative relationship between the variables.

C. There is a weak positive relationship between the variables.

D. There is a weak negative relationship between the variables.

E. There is no relationship between the variables.

18. Section 5.3; Problem 18 (e) (r^2 value)

A. 0.0204 B. 19.636 C. 0.9841

D. 0.9380 E. 0.1428

19. Section 5.3; Problem 18 (e) (r^2 interpretation)

A. Roughly, 98% of the variation in world record times is explained by the Least Square Regression Line.

B. This shows that there is a strong, positive relationship between the passage of time and the variation in world record times.

C. Roughly, 93% of the variation in world record times is explained by the Least Square Regression Line.

D. We can say, with 93% certainty, that the passage of years causes the change in the world record times.

E. We can say, with 98% certainty, that the decreasing world record times is caused by the unidirectional progression of years.

20. For a set of data: x = (0,1,2,3,4,5,6) and y = (36, 28, 25, 24, 23, 21, 19), determine and interpret the correlation coefficient.

Proposed Solution:

assign("x", c(0,1,2,3,4,5,6))

assign("y",c(36, 28, 25, 24, 23, 21, 19))

cor(x,y) = -0.92638

Interpretation: This means that an increase of x causes a decrease in y.

What was done wrong in the proposed solution?

A. The correlation coefficient is calculated by cor(x,y)^2.

B. The correlation coefficient is calculated by sqrt(cor(x,y)).

C. The correlation coefficient is calculated correctly, but the interpretation should indicate that an increase of x caused an increase in y.

D. The correlation coefficient is calculated correctly, but the interpretation should only indicate that there is a negative trend between x and y.

E. The proposed solution is correct.