

MATH 11: Discussion Week 10

June, 2019

The handouts and solution could be found at <https://kimukook.github.io/teaching/math11sp19/>

χ^2 **for goodness-of-fit** 1. In a certain genetics experiment, Mendel's theory predicts that 50 percent of snapdragon plants produced will be pink, 25 percent will be white, and 25 percent will be red. Suppose that, among 200 plants produced, we see that 94 are pink, 57 are white, and 49 are red. How well do these observations support the theory? Answer the question by conducting an appropriate hypothesis test. Carefully state your conclusion. (*Hint: The probability for χ^2 statistic bigger than 1.36 is 0.2533 with degree of freedom 2*)

Regression analysis 2. The body temperatures (in degrees Fahrenheit) and heart rates (in beats per minute) of 130 people were recorded. We are interested in investigating the relationship between heart rate and body temperature, and in predicting the heart rate of someone whose body temperature is 98.0. Below is regression output from MINITAB along with some relevant graphs.

Regression Analysis: HeartRate versus BodyTemp

The regression equation is

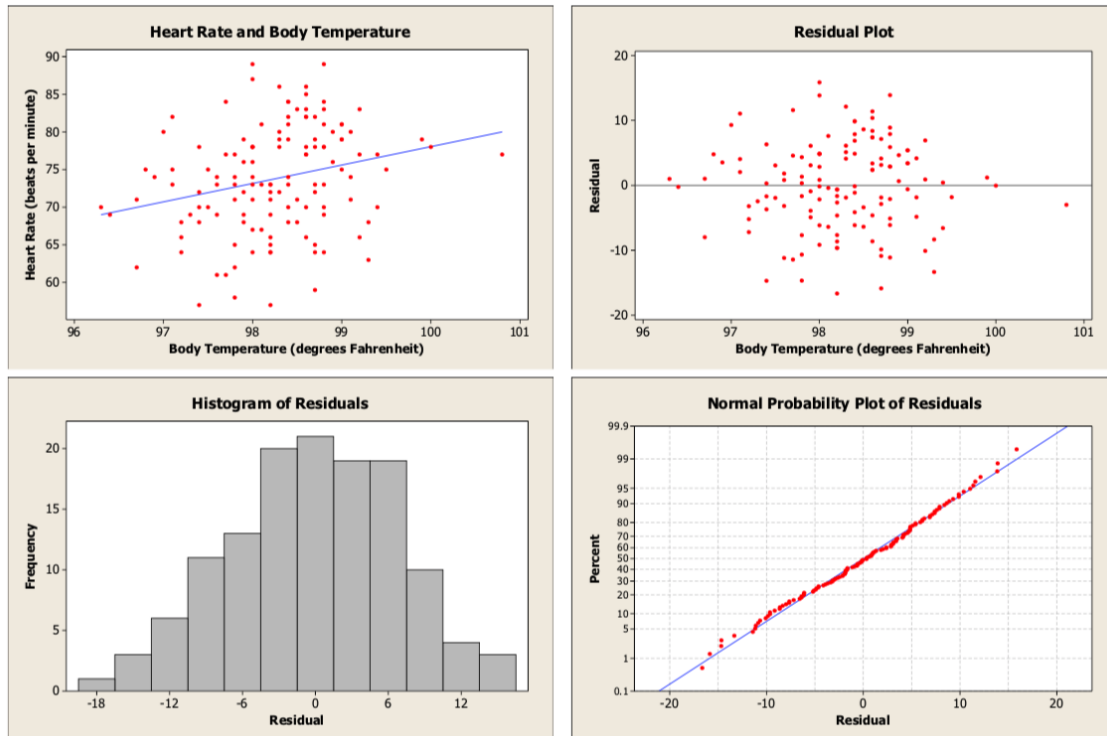
$$\text{HeartRate} = -166.28 + 2.44\text{BodyTemp}$$

Predictor	Coef	SE Coef	T	P
Constant	-166.28	80.91	-2.06	0.042
BodyTemp.	2.4432	0.8235	2.97	0.004

S = 6.85774 R-sq = 6.4%

Predicted values for New Observations

New Obs	Fit	SE Fit	95% CI	95% PI
1.	73.153	0.636	(71.895, 74.410)	(59.525, 86.780)



- a) Are the assumptions for regression inference satisfied? Explain your answer.
- b) What percentage of the variation in heart rate can be explained by differences in body temperature?
- c) Is there strong evidence of an association between heart rate and body temperature? Explain your answer. Use significance level 0.05.
- d) Find a 95 percent confidence interval for the slope of the true regression line. (*Hint: $t_{128}^* = 1.98$ for 95% CI*)
- e) Find an interval which you are 95 percent confident will contain the heart rate of a person whose body temperature is 98.0.