

## Final Exam – Take Home

### First Year College Student Nutrition Study

The data for your project comes from a nutritional study conducted at Youngstown State University during 1997-1998. Forty four subjects completed the study in which body measurements and nutrition data was collected at the beginning of the Fall semester and then again in the Spring semester. A portion of that data appears in the data file **nutri5a.xls** which is available at <http://csuohio.edu/holcombj/mth147/finalexam.htm>

Variable guide:

studynum	An identifying number to keep track of subjects
gender	0=male, 1=female
residenc	0=on-campus, 1=off-campus
athlete	0=non-athlete, 1=athlete
perfatf	Percent Fat in Diet Fall
fat30f	0=no, 1=yes for over 30% Fat in Diet in Fall
perprof	Percent Protein in Diet for Fall
percarbof	Percent Carbohydrates in Diet for Fall
persweetf	Percent Sweets in Diet for Fall
sweets10f	0=no, 1=yes for over 10% Sweets in Diet in Fall
peralcf	Percent Alcohol in Diet in Fall
weightf	Weight in kg in Fall

The main purpose of the study was to examine weight and nutrition characteristics in the college first year population. The study examined the percents of calories made up of fat, protein and carbohydrates. Then they broke the carbohydrate group down further into the percent of total calories from sweets and alcohol.

For the following tests of Hypothesis, be sure to state the hypotheses, the test statistic, the P-value or the P-value estimate, and your conclusion. Assume that the subjects are a random sample of first year students.

1. Is there sufficient evidence to conclude that the mean percent of protein is greater than 10% (**perprof**) is greater than 10%? (Perform a test of means)
2. Is there sufficient evidence to conclude that over 50% of first year students have fat percents over 30%? (Use a test of proportions on **fat30f**)?
3. Determine if **athlete** and **fat30f** (having over 30% of calories come from fat) are independent.

4. Create a scatterplot of **perfatf** predicting **weightf**. Do you think **perfatf** is useful in predicting **weightf**? Perform a formal test of hypotheses. What is your conclusion?
5. Create a scatterplot of **persweetf** predicting **weightf**. Do you think **persweetf** is useful in predicting **weightf**? Perform a formal test of hypotheses. What is your conclusion?

Write a paragraph that describes your conclusions. Also, perform some kind of a test of hypothesis that I have not proposed. This could be a test involving a mean, a proportion, independence, or it could involve a regression analysis. Clearly state your null, alternative, test statistic, P-value, and conclusion.

perprof

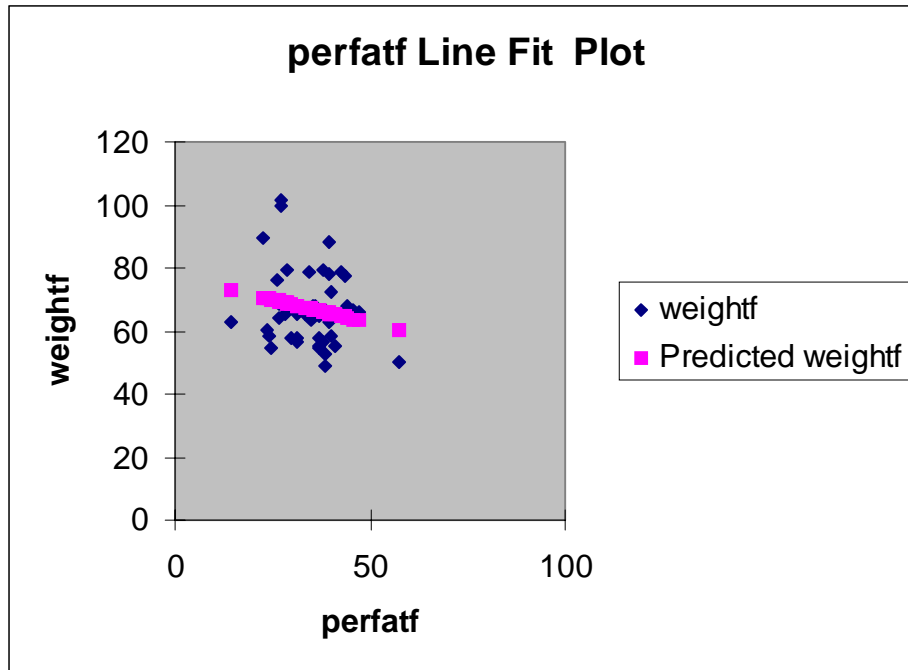
Mean 15.71591  
Standard Error 0.441108  
Median 15.35  
Mode 16.2  
Standard Deviation 2.925982  
Sample Variance 8.561369  
Kurtosis -0.19398  
Skewness 0.419273  
Range 13.1  
Minimum 9.1  
Maximum 22.2  
Sum 691.5  
Count 44

z 12.95806

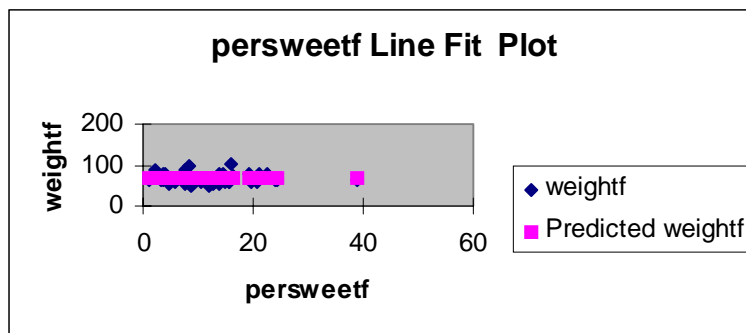
Sum of count	fat30f		
athlete	0	1	Grand Total
0	8	23	31
1	6	7	13
Grand Total	14	30	44

phat 0.68182  
z 2.41209  
pvalue 0.00793

Chi-Square 1.748  
df 1  
p-value 0.186



	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	77.44352	8.259646	9.37613	7.41E-12
perfatf	-0.29779	0.233478	-1.27546	0.209158



	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	67.56321	3.369249	20.0529	3.97E-23
persweetf	-0.03426	0.242018	-0.14158	0.888089