MET CS 555 Assignment 3 – 20 points

Spring , 2018

SUBMISSION REQUIREMENTS: Please submit a single document (word or PDF) for submission. Your submission should contain a summary of your results (and answers to questions asked on the homework) as well as your R code used to generate your results (please append to the end of your submission).

The data in this document gives the number of meals eaten that contain fish (per week) and mercury levels in head hair for 100 fisherman. Save the data to a format that can be read into R. Read the data in for analysis. Use R to calculate the quantities and generate the visual summaries requested below.

(1) Save the data to a file (excel or CSV file) and read it into R memory for analysis. (Q1 - 2 points)

(2) To get a sense of the data, generate a scatterplot (using an appropriate window, label the axes, and title the graph). Consciously decide which variable should be on the x -axis and which should be on the y-axis. Using the scatterplot, describe the form, direction, and strength of the association between the variables. (Q2 - 3 points)

(3) Calculate the correlation coefficient. What does the correlation tell us? (Q3 - 2 points)

(4) Find the equation of the least squares regression equation, and write out the equation. Add the regression line to the scatterplot you generated above. (Q4 - 4 points)

(5) What is the estimate for β_1 beta_1 ? How can we interpret this value? What is the estimate for β_0 beta_0 ? What is the interpretation of this value? (Q5 - 4 points)

(6) Calculate the ANOVA table and the table which gives the standard error of $\hat{\beta}_1$ (hat beta 1) . Formally test the hypothesis that beta_1 = 0 using either the F-test or the t-test at the alpha level a=0.10. Either way, present your results **using the 5 step procedure as in the course notes**. Within your conclusion, calculate the R^2 (R squared) value and interpret this.

Also, calculate and interpret the 90% confidence interval for beta_1 β_1 . (Q6 - 5 points)

Number of meals with fish	Total Mercury in mg/g
14	4.484
7	4.789
5	3.856
8	4.888
21	10.849
18	6.457
22	11.222
6	4.908
19	10.116
7	3.567
16	6.092
17	3.799
20	6.781
5	5.995
7	1.717
14	4.615
1	3.362
6	3.928
9	1.833
10	5.668
13	4.7
9	2.272
16	4.812
5	1.342
18	6.123
7	4.622
8	7.805
7	2.643
8	6.111
7	2.476
10	4.317
4	1.789
4	2.484
7	1.757
6	1.239
5	5.311
19	6.103
3	1.984
4	2.697
7	0.692

7	2.404
9	1.503
17	8.231
14	5.321
7	3.81
21	1.765
4	0.408
7	3.901
10	0.48
11	3.826
7	3.451
9	2.32
2	4.086
7	2.272
3	2.564
7	7.998
11	5.081
8	0.366
7	2.477
4	5.288
7	5.676
7	2.296
21	6.11
4	1.502
7	3.71
3	2.752
3	0.987
19	10.14
7	1.616
12	4.65
13	7.241
18	9.36
7	3.753
13	4.008
21	5.345
1	2.455
0	0.941
1	2.478
1	3.212
10	5.214
0	1.12
0	0.745
2	4.645

2	4.981
1	2.812
0	0.846
2	5.142
0	1.111
0	1.094
2	2.978
2	3.942
0	1.131
0	0.979
0	0.844
1	2.411
1	2.497
10	3.764
20	8.178
19	7.664
22	9.716