# Quiz 2. AMS 597

# Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_SBU ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# The quiz is due at the end of the lecture by 11:20am. Please email your completed quiz to your TA at: [song.jiecheng@stonybrook.edu](mailto:song.jiecheng@stonybrook.edu)

# Please include (1) R code

# (2) Output from R including all the plots

# (3) Answers to all the questions asked

The following table presents data collected in the 1960s for 21 countries on

X=Annual Per Capita Cigarette Consumption (“Cigarette”), and Y=Deaths from Coronary Heart Disease per 100,000 persons of age 35-64 (“Coronary”).

|  |  |  |
| --- | --- | --- |
| Country | Cigarette | Coronary |
| United States | 3900 | 259.9 |
| Canada | 3350 | 211.6 |
| Australia | 3220 | 238.1 |
| New Zealand | 3220 | 211.8 |
| United Kingdom | 2790 | 194.1 |
| Switzerland | 2780 | 124.5 |
| Ireland | 2770 | 187.3 |
| Iceland | 2290 | 110.5 |
| Finland | 2160 | 233.1 |
| West Germany | 1890 | 150.3 |
| Netherlands | 1810 | 124.7 |
| Greece | 1800 | 41.2 |
| Austria | 1770 | 182.1 |
| Belgium | 1700 | 118.1 |
| Mexico | 1680 | 31.9 |
| Italy | 1510 | 114.3 |
| Denmark | 1500 | 144.9 |
| France | 1410 | 144.9 |
| Sweden | 1270 | 126.9 |
| Spain | 1200 | 43.9 |
| Norway | 1090 | 136.3 |

1. Based on the scatterplot of Coronary versus Cigarette, does there appear to be a linear relationship between cigarette consumption and heart disease? If so, does the relationship appear to be negative or positive?
2. Please write down the equation for the fitted model.
3. Please compute the coefficient of determination, and also compute the correlation between the two variables Coronary and Cigarette. What is their relationship?
4. What patterns or problems, if any, do you see in the residuals versus fits plot? Would you feel reasonably comfortable in fitting a simple linear regression model to this data set?
5. Is there a positive linear relationship between Cigarette and Coronary at the 1% level of significance? Please discuss what assumptions you will need in order to conduct this test. Please test all related assumptions and report the results and conclusions.
6. Compute the residual for Greece.
7. Please plot the fitted regression line along with the fitted regression line.