Assignment 6

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Introduction

When we first saw the result from the article Chocolate Consumption, Cognitive Function, and Nobel Laureates, we suspected there is a confounding variable between these two variables(chocolate consumption and Nobel laureates) and we doubted that chocolate consumption is related to cognitive function. Like Ashutosh Jogalekar in the Scientific American mentioned

"*The paper starts by assuming - entirely reasonably - that winning a Nobel Prize must somehow be related to cognitive ability. It then goes on to describe a link between flavanols - organic molecules found among other foods in chocolate, green tea and red wine - and cognitive ability. Now I haven't read the literature on flavanols and cognitive ability, but I am sure that flavanols themselves couldn't possibly be responsible for improved cognitive effect, especially when they are part of a complex cocktail of dietary and environmental factors affecting brain function.*"

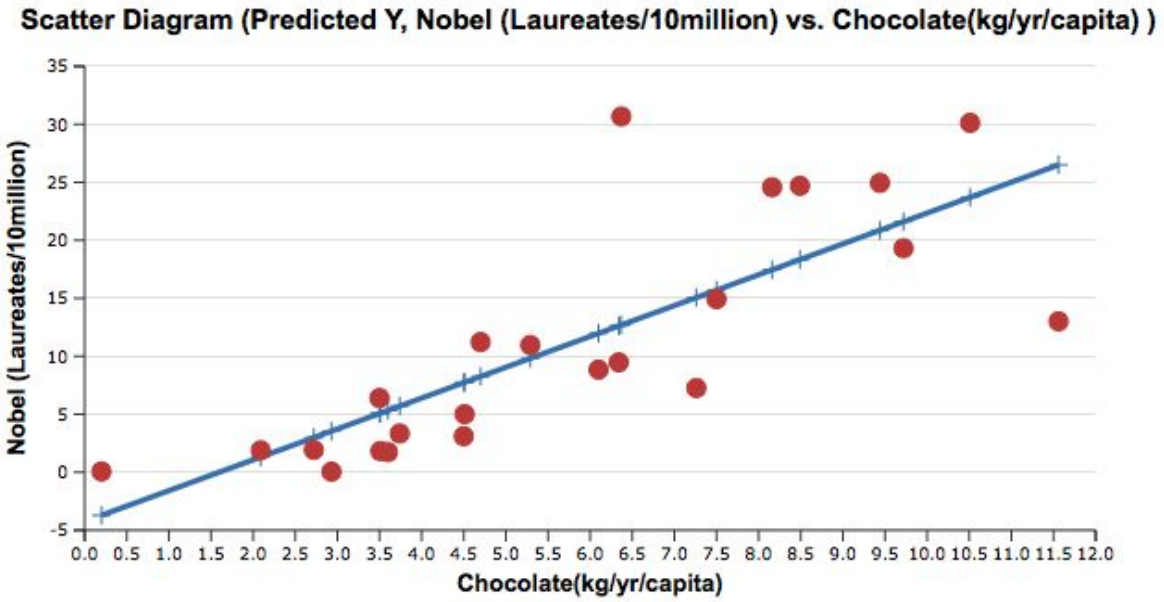
Thus, we found the GDP per capita of each correspondent countries. Besides that, we also want to see how tea and meat may have an influence on a number of Nobel laureate so we found the data of tea(kg/yr/capita) and meat(kg/yr/capita). We will use regression statistics to compare each variable and draw a regression diagram for each comparison.

Data

Nation	Chocolate (kg/yr/capita)	Tea(kg/yr/capita)	Meat(kg/yr/capita)	Nobel (Laureates/10million)	GDP per capita (US dollars)
Australia	4.51	0.54	111.72	5.006	51642
Austria	8.16	0.21	107.71	24.577	43547
Belgium	6.1	0.2	81.28	8.85	40456
Brazil	2.93	1.99	79.99	0.048	8802
Canada	3.5	0.49	98.27	6.4	43935
China	0.2	0.92	52.37	0.065	8154
Denmark	8.49	0.3	104.82	24.695	51424

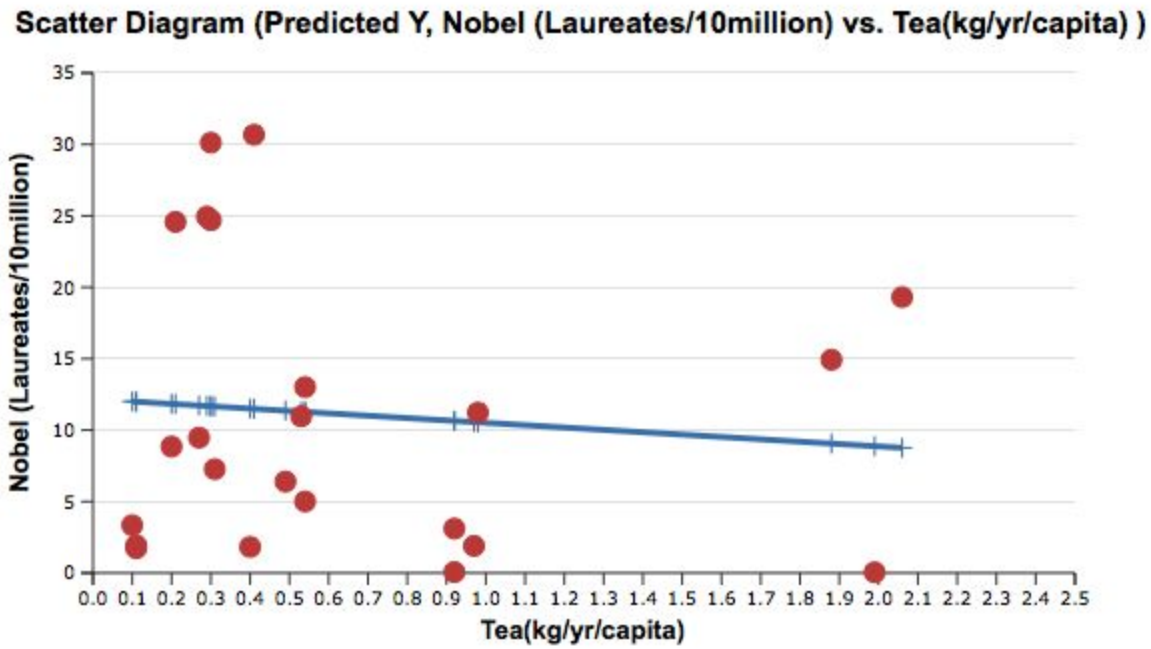
Finland	7.26	0.31	71.61	7.268	42159
France	6.34	0.27	93.44	9.473	37728
Germany	11.56	0.54	84.95	13.013	41267
Greece	3.51	0.4	78.25	1.826	17657
Ireland	7.5	1.88	98.64	14.93	48940
Italy	3.74	0.1	90.37	3.345	29847
Japan	2.09	0.97	45.65	1.896	32481
Norway	9.44	0.29	64.25	24.947	76266
Poland	4.5	0.92	74.25	3.108	12662
Portugal	2.72	0.11	88.09	1.932	18984
Spain	3.6	0.11	109.72	1.735	26327
Sweden	6.37	0.41	76.02	30.677	48966
Switzerland	10.51	0.3	72.92	30.125	82178
The Netherland	4.7	0.98	78.89	11.226	44333
United Kingdom	9.72	2.06	82.63	19.315	44118
United States	5.29	0.53	124.42	10.97	55904

Data Analysis



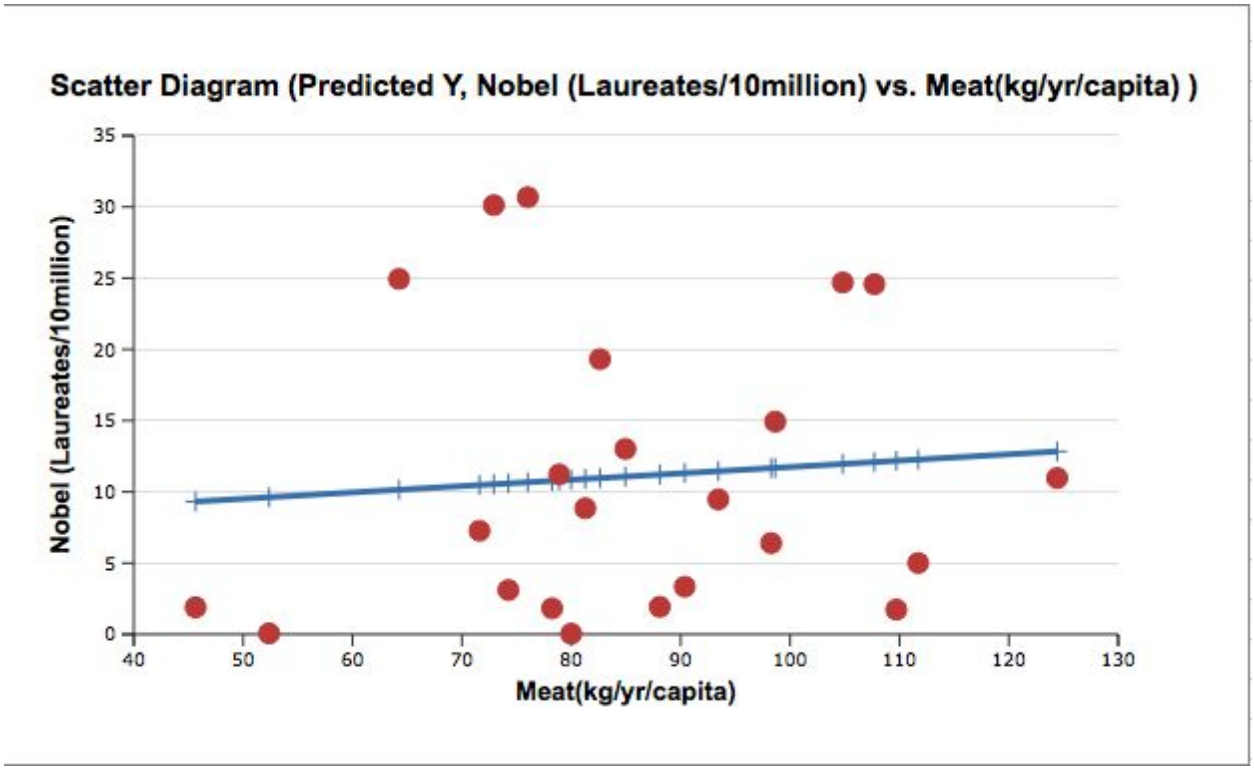
Regression Statistics

R(Correlation coefficient): 0.78464
R-square: 0.61566
Adjusted R-square: 0.59735
S: 6.31838
N: 23
Nobel (Laureates/10million) = - 4.2467 + 2.6601 * Chocolate(kg/yr/capita)



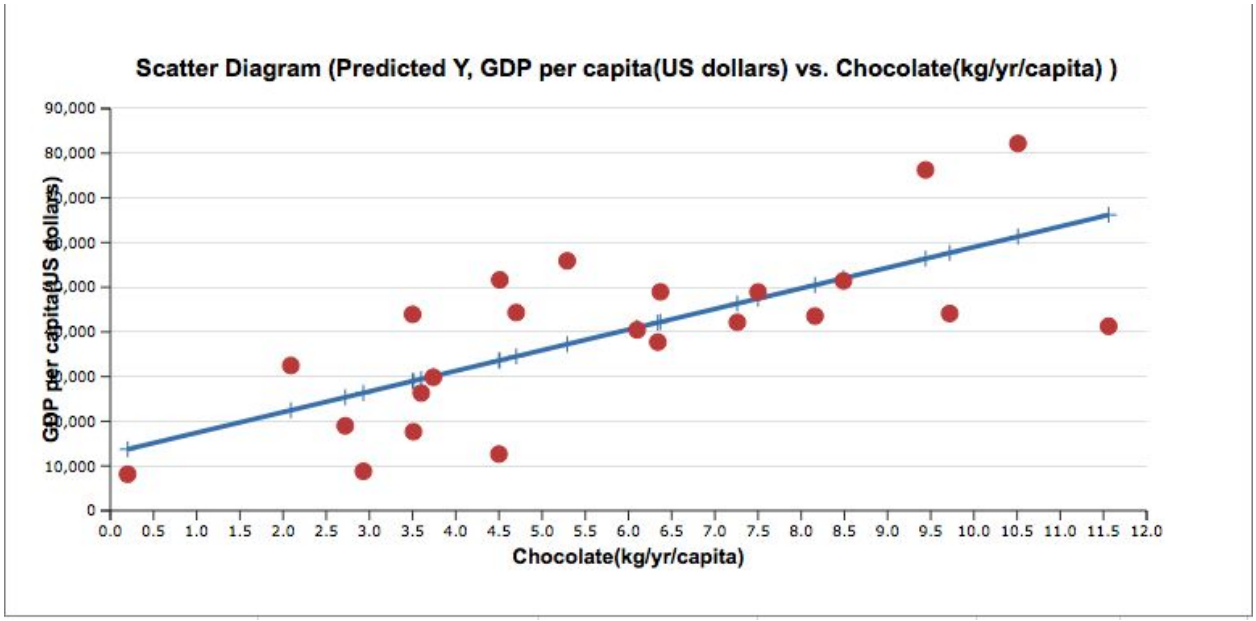
Regression Statistics

R(Correlation coefficient): 0.09868
R-square: 0.00974
Adjusted R-square: -0.03742
S: 10.14193
N: 23
Nobel (Laureates/10million) = 12.17272 - 1.65513 * Tea(kg/yr/capita)



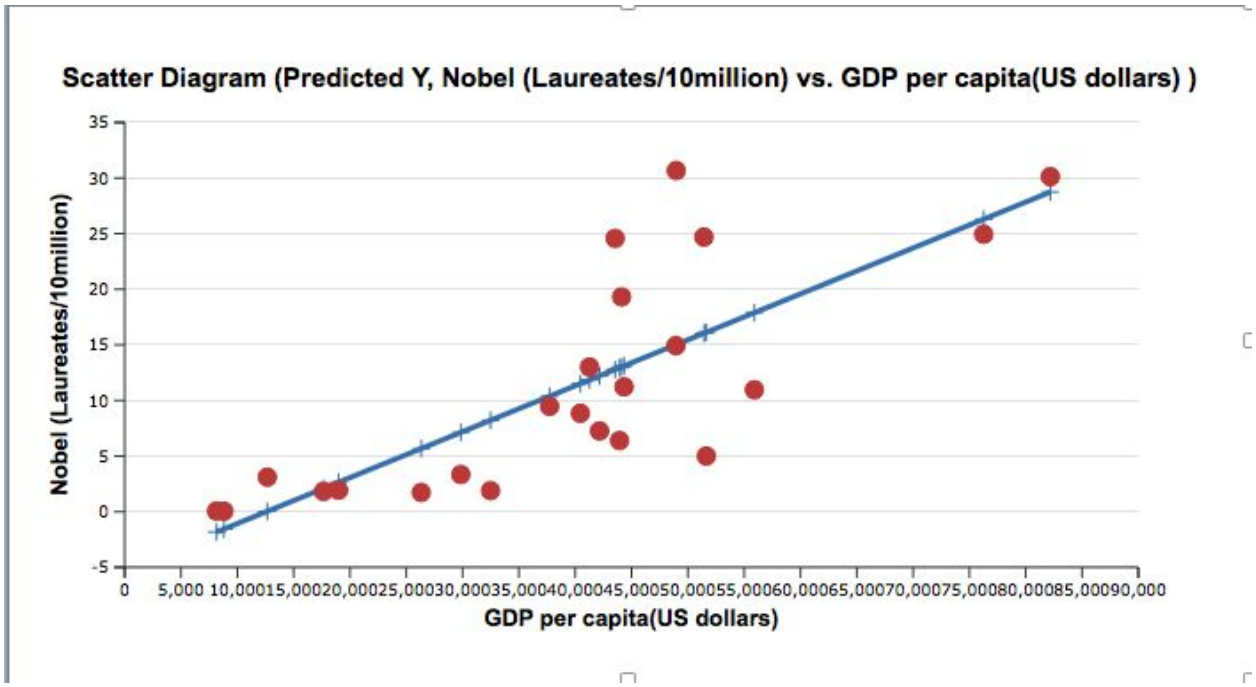
Regression Statistics

R(Correlation coefficient): 0.08521
R-square: 0.00726
Adjusted R-square: -0.04001
S: 10.15461
N: 23
Nobel (Laureates/10million) = 7.2799 + 0.04466 * Meat(kg/yr/capita)



Regression Statistics

R(Correlation coefficient): 0.71742
R-square: 0.51469
Adjusted R-square: 0.49158
S: 13,481.57387
N: 23
GDP per capita(US dollars) = 12,814.51837 + 4,618.37485 * Chocolate(kg/yr/capita)



Regression Statistics

R(Correlation coefficient): 0.78414
R-square: 0.61488
Adjusted R-square: 0.59654
S: 6.32475
N: 23
Nobel (Laureates/10million) = - 5.19343 + 0.00041 * GDP per capita(US dollars)

Conclusion

As we can see from the R-squared values for Nobel laureate v.s. chocolate consumption, Nobel v.s. tea consumption and Nobel laureate v.s. meat consumption, the only Nobel laureate v.s. chocolate consumption illustrates a significant linear relationship. Nevertheless, the quick conclusion that chocolate consumption leads to a higher cognitive function within a population as indicated by a number of Nobel laureates is not reasonable. Consumption of chocolate, unlike consumption of tea or meat which are more influenced by dietary habits, can be seen more as a general indication of life standards. The result could also be explained by the fact that countries which consume more chocolate might have a better life standard, therefore, have a better education system and higher research funding. (We can indeed see a significant linear relationship between chocolate consumption and GDP per capita) Such an explanation is further reinforced by our finding that number of Nobel laureates is highly linearly related to GDP per capita as in the last plot. As we proposed just above, consumption of chocolate may indicate life standard, we also found that GDP per capita is also highly linearly related to chocolate consumption, thus furthering proving our approach to explaining the reason why chocolate consumption is related to Nobel laureate.

Reference

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