
ISyE 2028 – Basic Statistical Methods - Fall 2015

Bonus Project: “Big” Data Analytics Proposal (or Final Report)

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Time Spent Exercising: Engineering vs. Non-Engineering

Here at the Georgia Institute of Technology, there is a very prominent stereotype, by which many, arguably most, students believe that engineering students generally have a larger workload than non-engineering students. Because of this, it is said that we engineering students are less physically fit than non-engineering students. I personally hypothesized that engineering and non-engineering students would have similar amounts of exercise, because I think that when one has the desire to stay healthy and fit, he or she will make the time to do so despite workload. Despite this, I believed that amends needed to be made as soon as possible if non-engineering students do in fact have lesser workloads than engineering students, because all students should have equal opportunities to stay healthy. I wanted to determine whether or not these stereotypes actually held true. I collected my data specifically to analyze whether or not there was in fact a difference in the amount of time that Georgia Tech students spent doing physically exercising depending on whether or not they are engineering majors through a series of surveys. I did so online as well as in different major buildings around campus such as the CULC, CRC, College of Business, and Student Center.

Exercise vs. Major

What is your major?

- Engineering
 Non-Engineering

Approximately how many hours do you spend exercising per week?

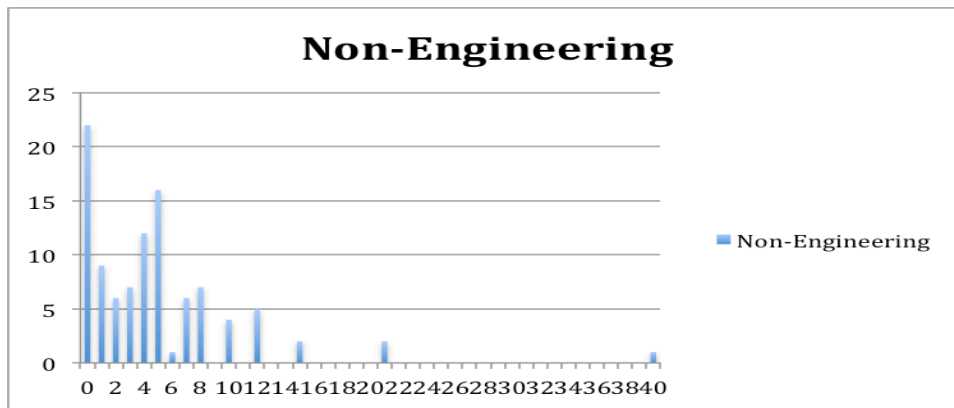
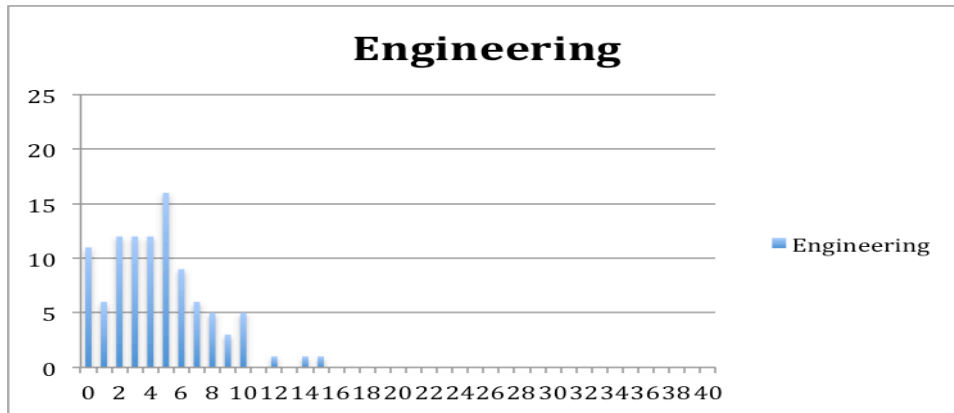
Please answer with a number only.

Submit

I decided it would be better to vary the places I collected data firstly because I felt that it would reduce potential bias from people in certain areas having some type of similarity. For example, if I chose to only interview people in the CRC, there would have been a higher probability that the majority would have been students who exercise regularly, thereby excluding many students who do not exercise as much. Likewise, if I only interviewed students in the CULC, there would have been a possibility that I would have surveyed more students who studied more often and therefore exercised less. This worked out well because I collected data from exactly 100 engineering students and 100 non-engineering students, each with diverse amounts of exercise times. Looking back, I could have reduced bias from my sample even more if I had collected data during different times of the day, or throughout a longer period of time. It is possible that people who wake up earlier are the ones who exercise and then go to class. It is also possible that the earlier in the year it is, the more people tend to exercise, due to a lesser initial workload.

Using the data I collected, I constructed two histograms outlining hours spent doing physical exercise for engineering and non-engineering students. Surprisingly, the engineering students tended to deviate less in the amount of hours they spent exercising versus non-engineering.

Mean	4.48	5.14
Median	4	4
Mode	5	0
Standard		
Deviation	3.167001577	5.906715917
Min	0	0
Max	15	40



Both had similar means, but non-engineering students had over 20 people answer that they exercised 0 hours while also having many more people answer that they exercised above 15. Nevertheless, the non-engineering mean amount of hours spent exercising was slightly higher than engineering. However, when I looked at the data again, I realized that I had not accounted for outliers. After recreating the histograms and recalculating the means, I saw that both means were much closer together, which was starting to lead me to believe that I had hypothesized correctly. After constructing a 95% confidence interval that will outline the average difference in the mean amount of time spent exercising, I saw that I did in fact hypothesize correctly. The confidence interval was $[-1.4415, 0.8257]$ showing that there is no significant difference. Although the numbers do slightly lean towards non-engineering students, I believe that if I were to conduct this study again, there is a possibility that they would lean just as much in the other direction.

CI outlier-inclusive: $[-1.9842, 0.6642]$

CI outlier-exclusive: $[-1.4415, 0.8257]$

These results are incredibly significant and relevant because it goes to show that we as engineering students cannot really make excuses when it comes to dedicating time to physical exercise. Studies have in fact shown that regular exercise can actually

increase the size of the hippocampus, which is the part of the brain that controls memory and learning! There have also been studies that have shown that people tend to have much more energy throughout the day when they exercise compared to when they do not. If I conducted this study again, I would collect data during a larger time frame; for example, collect data over the course of an entire semester. I feel that even though engineering and non-engineering students do not vary significantly in hours spent exercising, there was a significant proportion of all students who answered that they exercise 0 hours. To me, this is incredibly unhealthy and I worry for those students. I feel that there should be new initiatives to encourage GT students to be healthier, because it is relatively well known that students tend to leave this school much less healthy than they entered it. That, I can say from experience. If new initiatives and incentives were put in place, the study I conducted could also be used to measure the progress over the course of years in average amounts exercising and hopefully see an increase.

	Engineering	Non-Engineering
0	11	22
1	6	9
2	12	6
3	12	7
4	12	12
5	16	16
6	9	1
7	6	6
8	5	7
9	3	0
10	5	4
11	0	0
12	1	5
13	0	0
14	1	0
15	1	2
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	2
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0

39	0	0
40	0	1