

PROJECT 2

AVERAGE HEIGHT DEVIATION IN MEN BORN IN FIRST VERSUS SECOND HALF OF YEAR

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Abstract

There are many complex reasons that people may line up with or deviate from the average height of their peers. In this experiment our hypothesis is that the distribution of height among men is affected by the season they were born in. To test, we took data from men born throughout the year and compared the first six months to the final six months of the year. We concluded that the deviation from average height for those born in the first half of the year is smaller than for those born in the second half of the year.

I. INTRODUCTION

The development of cells into human beings in a complex process. The outcome is based on both genetics and environment. Although genetics are personal, environment is not. People of all different ages, health, gender, and background can have varying outcomes based on environmental factors.

Our hypothesis is that the distribution of height among men is affected by the season they were born in. By designing an experiment that compares men's heights born in the first six months of the year versus those born in the final six months of the year. Let's look at our experimental data and see what we can deduce.

II. ALGORITHM ANALYSIS

The code answers the question of whether or not men born in the first half of the year have a different deviation from average height compared to those born in the latter half of the year. The scenario 1 corresponds to first half of the year and scenario 2 corresponds to the second half.

The input code simulates an experiment with two configurable parameters. [1] The parameters feed into a probability distribution that also has its own probability function we will call Alpha normal. In the program, [2] this means that if the Alpha normal function is equal to one, the probability function will generate a random number from a normal distribution with mean of zero and a standard deviation equal to the value parameter one. [3] If the Alpha normal function is equal to 2, the random number from the normal distribution will have a mean of zero mean of zero and have a standard deviation equal to parameter two. [4] A normal distribution works best for deviations.

If the random number is not equal to 1 or 2, the program will return a value error message that there is an invalid scenario value. [5] This represents if a person is trying

to enter the data of their height and birth month for this experiment, but the information input is in error.

The second code [6] reads data from a text file which contains simulated data for two different scenarios. [7] The code splits the data into two sets based on the scenario number and creates separate histograms for each scenario. [8] The histograms are then plotted on the same plot with a legend indicating which scenario corresponds to each histogram. [9]

III. OUTPUT INTERPRETATION

The question that can be answered in this experiment is whether the distribution of height among men born in a certain half of the year is different.

The outcome of the experiment is plotted below. Scenario one is deviation from average heights of the men born in the first six months of the year. Scenario two shows the deviation from average height of men born in the second half of the year.

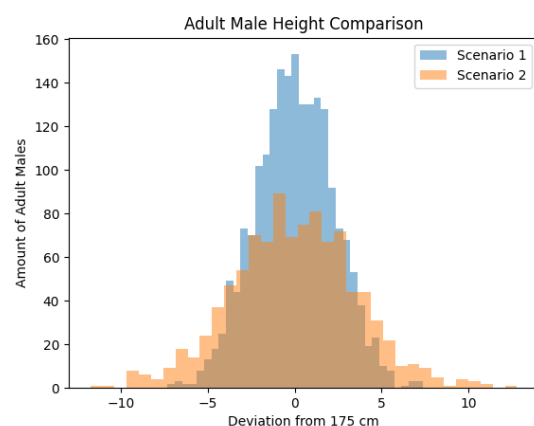


Figure 1: Scenario 1 shows deviation from average height for men born in first half of year. Scenario 2 shows deviation from average height for men born in second half of year.

It can be shown via the data that men born in the beginning half of the year, who participated in this study, have a smaller deviation from average height than those born in the latter half of the year, who participated in this study.

IV. CONCLUSION

We conclude that the deviation from average height for those born in the first half of the year is smaller than for those born in the second half of the year. However, many more experiments will need to be conducted to understand how time of year may play a role in height.

V. REFERENCES

- [1] <https://www.pythontutorial.net/python-basics/python-write-text-file/>
- [2] <https://www.programiz.com/python-programming/if-elif-else>
- [3] <https://www.geeksforgeeks.org/random-normalvariate-function-in-python/>
- [4] <https://www.pythontutorial.net/python-basics/python-write-text-file/>
- [5] <https://www.geeksforgeeks.org/writing-to-file-in-python/>
- [6] <https://sparkbyexamples.com/python/python-convert-string-to-float/>
- [7] <https://stackoverflow.com/questions/6981717/pythonic-way-to-combine-for-loop-and-if-statement>
- [8] <https://www.geeksforgeeks.org/how-to-plot-two-histograms-together-in-matplotlib/>
- [9] <https://www.geeksforgeeks.org/how-to-plot-data-from-a-text-file-using-matplotlib/>