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Math 1040

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Soda Consumption Vs Number of Cavities

Our first quantitative variable is daily soda consumption. The unit of measurement for this variable is ounces. Values for this first quantitative variable are 12oz, 24oz, and 36oz 48 oz.

Our second quantitative variable is how many cavities a person has had. The unit of measurement for this variable is one unit for every one cavity a person has had. Values for this second quantitative variable are 1 cavity, 2 cavities and 3 cavities 4 cavities

The research question is "Is soda consumption related to a person getting cavities?"

To answer this research question, the group will gather data as follows:

We would obtain 42 people for the random sample. To accomplish this we would use a systemic sampling process. The goal would be for each of us to collect seven responses, from the contacts in the mall/work. We would start at the 7th contact, and sample every 9th contact until our desired number of responses has been collected.

Group 12 Data	Soda (oz)	# of cavities
Jessica	336	0
	168	10
	0	0
	336	20
	32	3
	24	3
	112	40
Heather	24	0
	12	2
	84	0
	0	3
	0	0
	6	4
	0	1
Ryan	0	3
	20	8
	60	20
	12	2
	30	7

	12	2
	0	1
Ashlie	12	20
	12	4
	20	1
	0	0
	84	24
	0	3
	24	4
Chris	12	5
	24	5
	0	12
	0	3
	0	18
	120	9
	48	4

Statistics/Box Plot for soda consumption
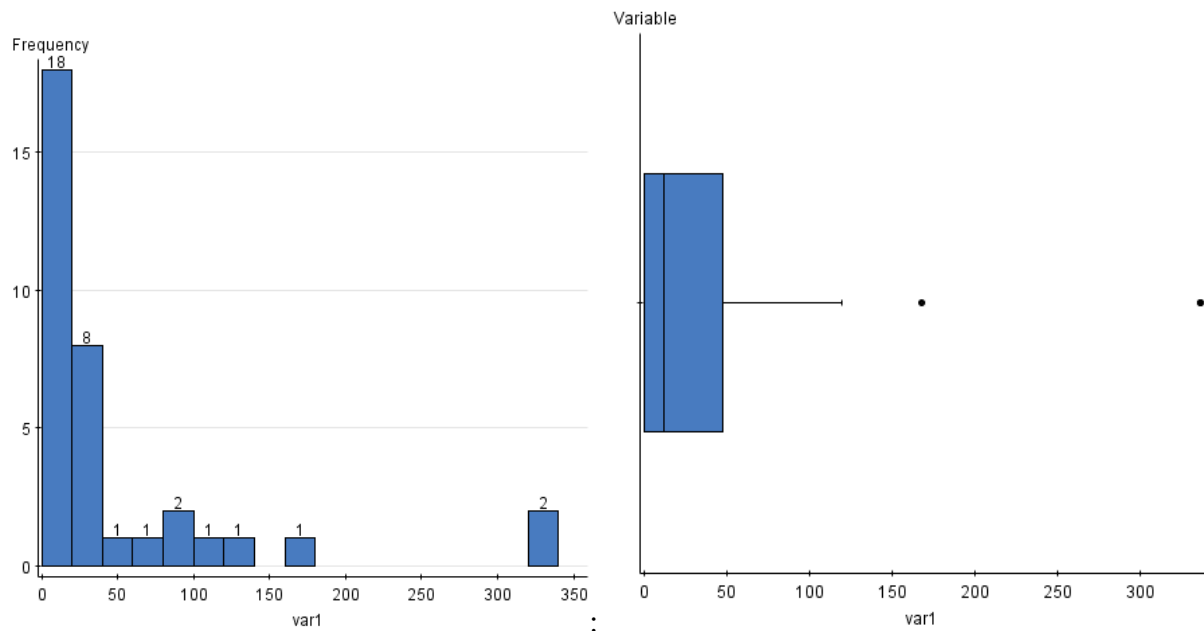
Column	Mean	Std. Dev.	Median	Range	Min	Max	Q1	Q3	Mode	Outlier
Soda	46.4	82.524574	12	336	0	336	0	48	0	336, 168

Statistics/Box Plot for number of cavities
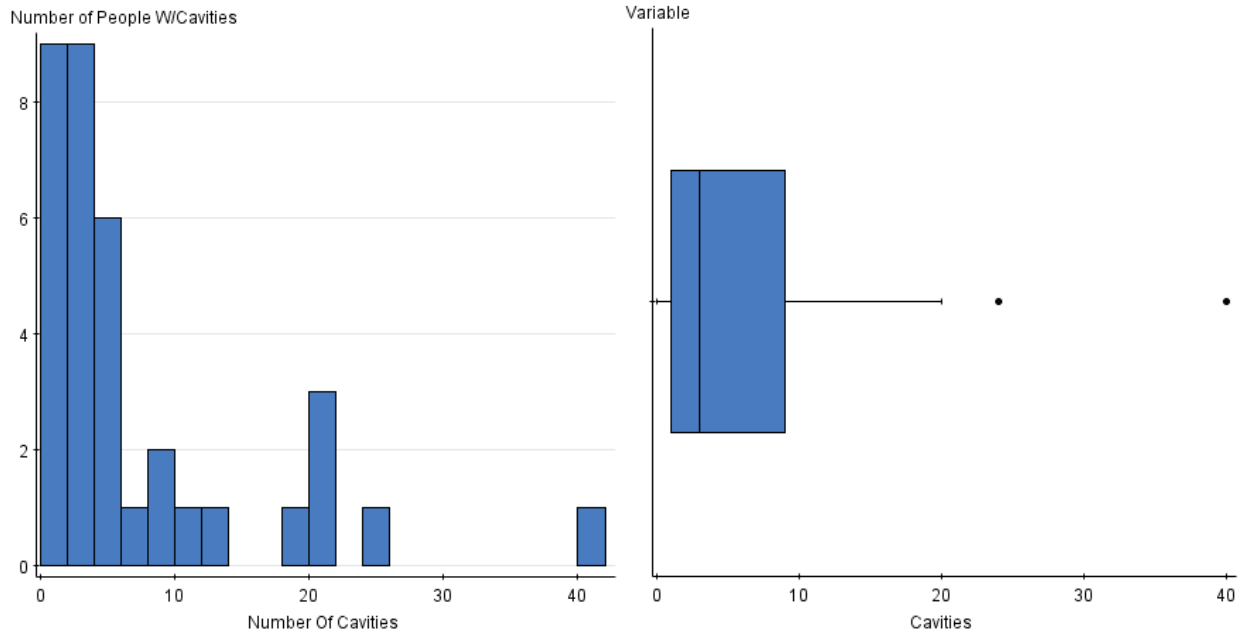
Column	Mean	Std. Dev.	Median	Range	Min	Max	Q1	Q3	Mode	Outlier
Cavities	6.885714	8.847636	3	40	0	40	1	9	0,3	24, 40

R (correlation coefficient) =   0.2982

Equation for line or regression: $y = 0.032x + 5.402$

Number of Cavities vs Soda

$$y = 0.032x + 5.402$$

- ◆ Number of Cavities
- — Linear (Number of Cavities)

X-axis: Soda Consumption
Y-axis: Number of Cavities

Difficulties/Surprises
There were not too many surprises or problems that we encountered while doing this project. I would say the hardest part, was getting the participants of the study to give accurate estimates of the amount of soda they drink. This variable had the most outliers, and made the scatter plot a little all over the place, as well as other visual representations of the data. Other than that, everything was very straightforward and easy to accomplish.

Analysis
Both of the variables were well distributed, we had a wide range of data in the samples we collected, which gave us a more accurate reading. There seemed not to be a close enough correlation in the data, the R value we collected, was less than the critical value from the table. Our critical value was 0.349, when using a 0.05 level of significance, and our R value was 0.2982 which meant that we had to reject our null hypothesis and accept our alternative hypothesis. All in all, this stated that there was in fact no relation between soda consumption and an increase in cavities over the lifetime of a given person.

Interpretation/Conclusion

Although our R value and the critical value turned out to have to correlation in one another, I think if the data had been more accurately dealt with, in the response from the participants, there would have been a change in the data which would have shown a relationship between these two variables. Possibly, cutting out some of the 'extreme' values in this project, then redoing the R values, would prove this point. But for the sake and integrity of the collecting and data itself, we need to read it and accept it at face value for what it is. I think we have answered the original question, by finding that, there is no correlation between soda consumption and the amount of cavities a person has had. Although it is not the answer we were looking to get, it is the answer which the data revealed.