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Applied Statistics

5/13/2022

Writeup for Applied Statistics

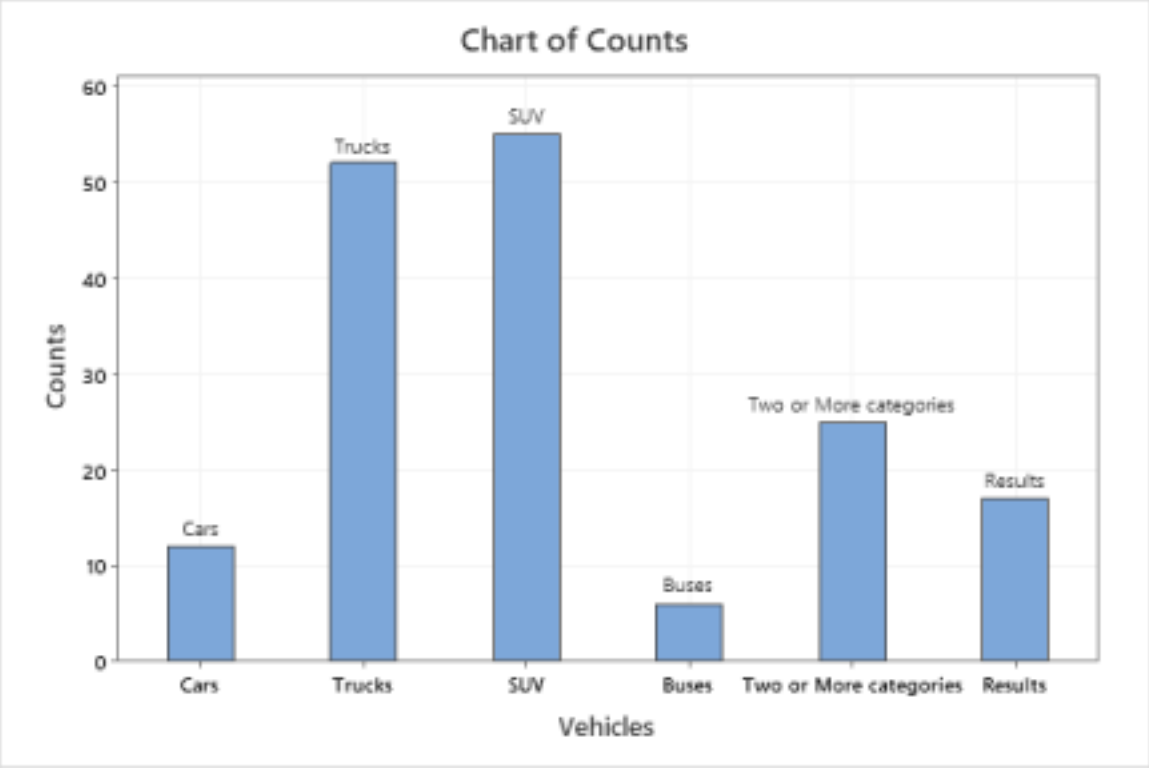
Research Question 1: What type of vehicle creates and releases the most pollutants?

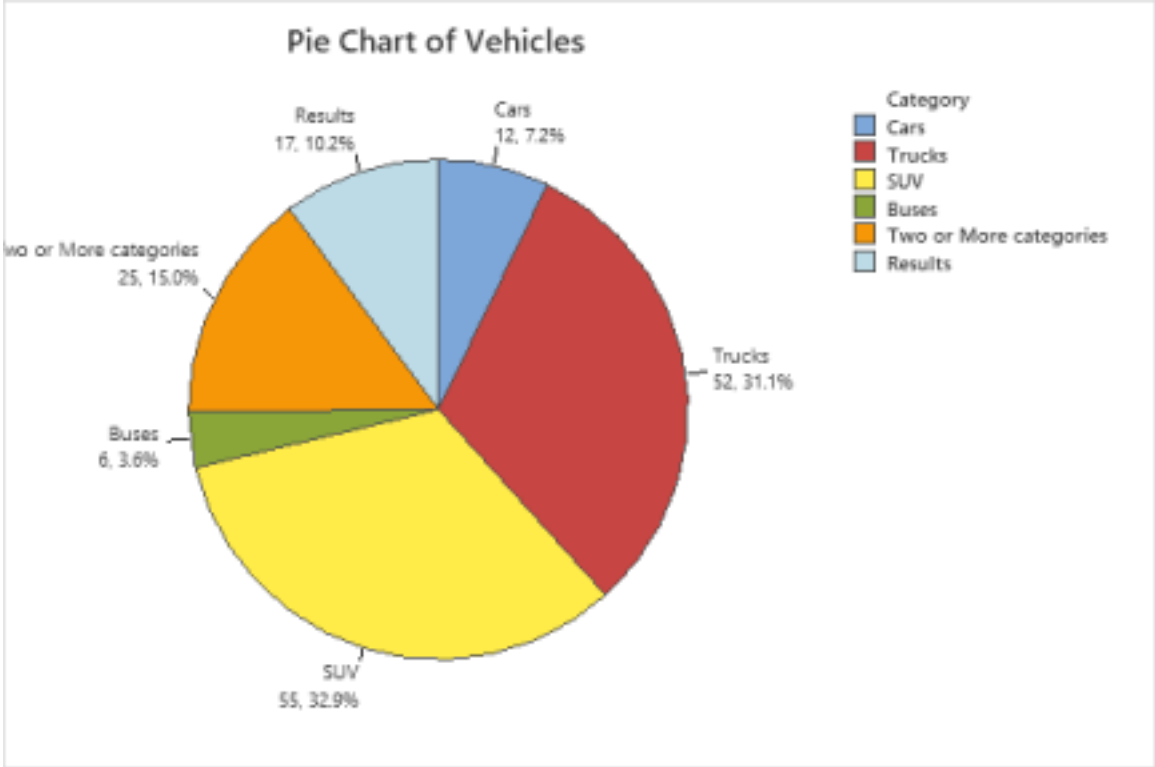
The categories given to pollsters were the following: Cars, Trucks, SUVs, Buses, Two or More Categories and Results. The category for Results was allowed in order for curious pollsters to not skew the results by voting just to see the answers. For the purposes of this assignment, I used Reddit as it was a simple yet effective way to reach a large sample size quickly.

Research Question 1: Variables

The categorical variable is the type of vehicle

The quantitative variable is the number of people who felt the specific type of vehicle polluted the most.





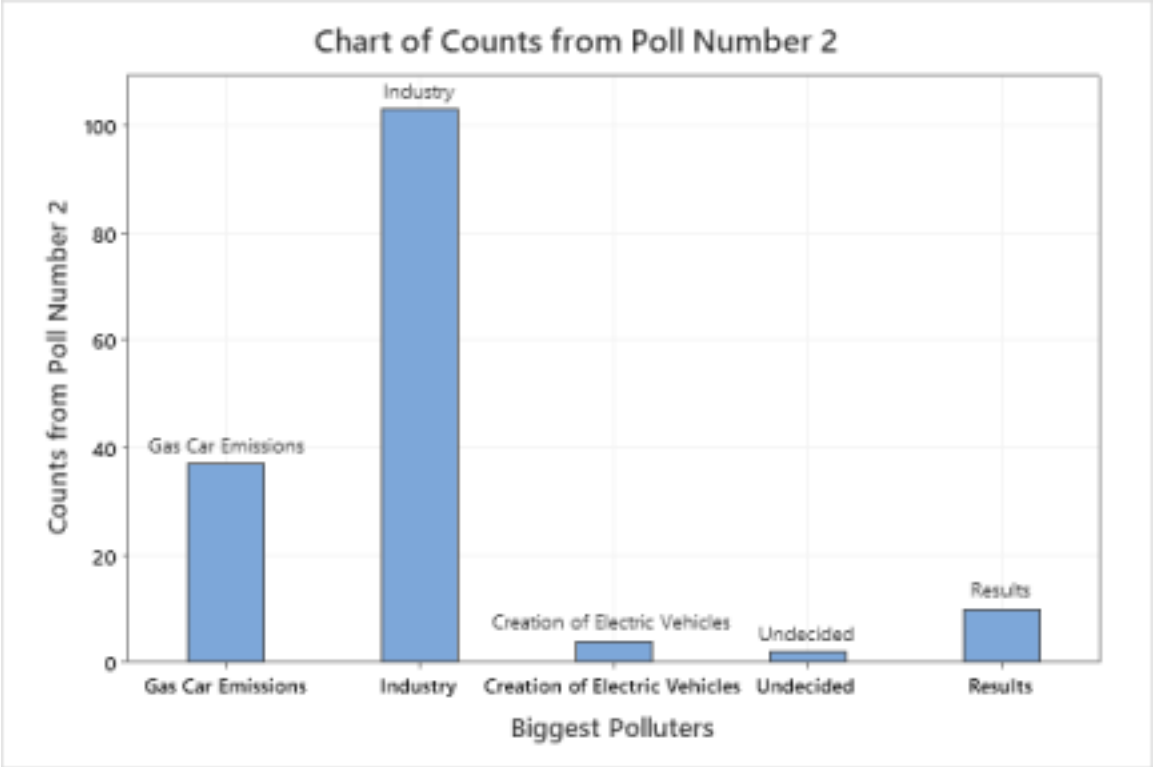
Research Question 2: Which of the following categories do you feel contributes the most to pollution?

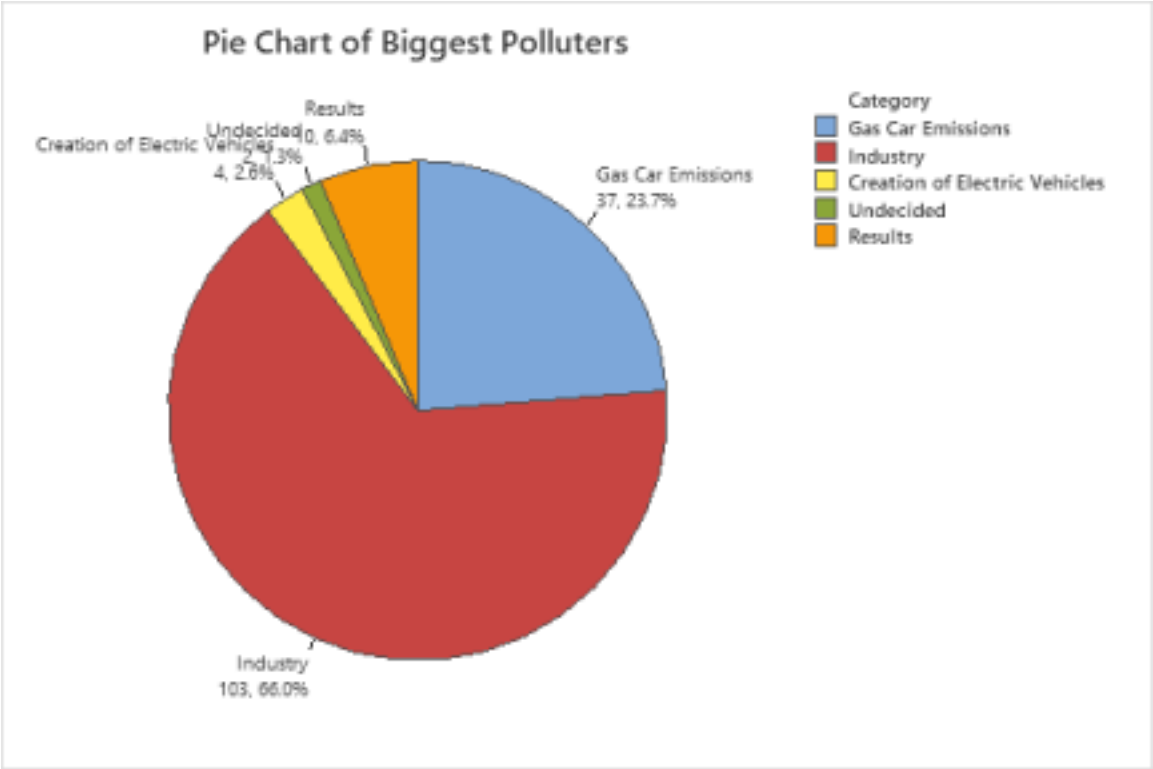
Research Question 2 Variables:

The categorical variables are Gas Car Emissions, Industry, Creation of Electrical Vehicles, Undecided and Results.

The quantitative variables are the number of people who felt that a specific category was the biggest polluter.

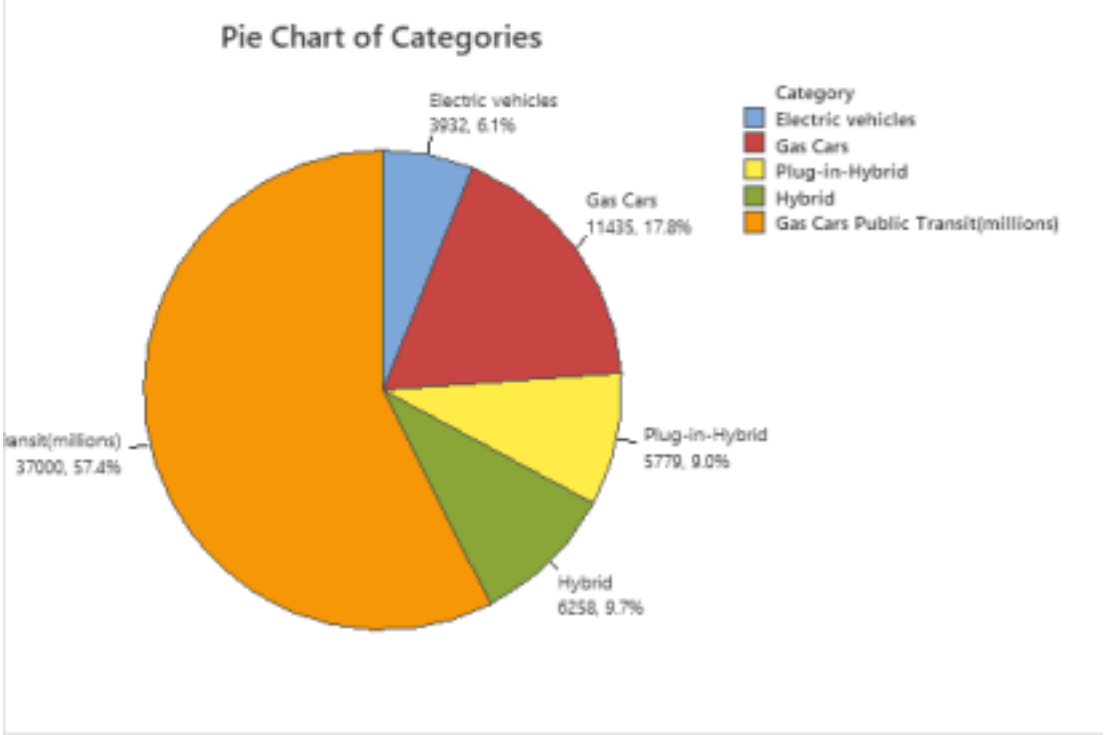
As the total sample size was over 30 I did not need to perform a probability plot or boxplot.



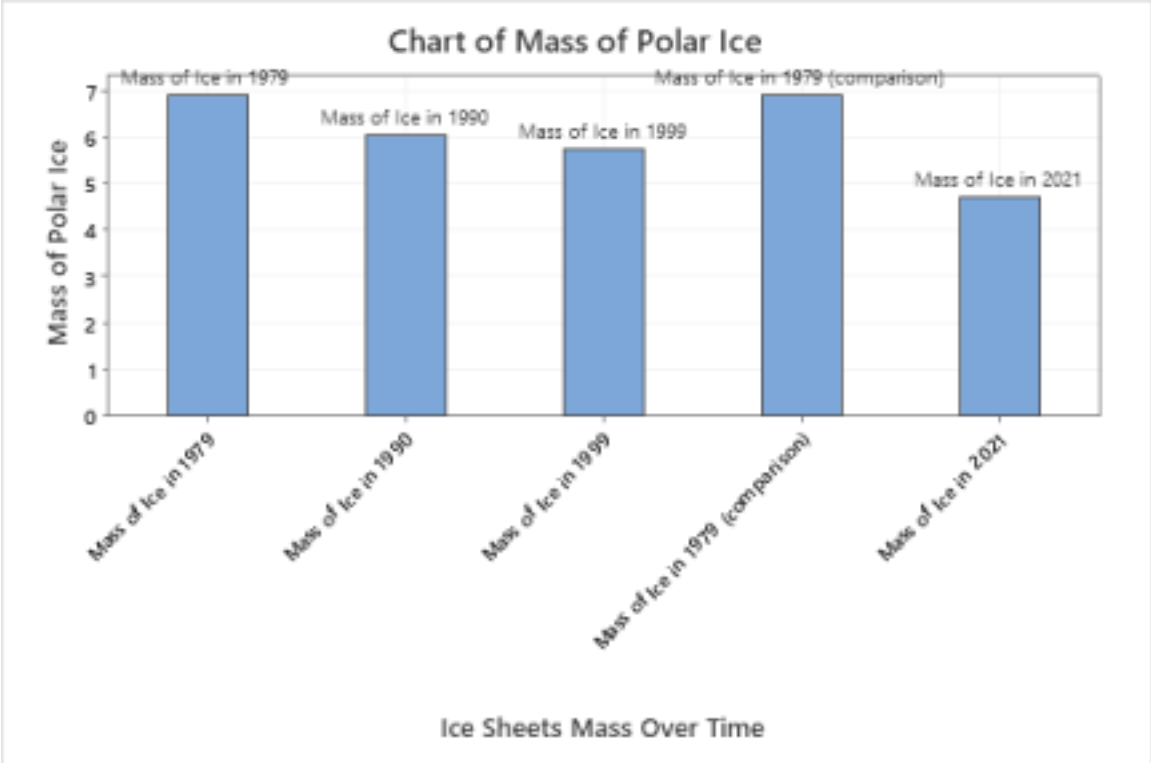


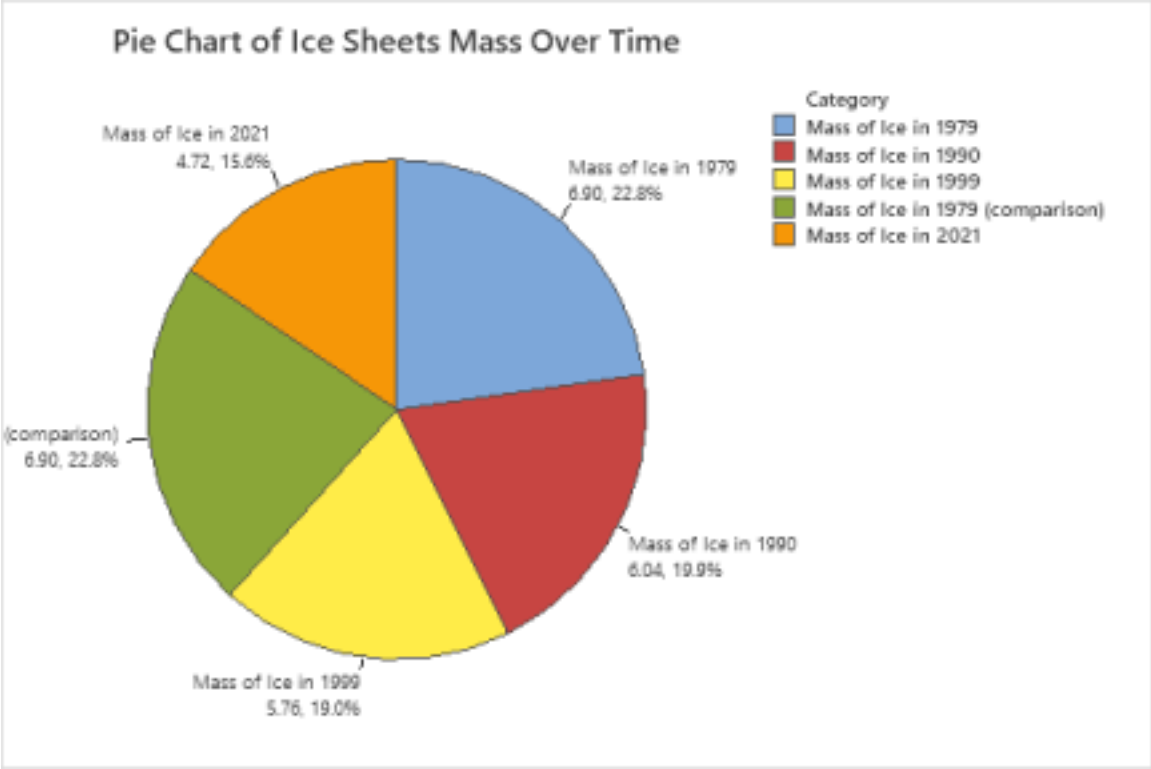
Research from Industry

Here we have the volumes of gas released based on research from industry. We can see how it differs from the above graphs that are based on public perception as well.



Volumes of Ice Over Time





Differences between Poll and Industry:

WORKSHEET 1

One-way ANOVA: Counts, Counts from Poll Number 2, Volumes of Co2, Mass of Polar Ice

Method

Null hypothesis	All means are equal
Alternative hypothesis	Not all means are equal
Significance level	α = 0.05

Equal variances were assumed for the analysis.

Factor Information

Factor	Levels	Values
Factor	4	Counts, Counts from Poll Number 2, Volumes of Co2, Mass of Polar Ice

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	629893767	209964589	4.71	0.014
Error	17	758213620	44600801		
Total	20	1388107386			

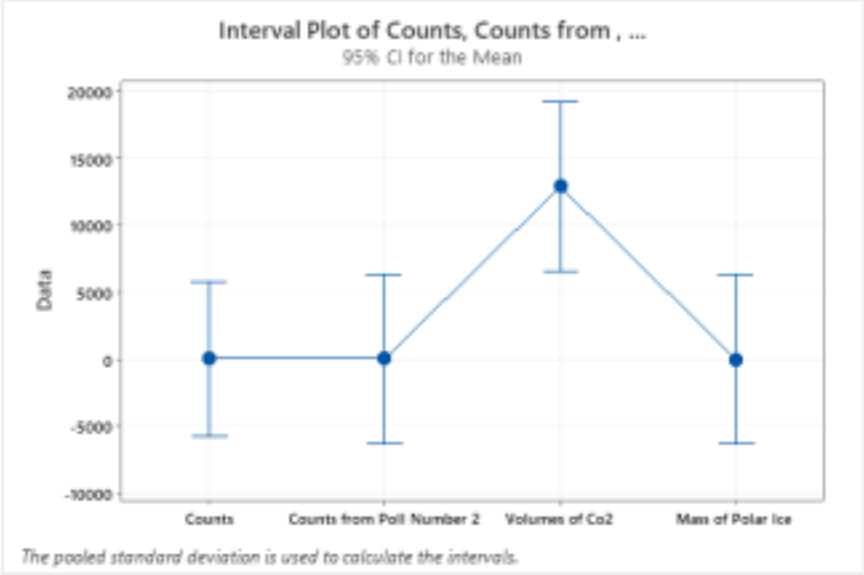
Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
6678.38	45.38%	35.74%	14.65%

Means

Factor	N	Mean	StDev	95% CI
Counts	6	27.83	20.86	(-5724.45, 5780.12)
Counts from Poll Number 2	5	31.2	42.5	(-6270.1, 6332.5)
Volumes of Co2	5	12881	13768	(6579, 19182)
Mass of Polar Ice	5	6.064	0.908	(-6295.246, 6307.374)

Pooled StDev = 6678.38



The pooled standard deviation is used to calculate the intervals.

Conclusion

In conclusion, the results of the poll differed from the actual research from industry. For

example, in our poll the respondents felt that the larger polluters for vehicles would be SUVs; 55 people, comprising 32.9 percent of our population sample, voted for this category. The category that received the least votes was buses. Industry was voted the greatest offender. Here, 103 people voted for this specific category. This block accounted for around 66 percent. When it came to our actual research, gas cars providing public transit were the biggest polluters. These vehicles spewed around 37,000 (millions) volume of Co2 per year, while electric vehicles polluted the least amount. As for the effect of the melting of the polar ice caps, the year with the most volume of ice was 1979 and the year with the least amount of ice was 2021.