I hereby confirm that the information provided by me is of completely my own work.
Signed: Johnny Do
SID: 861003761

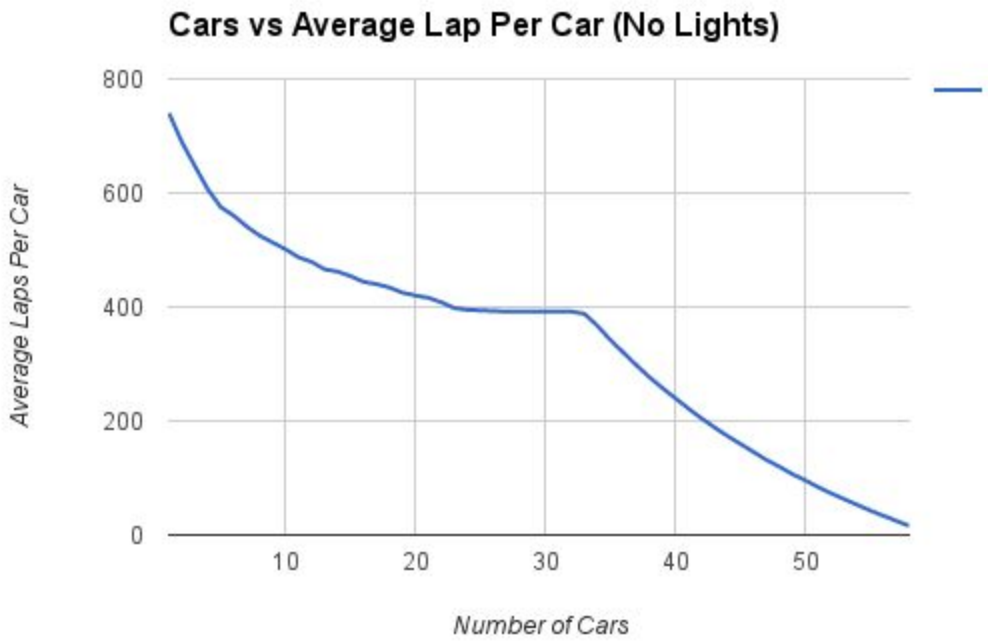
Data Link GO HERE For Full Data
https://docs.google.com/spreadsheets/d/1NxdQFLLHJceLcmOVW5KjiOLm4w2T_ZM7_6p_oG9Gz7M/edit?usp=sharing

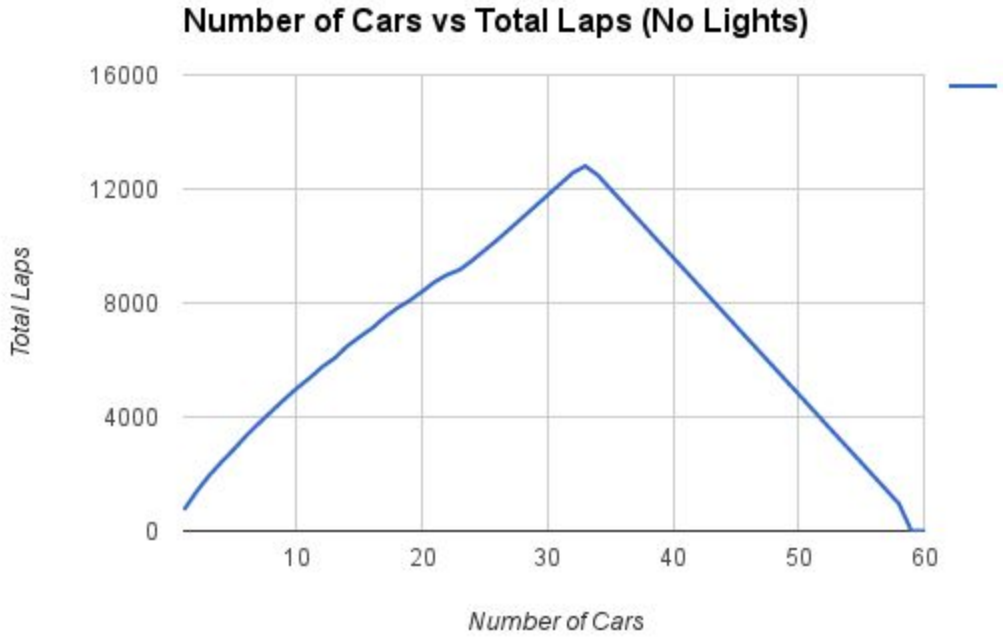
It is recommended to view the data set.

Information used was transferred over, somewhat, to aid in answering the questions.

Experiment Questions Answered In Following Pages

Without Lights





Experiment:

Measure the throughput (number of trips completed around the loop per hour) as a function of the number of zombies and find its maximum.

WIthout lights, the maximum is 33 cars on the road. We can somewhat estimate that value by looking at the graph, however with further analysis of the data on the spreadsheet, it is clear that if the number of zombies is 33, then we have a maximum.

What happens at "rush hour" when the roadway is (almost) completely filled with zombie cars?

At rush hour, when the roadway is almost completely filled, the actual throughput decreases dramatically. We see that from the graphs, it drops to almost nothing or nothing. Viewing the program data, we can more accurately see the number of laps is less.

confidence intervals

Using the formula: mean (+/-) t * (s / sqrt(n))

With values:

T = 1.96

Confidence Level = 0.95

Alpha = 0.025

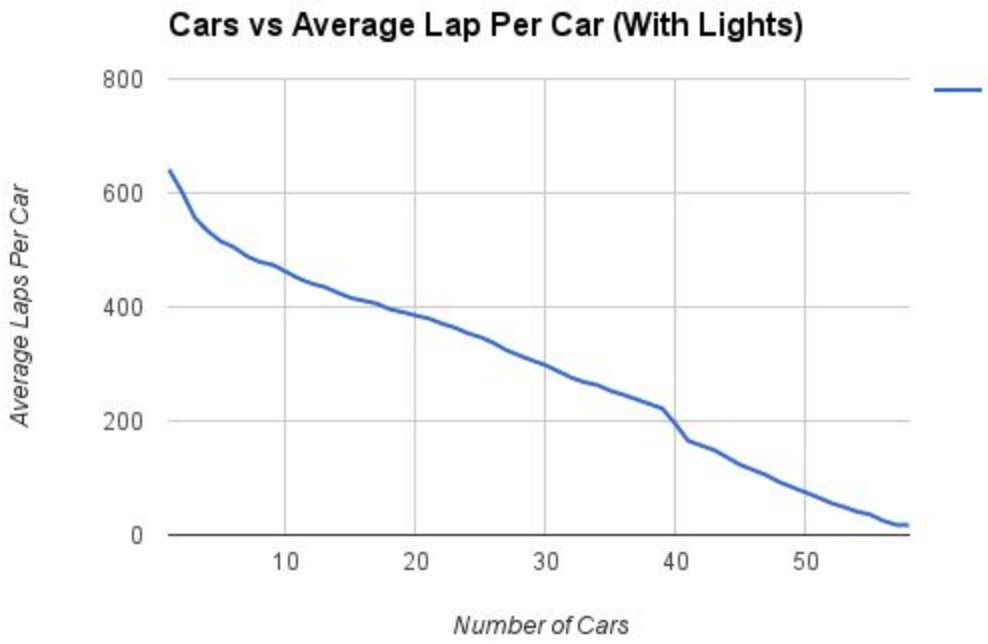
Mean = 337.862069

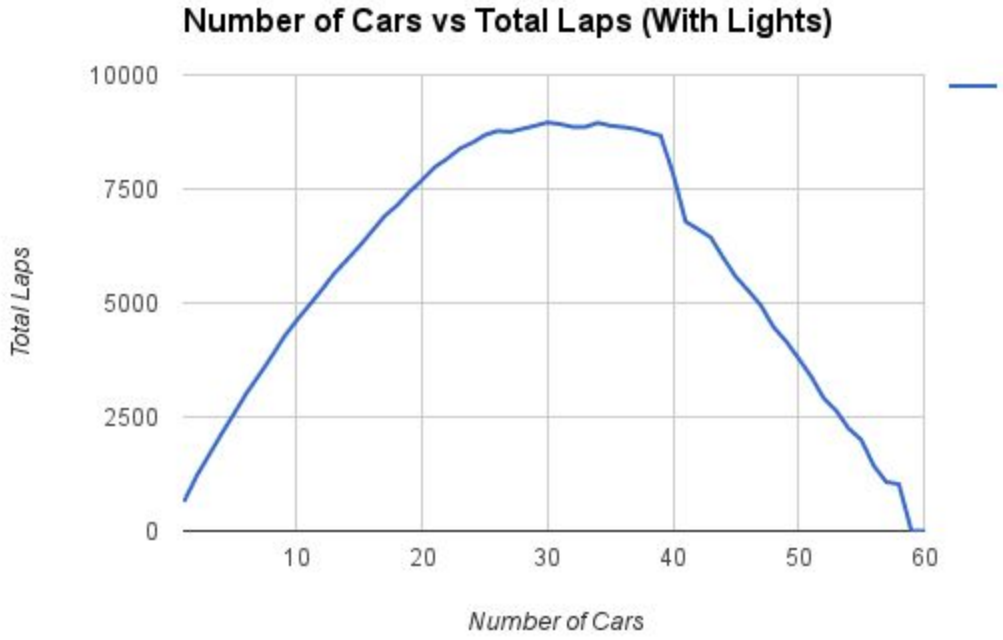
Standard Deviation = 183.2090598

Total Samples = 58

Our interval is [290.7112739 to 385.0128641]

With Lights


Cars vs Average Lap Per Car (With Lights)
800
600
400
200
0
Average Laps Per Car
10
20
30
40
50
Number of Cars


Number of Cars vs Total Laps (With Lights)
10000
7500
5000
2500
0
Total Laps
10
20
30
40
50
60
Number of Cars

Experiment:

Measure the throughput (number of trips completed around the loop per hour) as a function of the number of zombies and find its maximum.

WIth lights, the maximum is 30 cars on the road. We can somewhat estimate that value by looking at the graph, though there seems to be some other values that could just as easily be the maximum, however with further analysis of the data on the spreadsheet, it is clear that if the number of zombies is 30, then we have a maximum.

What happens at "rush hour" when the roadway is (almost) completely filled with zombie cars?

At rush hour, when the roadway is almost completely filled, the actual throughput decreases dramatically just as before we installed the light and maybe even more so. We see that from the graphs, it drops to almost nothing or nothing. Viewing the program data, we can more accurately see the number of laps is less, even more so than the no light data. The stops here and there due to the light has quite the effect.

Using the formula: mean (+/-) t * (s / sqrt(n))

With values:

T = 1.96

Confidence Level = 0.95

Alpha = 0.025

Mean = 337.862069

Standard Deviation = 183.2090598

Total Samples = 58

Our interval is [246.3125507 to 332.8253804]