Stop Sign Shenanigans

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Introduction

The purpose of our project was see to if there is a difference in the stopping habits made between the drivers pulling out of the student lots and the staff lot at Columbia College.

Definition and Assumptions

We defined our two populations as people who park in the student parking lots at the time of our data collection and people who park in the staff parking lot at the time of our data collection. We initially hypothesized that more people pulling out of the staff parking lot would stop at the stop signs than those pulling out of the student parking lot.

Methodology

To conduct this project we chose 10 random days out of a 4 business week period (October 16 - November 3) to go and observe each vehicle's actions leading out of the staff parking lot and the student parking lot. We recorded our data at 3 random 25 minute time slots during each day; one time in the morning between 8am and 12pm, one time in the afternoon between 12pm and 4pm, and then one time in the evening between 4pm and 8pm. The first 5 random days of our data collecting we observed from the staff parking lot and the last 5 random days of our data collecting we observed from the student parking lot. At the time of observation we categorized each vehicle's action into whether they completely stopped at the stop sign, rolled through the stop sign, or slowed down while going through the stop sign. To help us chose our random 25 minute time slots and our 10 randoms days of recording data we decided to use *Random.org*. The data we collected during our observations can be found in the appendix.

Complications

Initially, when we were planning on how we were going to decide to record the data, we planned to only observe the vehicles exiting the different parking lots 15 minutes at a time. However, we soon realized that 15 minutes was not a long enough to record enough vehicle's for a large sample size. We then decided to increase the time to 25 minutes and found this to be better for the amount of vehicle's we were looking to observe.

Results & Conclusion

The categories "Complete Stop", "Slow Down", and Roll Through", make up the categorical variable "Stopping Habits". Likewise, the categories "Student Lot" and "Staff Lot" make up the categorical variable "Parking Lot".

H_o : Stopping habits and parking lots are not related.
H_a : Stopping habits and parking lots are related.

	Complete Stop	Slow Down	Roll Through
Student Lot	78	67	63
Staff Lot	52	62	44

Using the Chi-Square Two-Way-Table Test we found the following:

- Chi-Square statistic = 1.974
- P-Value = 0.373
- Degrees of Freedom = 2
- α level = 0.05

With the results of our data (p=0.373<0.05=α), we keep the null hypothesis. There is no evidence to suggest that there is a difference in stopping habits and parking lots.

Discussion: 30 Minute Parking

Due to the 30-minute parking located in the staff parking lot (anyone may park here), our results of the observations recorded in the staff lot may have been influenced by visitors parked in the 30-minute and not being actual staff members. Future studies may want to account for this.

References

Haahr, Mads. "True Random Number Service." *RANDOM.ORG*. N.p., n.d. Web. 01
    Sept. 2017.
Holt, Benjamin. "Mr. Holt's Courses." *Mr. Holt's Homepage*. N.p., n.d. Web. 01 Sept.
    2017.

Appendix: The Data

Josephine:

Where: Staff parking lot   Date: Monday Oct 16   Time: 12:20 - 12:24

Vehicle's action:	Complete stop	Slow Down	Roll Through
(6 cars)	I (1)	IIII (4)	I (1)

Where: Staff parking lot   Date: Wednesday Oct 18   Time: 12:50 - 1:15

Vehicle's action:	Complete stop	Slow Down	Roll Through
(8 cars)	IIII (4)	II (2)	II (2)

Where: Staff parking lot   Date: Wednesday Oct 18   Time: 5:15 - 5:40

Vehicle's action:	Complete stop	Slow Down	Roll Through
(9 cars)	III (3)	IIII (4)	II (2)

Where: Staff parking lot   Date: Friday Oct 20   Time: 10:10 - 10:35

Vehicle's action:	Complete stop	Slow Down	Roll Through
(4 cars)	I (1)	III (3)	(0)

Where: Student parking lot   Date: Wednesday Oct 25   Time: 1:00 - 1:25

Vehicle's action:	Complete stop	Slow Down	Roll Through
(5 cars)	II (2)	II (2)	I (1)

Where: Student parking lot   Date: Monday Oct 30   Time: 1:10 - 1:35

Vehicle's action:	Complete stop	Slow Down	Roll Through
(10 cars)	IIII (4)	IIIII I (6)	(0)

Where: Student parking lot   Date: Friday Nov 3   Time: 10:20 - 10:45

Vehicle's action:	Complete stop	Slow Down	Roll Through
(4 cars)	I (1)	II (2)	I (1)

Where: Student parking lot   Date: Friday Nov 3   Time: 12:00 - 12:25

Vehicle's action:	Complete stop	Slow Down	Roll Through
(6 cars)	I (1)	III (3)	II (2)

Sarah:

Where: <mark>Staff Parking Lot</mark>   Date: Friday October 20th   Time: 4:45 - 5:10pm

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(20 Cars)	IIIII II (7)	IIIII III (8)	IIIII (5)

Where: <mark>Student Parking Lot</mark>   Date: Monday October 23rd   Time: 10:45 - 11:10am

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(12 Cars)	IIIII I (6)	II (2)	IIII (4)

Where: <mark>Student Parking Lot</mark>   Date: Monday October 23rd   Time: 1:45 - 2:10pm

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(17 Cars)	IIIII I (6)	IIIII (5)	IIIII I (6)

Where: <mark>Student Parking Lot</mark>   Date: Monday October 23rd   Time: 4:45 - 5:10pm

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(23 Cars)	IIIII IIIII (10)	IIIII I (6)	IIIII II (7)

Where: <mark>Student Parking Lot</mark>   Date: Monday October 30th   Time: 10:45 - 11:10am

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(10 Cars)	III (3)	III (3)	IIII (4)

Where: <mark>Student Parking Lot</mark>   Date: Monday October 30th   Time: 4:45 - 5:10pm

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(14 Cars)	IIIII I (6)	IIII (4)	IIII (4)

Where: <mark>Student Parking Lot</mark>   Date: Friday November 3rd   Time: 4:45 - 5:10pm

Vehicle's Action:	Complete Stop	Slow Down	Roll Through
(22 Cars)	IIIII II (7)	IIIII III (8)	IIIII II (7)

Louis:

Where: <mark>Staff parking lot</mark>   Date; Monday Oct 16   Time: 11:45 - 12:10

Vehicle's action:	Complete stop	Slow Down	Roll Through
(2 cars)	II (2)	(0)	(0)

Where: <mark>Staff parking lot Date</mark>   Monday Oct 16   Time: 4:00 – 4:25

Vehicle's action:	Complete stop	Slow Down	Roll Through
(28 cars)	IIIII IIIII I (11)	IIIII IIIII (10)	IIIII II (7)

Where: <mark>Staff parking lot</mark>　　　　Date Tuesday Oct 17　　　　Time: 10:50 – 11:15

Vehicle's action:	Complete stop	Slow Down	Roll Through
(16 cars)	IIIII II (7)	IIII (4)	IIIII (5)

Where: <mark>Staff parking lot</mark>　　　　Date Tuesday Oct 17　　　　Time: 2:00 – 2:25

Vehicle's action:	Complete stop	Slow Down	Roll Through
(9 cars)	II (2)	IIIII (5)	II (2)

Where: <mark>Staff parking lot</mark>　　　　Date Wednesday Oct 18　　　　Time: 11:45 – 12:10

Vehicle's action:	Complete stop	Slow Down	Roll Through
(13 cars)	II (2)	IIIII I (6)	IIIII (5)

Where: <mark>Staff parking lot</mark>　　　　Date: Thursday Oct 19　　　　Time: 10:50 – 11:15

Vehicle's action:	Complete stop	Slow Down	Roll Through
(12 cars)	IIIII (5)	III (3)	IIII (4)

Where: <mark style="background-color:orange">Student parking lot</mark>　　　　Date: Tuesday Oct 24　　　　Time: 10:50 - 11:15

Vehicle's action:	Complete stop	Slow Down	Roll Through
(17 cars)	IIIII I (6)	III (3)	IIIII III (8)

Where: <mark style="background-color:orange">Student parking lot</mark>　　　　Date: Tuesday Oct 24　　　　Time: 6:30 – 6:55

Vehicle's action:	Complete stop	Slow Down	Roll Through
(19 cars)	III (3)	IIIII I (6)	IIIII IIIII (10)

Robert:

Where: <mark>Staff Parking Lot</mark>　　　　Date: Tuesday Oct 17　　　　Time: 4:40-5:05

Vehicle's action:	Complete stop	Slow Down	Roll Through
(13 cars)	III (3)	IIIII (5)	IIIII (5)

Where: <mark>Staff Parking Lot</mark>　　　　Date: Tuesday Oct 19　　　　Time: 5:00-5:25

Vehicle's action:	Complete stop	Slow Down	Roll Through
(5 cars)	(0)	III (3)	II (2)

Where: <mark>Staff Parking Lot</mark>　　　　Date: Tuesday Oct 20　　　　Time: 12:00-12:25

Vehicle's action:	Complete stop	Slow Down	Roll Through
(11 cars)	II (2)	IIIII (5)	IIII (4)

Where: <mark>Staff Parking Lot</mark>   Date: Tuesday Oct 24   Time: 1:45-2:10

Vehicle's action:	Complete stop	Slow Down	Roll Through
(2 cars)	II (2)	(0)	(0)

Where: <mark>Student Parking Lot</mark>   Date: Tuesday Oct 24   Time: 6:30-6:55

Vehicle's action:	Complete stop	Slow Down	Roll Through
(13 cars)	III (3)	IIIII (5)	IIIII (5)

Where: <mark>Student Parking Lot</mark>   Date: Wednesday Oct 25   Time: 11:30-11:35

Vehicle's action:	Complete stop	Slow Down	Roll Through
(21 cars)	IIIII IIII (9)	IIIII IIII (9)	III (3)

Where: <mark>Student Parking Lot</mark>   Date: Wednesday Oct 25   Time: 4:10-4:35

Vehicle's action:	Complete stop	Slow Down	Roll Through
(15 cars)	IIIII IIIII I (11)	III (3)	I (1)