# Breakdown

With the data from the ERAU parking committee we can model the transportation methods of ERAU students. We have the data for each student’s travel mode (car, bike, walk, skate), whether the student lives on campus, if they own a car and the current cost of parking pass, if they own a bike with registration and the cost of registration, and also if they own a skateboard. We can calculate accurate percentages of transportation methods with this data, because the students disclose whether it is their only transportation or if they have multiple. Some data to be considered is location of their dorm because that can affect their preferred transportation method depending on their distance to their class and will help the model better predict the students that did not participate in the sample size. The sample size will also affect the accuracy of the model.

# Relevant Theory

Due to chaos theory we can never accurately predict the transportation methods of the whole University but from the data provided we can calculate some conclusions about the transportation methods of student. A larger sample size is needed however to draw any conclusions on skateboards since none in the data set even own a skateboard or longboard. Also whether or not the students use their transportation method should be taken into account since only one person paid for their parking pass and bike lock.

# Assumptions

* Because of the provided data we are to assume that no student has a longboard, skateboard, or any other transportation method not included in the survey.
* We assume that the percentages scale with the rest of the students at the university.
* We assume that there is margin of error in determining the students mode of transportation.
* Because of the lack of data on parking passes and leased locks we must assume that it does not affect the rest of the data.
* Because of the lack of data on student dorm location, we must assume that dorm location does not affect the data.

# Solution steps

1. Acquire the data from each student, ( car ownership, on campus or off campus, skateboard, bike, and registration for each.)
2. Determine if the student lives on or off campus
3. Determine if the student owns a car
4. Determine if the student has a parking pass
5. Determine if the student owns a bike
6. Determine if the student has a bike lock
7. Determine if the student Leases a lock.
8. Determine if the student owns a skateboard.
9. If a student lives on campus assume they do not skate.
10. If a student lives on campus and does not own a bike or a bike assume they walk.
11. If a student lives on campus and owns a bike and a bike lock assume they bike.
12. If a student lives on campus and owns a bike and not a lock there is a 50/50 chance they walk verses bike.
13. If a student lives on or off campus and they have a bike with a lock, or a car, there is a 50 percent chance they bike, and a 50 percent chance they drive.
14. If a student lives off campus and only own a car there is a 70 percent chance they drive a 30 percent chance they carpool.
15. If a student lives off campus and doesn’t not own a car there is a 12 percent chance they uber, a 12 percent chance they rideshare and a 76 percent chance they carpool.
16. Else assume that the student walks.

# RESULTS

The results are biased off of the data above and dice roles:

|  |  |  |  |
| --- | --- | --- | --- |
| Student | Predicted method | Actual method | Correct |
| 1. | Walk | Walk | Yes |
| 2. | Bike | Walk | No |
| 3. | Bike | Bike | Yes |
| 4. | Bike | Bike | Yes |
| 5. | Walk | Bike | No |
| 6. | Drive | Walk | No |
| 7. | Drive | Drive | Yes |
| 8. | Carpool | Rideshare | No |
| 9. | Drive | Drive | Yes |
| 10. | Rideshare | Drive | No |
| 11. | Rideshare | Carpool | No |
| 12. | Drive | Drive | Yes |
| 13. | Bike | Drive | No |
| 14. | Drive | Drive | Yes |
| 15. | Drive | Bike | No |

Predicted totals: walk-2, bike-4, drive-6, rideshare-2, carpool-1

Actual Totals: walk-3, bike-4, drive-6, rideshare-1, carpool-1

Biased on the results from the model, it has an accuracy of 53%, but if it was only total of each transportation type then it is 93% accurate

I used Spenser Wright’s prediction dice roles for my model