Final Project Significant Results

Our Tables

Student_rutgers – contains student name, RUID, Gender, Permit, Car manufacturer, license plate, and number of credits available for use of the program.

parkedTimeTable – contains RUID, campus (of request), parkedtimeE (entered), parkedtimeD (departure), and lot #.

Queries

SELECT avg(gpa)
FROM student_rutgers s, parkedTimeTable p
where (TIME(parkedtimeE) between 'time1' and 'time2') and s.id=p.parkedruid

Query	Explanation	Result
SELECT * FROM student_rutgers s, parkedTimeTable p WHERE s.id=p.parkedruid AND (TimeDiff(Time(parkedtimeD), Time(parkedtimeE)) >'02:00:00')	Does an inner join on the RUIDs of both tables to return all times students went above the 2 hour parking permit limit.	**744**/1270=58.58% of requested temp permits went over the two hour limit. **201**/1270=15.26% went over 3 hours of temporary parking time.

GPA

Query	Explanation	Result
SELECT count(*) from parkedTimeTable where campus='campus'	Finds number of students who parked on each campus. Shown to the right is the result of the query in bold as well as the percentage of requests per campus.	**568**/1269=44.76% of requests were from Livingston **252**/1269=19.86% of requests were from Busch **251**/1269=19.78% of requests were from Douglass

		142/1269 =11.19% of requests were from College Avenue **56**/1269 = 4.41% of requests were from Cook
SELECT * FROM student_rutgers s, parkedTimeTable p WHERE s.id=p.parkedruid AND (TimeDiff(Time(parkedtimeD),Time(parkedtimeE)) >'02:00:00') AND (gpa >='2.0') AND (gpa <='3.0')	Looked at students who broke the 2 hour limit and had a GPA between 2.0 and 3.0	317/337 = 95% of students who made requests who had a GPA between 2.0 and 3.0 broke the 2 hour limit rule! these students care less about their academics and spend their time doing frivolous things and breaking our service.
SELECT avg(GPA) FROM student_rutgers s, parkedTimeTable p where (TIME(TimeEntered) between 'time1' and 'time2') and s.id=p.parkedruid	We look at the average GPA for students who park in a certain time interval of the day, particularly at academic times.	Some significant results shown below followed by explanation. Associated members of data are highlighted in the same color.

Time of Day	Average GPA	Associated Campus
10:15-10:25 AM	***3.4410***	***Livingston/Busch***
10:25-10:35 AM	***2.2740***	***Livingston/Busch***
11:55 AM-12:05 PM	3.4219	***Livingston/Busch***
12:05-12:15 PM	2.4031	***Livingston/Busch***
1:35-1:45 PM	3.4073	***Livingston/Busch***
1:45-1:55 PM	2.3836	***Livingston/Busch***
3:15-3:25 PM	3.4192	***Livingston/Busch***
3:25-3:35 PM	2.2073	***Livingston/Busch***
4:20-4:30 PM	3.1170	***College Avenue***
4:30-4:40 PM	2.0242	***College Avenue***
12:20-12:35 PM	3.4067	***Cook/Douglass***
12:35-12:50 PM	2.7235	***Cook/Douglass***

- The GPA of students who requested permits around the time class started (i.e. 11:55-12:05 in this case) was over a point higher than those who requested permits well after class had begun (i.e. 11:55-12:05 in this case).
    - 3.36 to 2.25 respectively
    - These results for class timings were consistent for all 5 campuses
- The results indicate students with lower GPAs are later to class
    - They are later to class probably because they are worse students and because they show up late end up with a lack of space in their assigned lots and need to use our emergency temporary parking service.

Campus

- There was a high concentration of requests around the timings of the start of classes on each campus.
    - Ex. Classes start on Livingston and Busch at 12:00 PM
    - There were 168 requests through the semester in the period from 11:55 AM to 12:15 PM on both Livingston and Busch.

        - 30% of requests occurred around 2:50 PM

Ex. SELECT * from student_rutgers s, parkedTimeTable p where campus='Livingston' and s.id=p.parkedruid and Time(parkedTimeE) between '11:55' and '12:15'	We look at the concentration of students who park in a certain time interval of the day, particularly at academic times. We varied the campus name and timings to obtain the following results:	Significant results shown below followed by explanation.

- Request Breakdown
    - Nearly half of requests for Livingston
        - 20% of requests occurred around 12:00 PM
        - 30% of requests occurred around 1:40 PM
        - 30% of requests occurred around 3:20 PM
    - About 20% for Busch/Douglass
        - 25% of requests occurred around 12:00 PM
        - 20% of requests occurred around 1:40 PM
        - 20% of requests occurred around 3:20 PM
    - 20% Douglass
        - 25% of requests occurred around 12:35 PM
        - 25% of requests occurred around 2:15 PM
        - 15% of requests occurred around 3:55 PM
    - 10% College Avenue

- 20% of requests occurred around 9:50 PM
- 20% of requests occurred around 11:30 PM

Cars

Query	Explanation	Results
SELECT * FROM student_rutgers s, parkedTimeTable p WHERE s.id=p.parkedruid AND (TimeDiff(Time(parkedtimeD),Time(parkedtimeE)) >'02:00:00') AND (manufac='Audi' OR manufac='BMW' OR manufac='Mercedes')	Selects students who broke the 2 hour limit and own a luxury car (Audi, BMW, or Mercedes)	171/175 ~98% of luxury car owners who made requests broke the 2 hour limit rule! These rich students likely do not mind paying parking tickets. They averaged 2:41:18 in time elapsed from time entered to departure.
Same query, Volvo, Jeep, Subaru, Hyundai	The same query but with the car brands listed left.	We found these owners were the best – they took only 1:01:54 per request to use our service. Only 77/260 ~ 30% of requests went over the 2 hour limit!

Revenue Generation

We frequently discuss the two hour limit in the slideshow and this document, which is how long users of a temporary parking pass can park in a lot. This was the analytics behind the revenue generation.

We saw from the first query listed in the document that 744/1269=58.63% of students violated the two hour limit, giving Rutgers the authority to fine them a $25 ticket. The actual size of the student body is 30,000 students and we found approximately over 30% have a car on campus or commute, which amounts to about 10,000 students. $30 for the temporary permit program imposed on every student who buys a Rutgers permit is $30*$10,000=$300,000. Given, taking the under that about 50% will try to abuse the system and use more time than they are allotted, if Rutgers were to ticket all of them, they would collect $125,000 more in revenue and generate $850,000 a year.

Dynamic Pricing Model

The dynamic pricing model looks at the attributes that contributed most to the rule breaking (or not) of the two hour rule and assigns values based on the extremity of the rule break. Unfortunately this algorithm is proprietary but we look forward to sharing it should Rutgers do business with RU Lugged.