

GROUP 3

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An analysis of calls to a taxi company

Individual Report :: ALEX MILLER

The system we analysed was the call centre for a Wellington based taxi company.

The call centre receives all sorts of calls. Not all taxi requests are equal. The full model for this system would have multiple arrival streams and multiple queues. Service would have multiple stages of service.

They were unwilling to disclose their full process so we were given data that represented the system as having a single service stage.

Each call had an arrival time, seconds in queue and seconds until completion.

**My actions in the project are as follows:**

Leadership

I was nominated as the leader (also being the class rep). I tried to distribute work appropriately and lead by example, doing good work and finishing quickly. I will consider the effectiveness of my leadership later.

Data analysis

- I used Python to plot the raw data as a time series. This allowed us to identify fluctuations in the system's characteristics.
- I did a regression on the time of day each call was received. The results confirmed that time of day was statistically significant in determining the inter-arrival time.
- Daniel and I worked together to find the most consistent period of the data. I used R to produce the information that informed our decisions.
- Daniel and I also identified and removed outliers from the data. I used R for these decision statistics. We removed calls that were so long that we didn't think they were taxi requests. We identified them using the statistical convention of 3 standard deviations.
- I used R to manipulate the data (after Daniel and Adam had used Python to import it, and made it usable) and produce the final dataset.
- Daniel and I found the distribution of this dataset. I used R to produce graphical and statistical output that guided our decisions.
- I wrote about our results in the report on data analysis.

Simulation of the empirical distribution

For our three simulations of the system I chose to do the empirical model.

- I used R to generate the empirical distribution's density table.
- I used Python to turn that table into a function. Then I simulated the empirical distribution.
- Having completed our simulations, I wrote the section at the end of that report analysing our results.

**The things I enjoyed about the project were:**

Real learning:

It was fun (and challenging) to have so much discretion in choosing the topic of our project. The project we chose allowed use to skills we had learned elsewhere.

Application of a variety of skills from other courses:

I learned R through statistics. Having more opportunity to work in R was fun. The topic and data presented some unique challenges. It was a great indirect learning opportunity.

Working in a group:

I like working with others. Situations like these give me opportunities to garner the knowledge of my peers.

**The biggest difficulties I encountered:**

Leadership:

This project made me aware of the shortcomings of my leadership. I struggled to effectively engage the whole group. The differing skills of the group made work allocation hard. I know that my decisions meant that sometimes my peers were unable to contribute effectively.

My work process relies on proofreading. I would check the work of others and correct it as I saw fit. This behaviour might have damaged our project by putting my peers in positions that they weren't comfortable with, and probably suppressed further contributions. This is just an assignment, and youth and inexperience count for more than intention, but I still consider this a failure of my leadership.

**The things I would most like to change in our current project:**

My leadership.

**The things I would change if we did a new project:**

Although I enjoyed using digitally sourced data initially it was a headache. We received our data much later than other groups. My determinedness could have seriously handicapped our work. We (I) should have been more vigilant in managing that stage, and prepared alternatives more quickly.

**My thoughts on the project as an assignment are:**

- It is adequately difficult.
- It is sufficiently well managed to allow students plenty of time to complete deliverables.
- It is well structured, and each student should be capable of contributing at each stage.

**A potential change:**

In INFO320 we had to do analysis of a system for a real company. One of the challenges of that was working for and with customers. That element is missing from this project.

I think client engagement (aka direct supervision) allows students to improve faster. The feedback we received in INFO320 was hard and fast. If they didn't understand we had to educate them. If our results weren't sufficient we had to work harder.

Honours has client engagement and more complex theory. Less students gives the supervisors more time. It is unreasonable to expect that level of engagement from a 300 level course, but perhaps some element of it can be introduced.

- Initial presentation to the class, outlining the project and the plan.
- Groups engaging more over their recommendations.

