My title*

My subtitle if needed

First author Another author

March 12, 2024

First sentence. Second sentence. Third sentence. Fourth sentence.

1 Introduction

2 Data

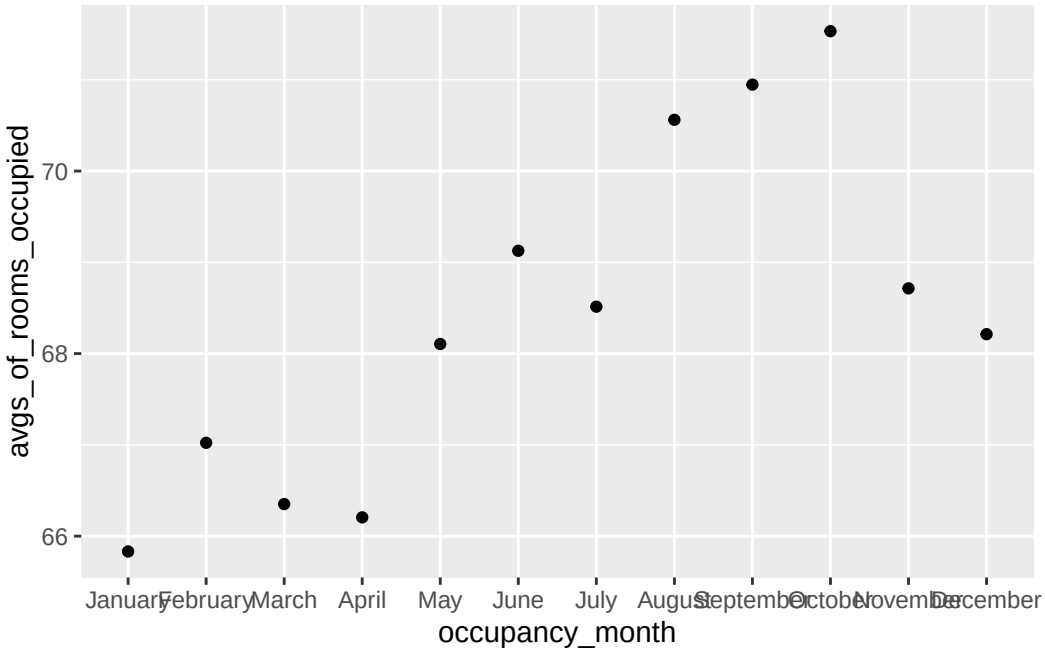


Figure 1: Toronto shelter rooms average usage in 2022

*Code and data are available at: LINK.

Table 1: Shelter usage in Toronto in 2022

Month	Avg daily occupied rooms
January	65.8
February	67.0
March	66.4
April	66.2
May	68.1
June	69.1
July	68.5
August	70.6
September	70.9
October	71.5
November	68.7
December	68.2

Figure 2: The shelter rooms usage based on different sector and city in Toronto

Talk more about it.

(You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

Talk way more about it.

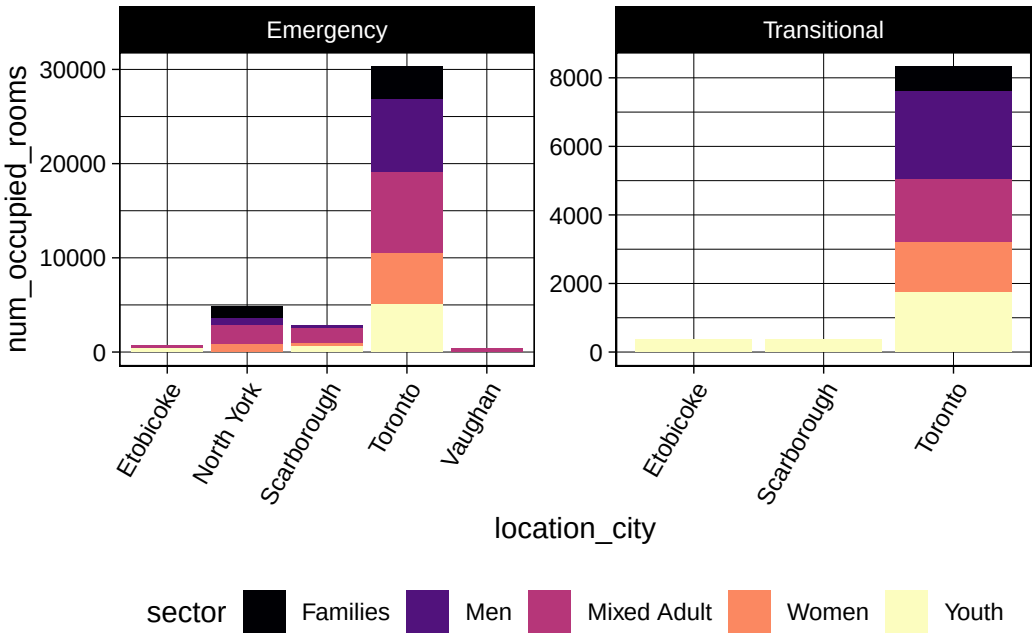


Figure 3: The shelter rooms usage based on different sector and services program inn Toronto.

3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in.

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i|\mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$
$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$
$$\sigma \sim \text{Exponential}(1) \tag{6}$$

3.1.1 Model justification

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance θ.

4 Results

Our results are summarized in Table 2.

```
Priors for model 'toronto_shelters_data_first_model_rstanarm'
------
Intercept (after predictors centered)
 ~ normal(location = 0, scale = 2.5)

Coefficients
 ~ normal(location = [0,0], scale = [2.5,2.5])

Auxiliary (sigma)
 ~ exponential(rate = 1)
------
See help('prior_summary.stanreg') for more details
```

5 Discussion

5.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

5.2 Second discussion point

5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

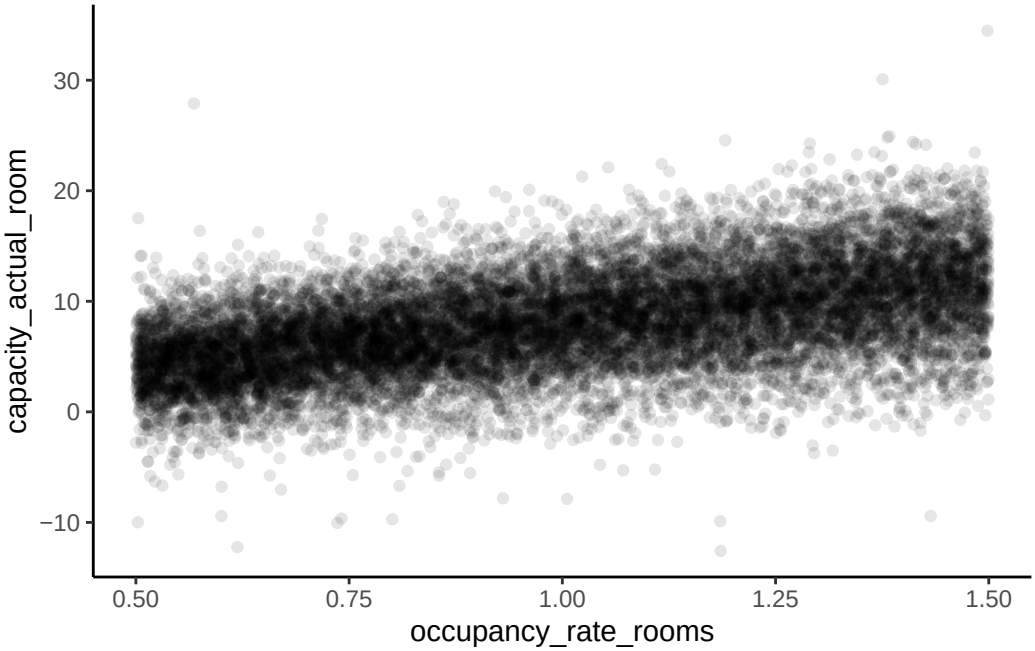


Figure 4: The relationship between the occupancy rate and actual room occupied.

Table 2: Explanatory models of Toronto's shelters usage based on occupancy rate and service user count

	(1)
(Intercept)	11.556
occupancy_rate_rooms	−0.471
service_user_count	0.558
Num.Obs.	337
R2	0.430
R2 Adj.	0.078
Log.Lik.	−1886.786
ELPD	−1890.1
ELPD s.e.	13.5
LOOIC	3780.2
LOOIC s.e.	27.0
WAIC	3780.1
RMSE	65.07

Appendix

A Additional data details

B Model details

B.1 Posterior predictive check

we implement a posterior predictive check. This shows... we compare the posterior with the prior. This shows...

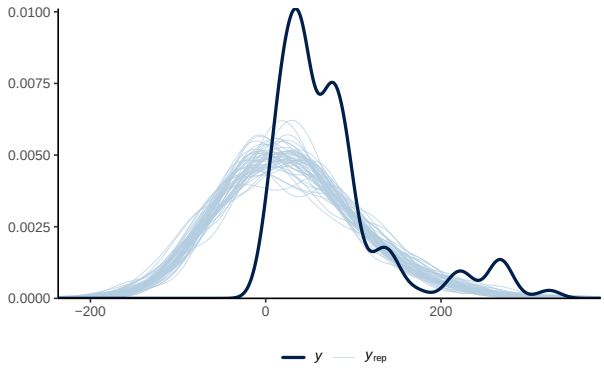
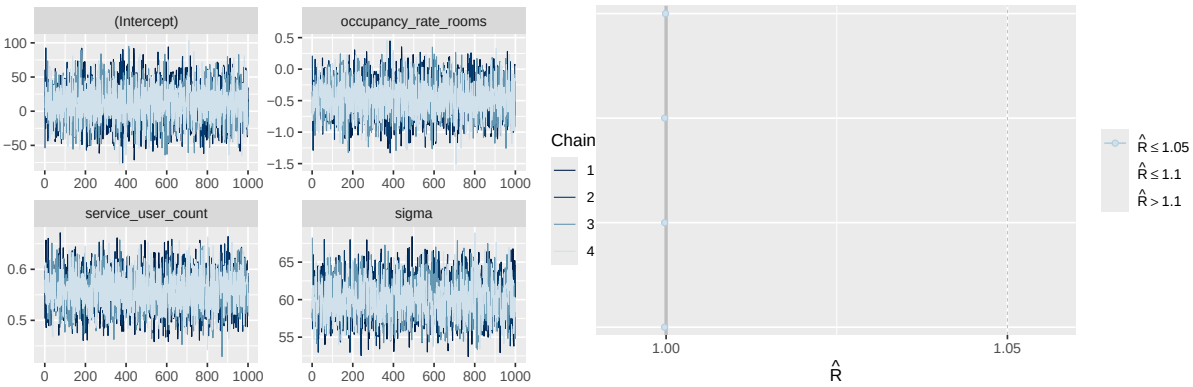


Figure 5: Examining how the model fits, and is affected by, the data

B.2 Diagnostics

is a trace plot. It shows... This suggests...

is a Rhat plot. It shows... This suggests...



(a) Trace plot (b) Rhat plot

Figure 6: Checking the convergence of the MCMC algorithm

C References