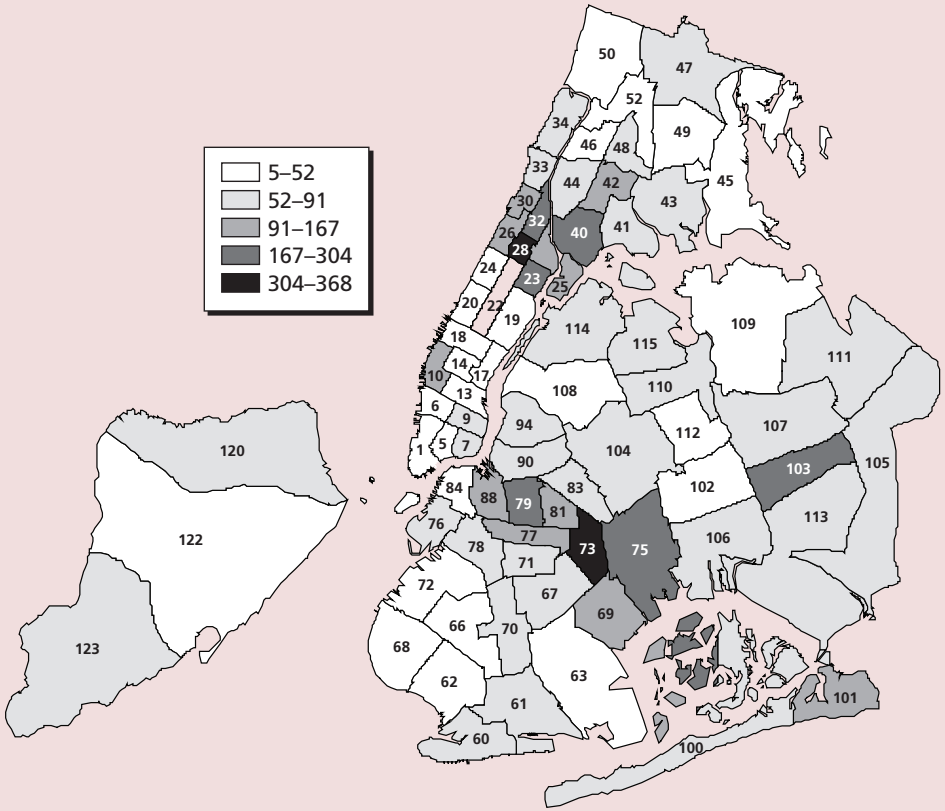
Introduction

Why Bayesian analysis?

Figure 2.1
Stops per 1,000 People (estimated daytime population)



SOURCE: Number of stops computed from NYPD (2006). Daytime population figures are from the New York City Planning Department as reported in Spitzer (1999, Appendix I).

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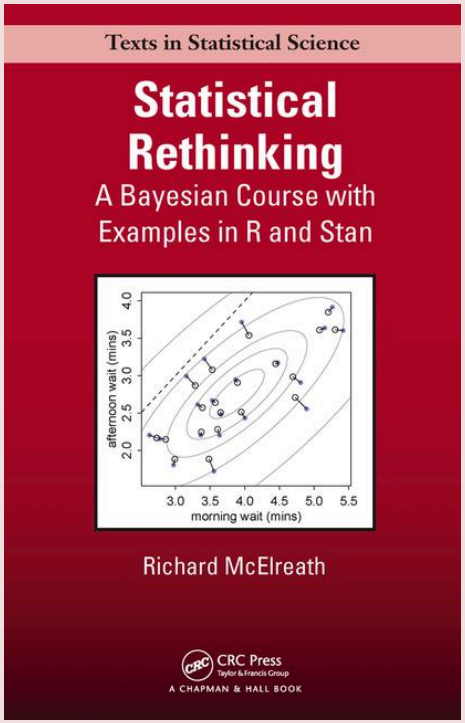
Course book:

- Good book.
- Non mathematical, focus on interpretation and modeling.
- Lecture videos, and lecture notes available from the homepage.



Homepage:http://xcelab.net/rm/statistical-rethinking/

This is the, approximate, schedule of the course:

Week	Chapters (parts)	Learning
1	2,3	Bayesian ideas, sampling
2	4,5	Normal distribution, linear regression
3	6,7	model comparison, model interactions
4	9	RStan, generalized linear models
5	8	Markov chain Monte carlo (MCMC)
6	12	Multilevel model
7	.	Some semi real applications

Homepage of the course:
https://github.com/JonasWallin/BayesianMethods_STAE02_2018
and Live@Lund

There grading of the course will relay on two parts:

- 60% of the grading are from the three labs. To pass you must have successfully completed the mandatory parts of the labs.
- 40% of the grading comes from individual project.

To pass the course you must pass both.

The first lab will be about:

- Basic use of R.
- Basic sampling to solve integrals.
- Basic Bayesian calculations.

On the homepage there are links to tutorials of both R and Rstudio. If you are uncertain do them.

The second lab will be about:

- Handling multivariate distributions, marginal distribution and conditional distributions.
- Linear regression in a Bayesian setting.
- Model comparison.

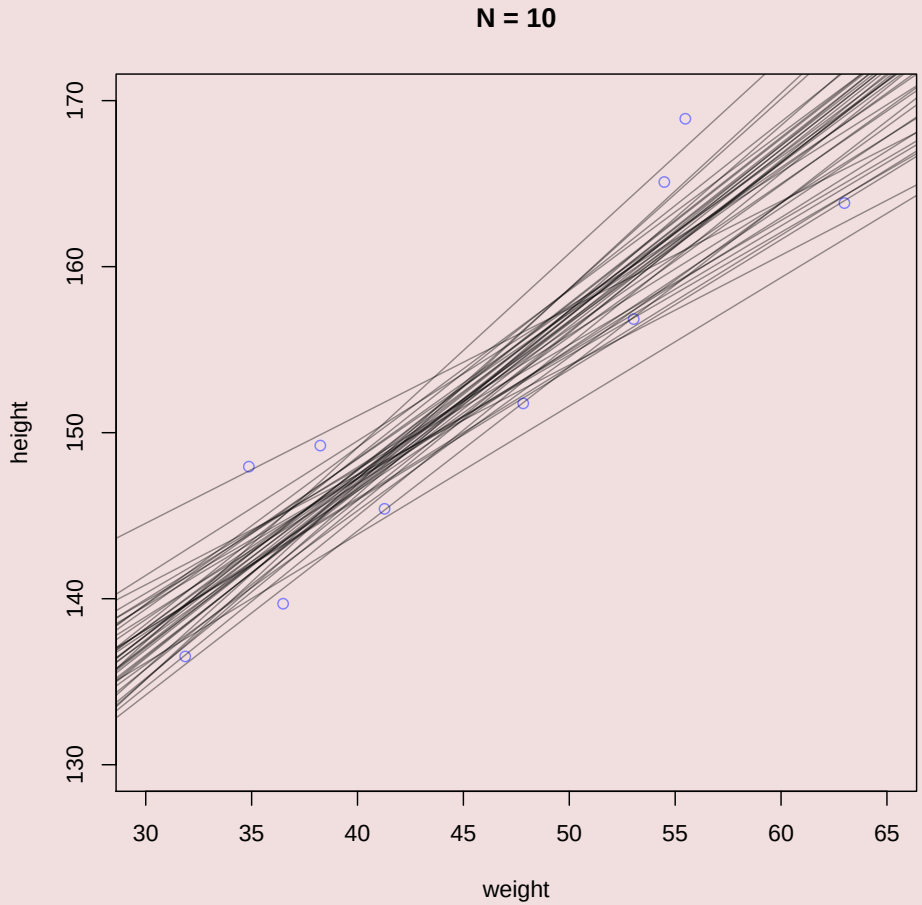


Figure: Posterior functions $\mu_i(x)$

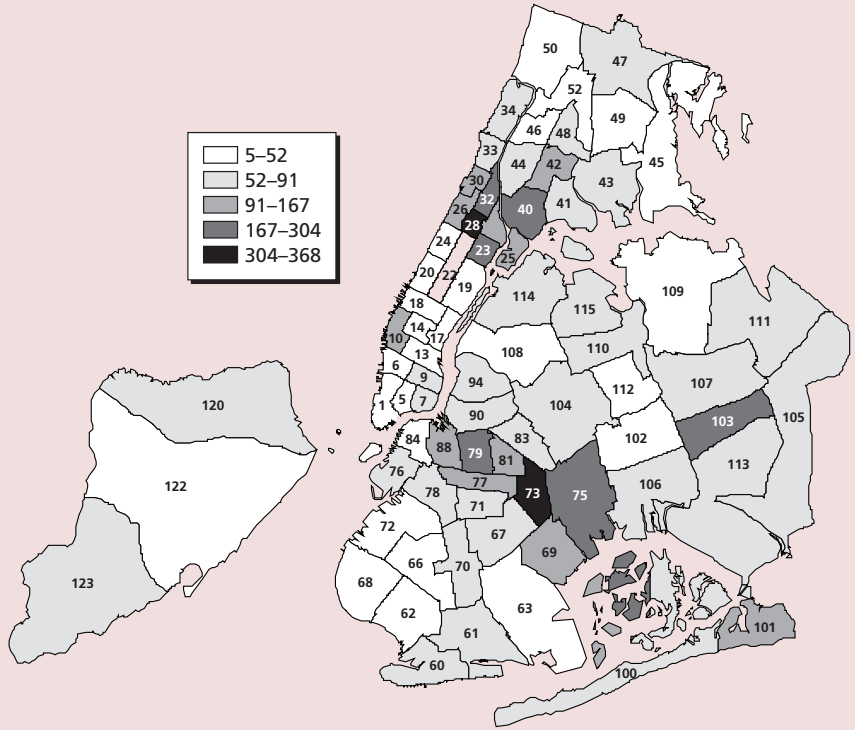
The third lab will be about:

- Coding with Rstan.
- Bayesian model beyond the Normal model (linear model).
- More advanced Bayesian models: Mixture models, Multilevel models.

Single author project:

- Find a data sets.
- Build a Bayesian model.
- Interpretation the model using Rstan.

Figure 2.1
Stops per 1,000 People (estimated daytime population)



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