STT 465 (Fall, 2015): Bayesian Statistical Methods

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⇒ Office Hours: Mostly by appointment

⇒ Course website: https://github.com/gdlc/stt465

⇒ Syllabus: see course website for info about the course, pre-requisites, grading, etc.

⇒ Pre-requisites, rules, exams & grading policy (see syllabus)

Tentative Schedule

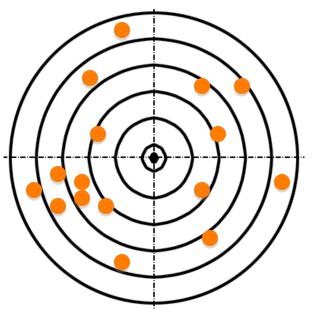| Week	Day	Date	Chapter	Events
Week 1	W	2-Sep	Ch. 1	1st class
	M	7-Sep		No class
Week 2	W	9-Sep	Ch. 2	
	M	14-Sep	Ch. 3	
	W	16-Sep		HW1 due
	M	21-Sep	Ch. 4	
Week 3	W	23-Sep		
	M	28-Sep	Ch. 5	
Week 4	W	30-Sep		HW2 due
	M	5-Oct	Ch. 6	
Week 5	W	7-Oct		
	M	12-Oct	Ch. 7	
Week 6	W	14-Oct		HW2 due
	M	19-Oct	Ch. 9	
Week 7	W	21-Oct		
	M	26-Oct		
Week 8	W	28-Oct		Midterm
	M	2-Nov	Ch. 10	
Week 9	W	4-Nov		Proposal due
	M	9-Nov	Ch. 12	
Week 10	W	11-Nov		
	M	16-Nov	Multivariate Mixed Models	
Week 11	W	18-Nov		
	M	23-Nov		
Week 12	W	25-Nov		Final project due
	M	30-Nov		
Week 13	W	2-Dec		
	M	7-Dec		
Week 14	W	9-Dec		Final project presentations
	M	14-Dec		Final project presentations
Week 15	W	16-Dec		

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Statistical Inference

⇒ Review of basic concepts:
  - Population
  - Sample
  - Estimator

⇒ Inference: we make statements about population parameters based on data.

⇒ Two approaches:

  - Classical (frequentist) inference: statements are based on the sampling distribution of the estimator over conceptual repeated sampling

  - Bayesian: statements are conditional on the observed data (the only sample we have drawn from the population).

⇒ Discuss the problem of estimating the mean of Y in a population.

Frequentist approach

$Model \quad \mathrm{p}\left(y\middle|\theta\right)$

$Sample \ Y_s = \left\{y_i\right\} \quad Estimator \ \ \hat{\theta}\left(Y_s\right)$

Sampling Distribution of Estimates

$$MSE\left(\hat{\theta}\right) = \left[E\left(\hat{\theta}\right) - \theta\right]^2 + E\left[\hat{\theta} - E\left(\hat{\theta}\right)\right]^2$$

Squared-Bias

Variance

Bias-Variance Tradeoffs