

LECTURE 21: SUMMARY

STAT 598Z: INTRODUCTION TO COMPUTING FOR STATISTICS

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We looked at:

- Basics of R programming
 - Data structures
 - Control structures
 - Functions

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- Slightly more advanced topics
 - plotting with `ggplot`
 - Object oriented programming
 - regular expressions
 - Data manipulation with `tidyverse`

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 - Control structures
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 - plotting with `ggplot`
 - Object oriented programming
 - regular expressions
 - Data manipulation with `tidyverse`
- Some computational ideas
 - Crossvalidation
 - Ridge regression and LASSO
 - Monte Carlo

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- Interfacing with c
- Parallel computing
- Writing your own packages

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Also, confident to teach yourself other languages

- python
- Matlab
- scala/julia/other more exotic languages
- C

A more algorithmic course on computational statistics

- Optimizing parameters with missing variables (EM algorithm)
- Dealing with hidden variables for structured problems
 - Baum-Welch algorithm for hidden Markov models
 - Kalman-filtering
- More Monte Carlo and MCMC, especially in the context of Bayesian computation
- More optimization algorithms
- Loss functions beyond LASSO

Submit a 4-8 page report detailing

- What you wanted to do
- What you did
- Some results and nice plots
- What you couldn't do (and why)
- What you learnt

Don't include code in your report (submit separately)