Course overview

(AST230) R for Data Science
Md Rasel Biswas

Instructor

Md Rasel Biswas

MS & BS in Applied Statistics (DU)

Lecturer at DU since July 2022

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Course introduction

In the modern world, proficiency in software is a crucial skill. This course introduces students to R, an extremely powerful programming language for statistical computing and graphics generation. In this course, students will learn how to manipulate data, perform basic statistical analyses, and visualize results using R.

Course objectives

Upon completing this course, students will have developed a foundational understanding of the R programming language. Specifically, students will be able to:

- Work with various types of R objects,

- Read and write data in different formats,

- Apply basic programming tools in R,

- Write and utilize functions for data manipulation, and

- Create and customize various types of plots for data visualization.

Lecture plans

Lecture 1- 7: (Base R) Introduction to R and RStudio, R objects, basic R operations, data types in R, working with vectors, writing custom R functions, data structures (e.g. lists, data frames, etc.), subsetting R objects, control flow (choices and loops), summarising data frames, generating random samples.

Lecture 8-14: (tidyverse) Data science workflow, importing data into R, data wrangling with `dplyr`, verbs of `dplyr`, reshaping data, handling missing data, joining datasets, summarising data.

Lecture 15-20: (Visualization) Base R plot functions (histogram, boxplot, scatter plot, bar chart), Data vizualization with `ggplot2` (layered grammar of graphics, univariate and bivariate plot functions)

Textbooks

1. R for Data Science (2e) (Wickham et al., 2023)

2. An Introduction to R (Alex Douglas, 2024)

Reference books

1. Advanced R (Wickham, 2019)

Lecture time

Every Tuesday 1:45 PM – 3:05 PM at ISRT Computer Lab 1 (Room 403)

Assessment

- Attendance: 5%

- Assignments: 5%

- Incourse exams: 30%

- Final exam: 60%

References

Alex Douglas, F. M., Deon Roos. (2024). *An introduction to r*. https://intro2r.com/.

Wickham, H. (2019). *Advanced r, second edition* (2nd ed.). Chapman & Hall/CRC.

Wickham, H., Mine Cetinkaya-Rundel, & Grolemund, G. (2023). *R for data science* (2nd ed.). O'Reilly Media.