Introduction to Programming in R

Syllabus

This course introduces the R statistical software to students with minimal prior exposure to programming. The course aims to prepare students to carryout a data analysis and to write simple functions. The focus is on the computational model that underlies the R language with the goal of providing a foundation for further coding. Topics include data types and structures, such as vectors, data frames and lists; the REPL evaluation model; function calls, argument matching; writing simple functions and control flow. Tools for reading, analyzing, and plotting data are also covered, such as data input/output, the formula language, and graphics.

**Lecture**: 1 hour a week

**Lab**: 1 hour a week in groups of 30

**Course requirements**

* participation 10%;
* 7 lab assignments total: 30%;
* 4 quizzes, total: 20%;
* 7 Homework total: 30%;
* final assessment: 10%.

**Textbook:** *Computational Reasoning in R* by Nolan (N) – online at [www.stat.berkeley.edu/users/nolan/IntroRPgm](http://www.stat.berkeley.edu/users/nolan/IntroRPgm)

**Participation:** Each class there will be an attendance question. You receive full credit for attending 10 of the 14 class meetings.

**Labs:** Each week there will be a lab assignment or a quiz during lab session. Your lowest lab score will be dropped. Your lowest quiz score will be dropped.

**Homework:** There will be 7 homework assignments. Your lowest homework score will be dropped. These HW assignments are a review of the concepts covered in class and lab.

**Final Assessment:** There will be a short final exam.

## Schedule

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| **Wk** | **Topic** | **Reading** | **Lab/Quiz** | **HW Due** |
| 1 | REPL model & Call expressions | Ch 1 & 2 | Install R |  |
| 2 | Data types and vectors | Ch 3 | Lab #1 | HW #1 |
| 3 | Data frames & reading text files | Ch 4 & 5 | Quiz #1 |  |
| 4 | Graphics - ggplot | Ch 6 | Lab #2 | HW #2 |
| 5 | Graphics - ggplot | Ch 6 | Lab #3 |  |
| 6 | Reshaping data |  | Quiz #2 | HW #3 |
| 7 | Reshaping data |  | Lab #4 |  |
| 8 | Other data structures & subsets |  | Lab #5 | HW #4 |
| 9 | Writing simple functions |  | Quiz #3 |  |
| 10 | Conditionally invoking code |  | Lab #6 | HW #5 |
| 11 | Iterative evaluation of code |  | Lab #7 |  |
| 12 | Formula language |  | Quiz #4 | HW #6 |
| 13 | Case Study |  |  | HW #7 |