

Demography 213

Simulating population: Arrays, for() loops, matrix multiplication and some plotting.

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Abstract

This week’s adventure consists of a small population simulation, and a couple of simple yet profound questions about the workings of R and population dynamics. Of course, we will also continue gaining efficiency with R studio.

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1 Introduction

The purpose of this exercise is gain some greater facility with the R(studio) environment while at the same time pursuing a profound demographic truth – and picking up some graphics tricks. The `demonstration.r` file this week consists of some code that will create a classic kind of demographic simulation and then draw some graphs. The graphic bits are contained in a separate `demonstration-graphics.R` file Your job will be to work through both files and then create a smaller stream lined version which borrows from both and which you will then use to ”prove” a big truth about how *Leslie Matrix* population projections behave.

While a certain amount of confusion is to be expected, everything will be much less confusing if **before Wednesday**, you

1. Read the rest of this document.
2. **review** the material in Chapter 3, the first half of Chapter 5, and the first two pages of Chapter 6 of *Introduction to R*. (You can find it on the course website <http://courses.demog.berkeley.edu/mason213>).
3. **Chapter 4 of *R In Action*** (“Basic Data Management”) could also prove useful.

2. “.” (two dots) substitutes for the *parent* directory of the current working directory. `cd ..` “moves you” to the parent directory, but which I mean, the parent of the current working directory becomes the current working directory. The metacharacter works because each directory has *exactly one* parent directory.

2.1.4 Start a new Rstudio project in the directory appropriate for this week’s adventure

As always, start a new week’s assignment in a new, but previously created, and cleverly named directory. Cd into your carefully chosen directory and copy into it the file:

```
~carlm/213/LeslieSimulation/demonstration.r
```

Then launch Rstudio **in a browser** and take whatever steps are necessary to make sure your 213/WeekN directory is an Rstudio *project*. e.g. create a new “project” as we did last week (making sure that the new directory for the current week is where the new project lives.

2.2 Work through the program in the source pane and ANSWER ALL THE QUESTIONS you find there

Once you have launched Rstudio and made WeekN your project, you should be able to simply click on the `demonstration.r` file (that you recently copied into that directory) and thereby load it into your source pane.

As usual, the `demonstration.r` file contains several questions all of which are written as valid R comments. ANSWER each question **in your source pane** make sure that your answer is also written as a valid comment so that *everything in the demonstration.r file is either a comment or a valid and intentional R statement*. Please also indicate your answers with a word “ANSWER” so that that I can find them easily.

When you are finished, please send email to cmason@berkeley.edu indentifying one thing about this exercise that you found worthy of emailing your instructor about.