Introduction to the R software for ecologists

Lesson plan

Instructor: Grant Falvo <falvogra@msu.edu>

Module 1:
- Using R as a calculator
- Storing values in objects
- Querying object characteristics
- Working with dataframes
- Using pre-built functions
- Building and using custom functions
- Using If/Else statements
- Using For Loops
- Group Activity:
  - Create a script that:
    - Creates a dataframe that represents a deck of cards
    - Creates functions that simulate the game of Blackjack

Module 2:
- Loading and cleaning datasets
- Data wrangling and manipulation with Dplyr
- Creating summarized datasets with Dplyr
- Outputting manipulated datasets
- Basic linear modeling and statistical analysis
  - Learning R's syntax for constructing and evaluating simple linear models
- Group Activity:
  - Create a script that:
    - Loads, cleans, and outputs the KBS Resource Gradient Yield Data
    - Constructs linear model for Yield~Crop+Fertilizer+Irrigation
    - Evaluates linear model

Module 3:
- Producing interpretable figures
- Base R and ggplot basics:
  - Learn R's syntax for scatter, box, histogram, bar plots.
- Intermediate ggplot features:
  - Color, fill and facet by group
  - Custom theme aesthetics, including legends, titles, fonts, etc.
- Group Activity:
  - Wrangling, cleaning, and merging your own dataset with KBS data

- Visit https://lter.kbs.msu.edu/datatables and find a datatable that you would like to process.
- Pull the data onto your computer, clean it, computer your statistic of interest, and produce a final figure.
- **Complete post workshop survey (link)**