Basics of R

Data import and manipulation, graphs, functions, modeling

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Assignments

Tuesday, 7 May

1. **Write a script to manipulate studyOneCleanData**

   Start with the ascii table of data
   Import into a dataframe
   Mean and SD of columns
   Add a new column for average of high and low temperature
   Graph Tempo vs. Mid-temperature
   Save graph as pdf
   Save the new data.frame as R object
   Export the new table as tab-delimited ascii

2. **Write a script to manipulate study3Opera**

   Start with the ascii table of data
   Import into a dataframe
   Mean and SD of columns
   Mean authority for males vs. females
   Mean tessitura for males vs. females
   Graph tessitura vs. age, different colored points for males and females
   Save graph as pdf

Wednesday, 8 May

1. **Regression: —— data**

   Possible terms

a) simple model: log(AGB) vs. log(dbh)
b) second order term: log(dbh) squared
c) rainfall and elevation

Graph

a) log(AGB) vs. log(dbh)
b) add curve of best fit
c) overlay curves for high rainfall and low rainfall

Character variable (factors)

a) use ForestType in the model
   - $\log(volume) \sim \log(dbh) + ForestType$
b) compare to 3 independent models (3 forest types)
   - $\log(volume[dry]) \sim \log(dbh[dry])$
   - etc.

Save a graph

Thursday, 9 May

1. **Write a function to do regression, draw graph, add line**
   a) Arguments x, y
   b) Save graph
   c) Loop through several x variables
2. **Write a function with a loop**
   a)
   b)

Friday, 10 May

1. **Use lmer for regression of logagb on logdbh with species and forest type as factors**
   a) Include squared term for logdbh
   b) Add locality as a group effect (does it change the fixed effect)
   c) Test forest type as fixed effect and as group effect
   d) Graph points and lines
   e) Compare alternative models
2. **Use lmer for regression of pup Wt on momcat with year as a mixed effect**
   a) Variable intercept, slope, or both
   b) Graph all points
   c) Use xyplot for groups (Lattice)
   d) Overlay lines of all random effects
   e) Compare alternative models
3. **Use lmer for regression of log(ht) on log(dbh) with species as a mixed effect**