R Lecture 0 Wednesday, January 22, 2020 

4 present

[R in Jupyter Notebooks](https://docs.anaconda.com/anaconda/navigator/tutorials/r-lang/)

[R Wiki Page](https://en.wikipedia.org/wiki/R_(programming_language))

According to Wiki: 15,000+ packages in

* [CRAN](https://cran.r-project.org/) – Comprehensive R Archive Network – 4.6 x 107 results
* [Bioconductor](https://www.bioconductor.org/) – Open Src S/W for BINF – 1.5 x 106 results
* [Omegahat](http://www.omegahat.net/) - Project for Stat Comp. – 2.6 x 104 results
* [Github R](https://github.com/trending/r) – Trending R Repositories – 3.0 x 108 results

Wide Variety of Statistical and Genomics Packages

Lecture and Syllabus Posted on [UALR Blackboard](https://blackboard.ualr.edu/webapps/blackboard/content/listContent.jsp?course_id=_96041_1&content_id=_2280693_1&mode=reset)

R Syntax: Conditionals, Loops, Functions – Exam 1

ggplot: Publication Quality Figures – Exam 2

machine learning:

Exams are:

* closed book
* multiple choice
* based on H/W

Class Time Changed to 3:00 – 4:15 PM  
Location TBD

Mary Yang:  
Office EIT 303  
Office Hours 2-3 pm T-R

Books are:

* [R for Data Science](https://www.amazon.com/Data-Science-Transform-Visualize-Model/dp/1491910399/ref=sr_1_3?keywords=%E2%80%A2+R+for+Data+Science&qid=1579719816&sr=8-3) by Hadley Wickham, Garrett, Grolemund
* [The Art of R Programming](https://www.amazon.com/Art-Programming-Statistical-Software-Design/dp/1593273843/ref=sr_1_1?keywords=%E2%80%A2+the+art+of+r+programming+by+norman+matloff&qid=1579719866&sr=8-1) by Norman Matolff
* [Machine Learning with R](https://www.amazon.com/Machine-Learning-techniques-predictive-modeling/dp/1788295862/ref=sr_1_3?keywords=Machine+Learning+with+R+by+Brett+Lantz&qid=1579719903&sr=8-3) by Brett Lantz
* [R Graphics Cookboo](https://www.amazon.com/Graphics-Cookbook-Practical-Recipes-Visualizing/dp/1491978600/ref=sr_1_1?keywords=r+graphics+cookbook+by+winston+chang&qid=1579719958&sr=8-1)k by Winton Chang

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Some version divergence in old and new versions of R   
[RStudio 1.2](https://rstudio.com/products/rstudio/download/#download) won't run < MacOS 12 but [RStudio 1.1](https://support.rstudio.com/hc/en-us/articles/206569407-Older-Versions-of-RStudio) will.  
Installed old on the laptop and new on the desktop.

R in Jupyter Notebooks is OK.  
So I will build an R project in Jupyter  
and try looking at its environment in RStudio,  
kinda like vi versus Netbeans.

Installed R Jupyter and RStudio on  
both machines. Works great so far.  
That’s four installations - a bit of maintenance.

Three styles of code execution:

* Line
* Selected Region
* Entire Document

Exporting Images From Jupyter  
Exporting Images From RStudio

Facilitating Group Collaboration

Read Data From File:

* .csv Comma Separated Values
* .txt File
* .xls .xlsx, .xla Excel Files

Write/Save Data To File:

* See Example Runs
* Load Source to See Previous Sessions
* .RData is suffix to save session file

R Types: Integer, Numeric, Logical, Character

R Structure: Vector, Matrix, Array, List, Data frame

* Vector, Matrix, Array are Homogeneous
* List, Data frame can be Heterogeneous

Cleaning Data with na.rm and na.omit

Including libraries like ggplot with each session

Questions:

* How to check version?
* How to install from CRAN, in Jupyter and RStudio?
* Does environment in RStudio show proper package versions?

Unix-Like Commands:

* ls() and rm(obj) work within the scope of R itself
* setwd(), getwd(), dir() and dir.create() affect OS state
* !cd, !pwd, !mkdir are Jupyter notebook equivalents

Multiple libraries accessible from Bioconductor

* Including OMIM, PUBMED:

Extra Programming Hints on R Data Camp

Codify today's work as a web page for quick access.

Nick Trick: Cross Compare Two Datasets