IAM3 R Workshop Overview

Workshop Schedule: *June 12th – June 17th* (basic | *extra*)

Time	AM	PM	Monday **June 12th**	Tuesday **June 13th**	Wednesday **June 14th**	Thursday **June 15th**	Friday **June 16th**	Saturday **June 17th**
15m		**14:00**		Review				R Clinic
45m		**14:15 | 15:00**		Slides 1: R Basics				
10m	**10:00 | 10:10**	**15:00 | 15:10**		Break	Review	Review	Review	
30m	**10:10 | 10:40**	**15:10 | 15:40**	Slides 1: Why Use R?	Lab 1: R Basics	Slides 1: Manipulate Data using Tidyverse	Slides 1: Tidy and Wrangle Data	Slides 1: Summarize and Report Data	
5m	**10:40**	**15:40**	Break	Break	Break	Break	Break	
20m	**10:45 | 11:05**	**15:45 | 16:05**	Slides 2: R Env & RStudio	Slides 2: Data Viz / *Slides 3: Adv. Viz*	Lab 1	Lab 1	Lab 1	
5m	**11:05**	**16:05**	Break	Break	Break	Break	Break	
20m	**11:10 | 11:30**	**16:10 | 16:30**	Slides 3 and Lab: Import Your Data	Lab 2: Viz / *Lab 3: Adv. Viz*	Review Lab / *Slides 2: Trans. Data*	Review Lab / *Slides 2: Manage Your Project*	Slides 2: Resources for Learning R	
30m	**11:30 | 12:00**	**16:30 | 17:00**	OYOLab	OYOLab	OYOLab	OYOLab	OYOLab	

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Learning Aims: *June 12th – June 17th* (basic | *extra*)

<table>
<tr><th colspan="2">June 12th (2 hours) – Introduction; Why Use R?; R Environment & Philosophy</th></tr>
<tr><td colspan="2">1. Understand the structure and features of the R environment (Base R, RStudio, packages).
2. Understand libraries and packages.
3. Know the “main tools of data science”: importing, tidying, transforming, and visualizing.[1]
4. Learn to write clean and understandable code.
5. Be convinced as to why you should use R for data analysis as opposed to Excel or SPSS ☺</td></tr>
<tr><th colspan="2">June 13th (3 hours) – Programming Basics; Visualize Data with ggplot2</th></tr>
<tr><td>1. Understand variable types such as character, integer, and factor.
2. Understand key data structures such as data frames (tibbles), lists, matrices, and vectors.
3. Know the “grammar of graphics” – plot object plus (+) layers
4. Understand aes() mappings and how to use them.</td><td>1. Be able to edit features of plots.
2. Be able to align multiple plots with each other.
3. Understand how to plot ERP data.
4. Know how to export plots.</td></tr>
<tr><th colspan="2">June 14th (2 hours) – Import and Transform Data</th></tr>
<tr><td>1. Know how to import data from Excel using readxl.
2. Understand the pipe.
3. Know the main Tidyverse functions and how to use them to rearrange, add, and rename variables (columns).
4. Be able to transform values and create new variables using mutate().</td><td>1. Know how vectors work and how they can be used in data analysis.
2. Know about %in%
3. Be able to use the conditional functions if_else() and case_when()
4. Be able to use the iterative functions for and apply/map
5. Know how to join dataframes</td></tr>
<tr><th colspan="2">June 15th (2 hours) – Tidy, Wrangle, and Manage Data</th></tr>
<tr><td>1. Be able to define “tidy tabular data” referring to variables, values, and observations.
2. Be able to use the functions pivot_wider() and pivot_longer() and know when they are useful.
3. Understand how to work with dates in R.
4. Understand missing values in R and how to work with them.
5. Know how to join data frames together.</td><td>1. Know how to organize the file structure of your project.
2. Understand .RProj files
3. Understand how to write code using local paths
4. Understand how to use functions for efficient coding & concise code.
5. Know how version control via GitHub can help with backing up and collaborating on projects.</td></tr>
<tr><th colspan="2">June 16th (2 hours) – Summarize and Report Data; Resources for Learning & Using R</th></tr>
<tr><td colspan="2">5. Know how to summarize data using group_by() and summarize().
1. Be able to build simple plots from summarized data.
2. Understand how familiar statistical tests are done in R and how to view their results.
3. Know how to use ChatGPT to code without writing code.
4. Get comfortable with troubleshooting issues in R via the Internet (stackexchange, R documentation).
5. Know resources available to continue learning R.</td></tr>
<tr><th colspan="2">June 17th (3 hours) – R Clinic</th></tr>
<tr><td colspan="2">1. Solve issues you are having with processing your data in R, with our help ☺</td></tr>
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IAM3 R Workshop Overview

On Your Own Labs (OYOLabs)

- The primary purpose of this workshop is to teach you the basics of R programming *and get you started on using R for your own research*.
- The hardest part of learning R is applying it to your own specific situation and your own data/projects.
- OYOLabs are meant for you to build your own workspace (or workspaces) with R so that you have a foundation to continue using R with your own projects after the Institute
    - You will have Brennan, Matt, and each other to help you work through the problems that will inevitably crop up!
- We encourage you to use the OYOLabs to work on your projects *as they relate to that day*. For example, on Tuesday (data visualization day!) you should try to write or refine scripts which visualize your data.
    - However, if you wish to try working on other aspects of your R project instead, use your time the best way you feel fit ☺