

What is R

- Open-source programming language environment
- Used especially for **statistical** computing and **graphics**
- Free
- Steep learning curve
- Progressive

Install R & Rstudio

1. For R, download from
<https://cran.r-project.org>
2. Then also download RStudio
from <https://rstudio.com>

Repository for this workshop

The screenshot shows a GitHub repository page. At the top, it displays the repository name 'profjamal / biostatistics' and a 'Code' button. Below the header, there are tabs for 'Code', 'Issues', 'Pull requests', 'Actions', 'Projects', 'Wiki', 'Security', 'Insights', and 'Settings'. The 'Code' tab is selected. It shows a main branch with 1 branch and 0 tags. There are 24 commits from the user 'profjamal'. The commits listed are:

| File | Commit Message | Time Ago |
|------------------------------|-------------------------|---------------|
| Basic Biostatistics 2022.pdf | Add files via upload | 8 hours ago |
| Biostatistics-with-R.pdf | Add files via upload | 3 hours ago |
| README.md | Create README.md | 15 months ago |
| healthstatus.csv | Update healthstatus.csv | 15 months ago |
| multivariate.csv | Add files via upload | 14 months ago |

Below the commits, there is a file named 'README.md' with the following content:

```
This is the repository for notes, scripts and data used for Biostatistics workshop.
```

- [https://github.com/profjamal
/biostatistics](https://github.com/profjamal/biostatistics)

The screenshot shows the RStudio interface with the title bar "Introduction to R - RStudio".

Console pane:

```
R version 4.0.3 (2020-10-10) -- "Bunny-Wunnies Freak Out"
Copyright (C) 2020 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin17.0 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
```

Environment pane:

Global Environment

Environment is empty

Files pane:

| Name | Size | Modified |
|-------------------------|-------|-----------------------|
| .. | | |
| Introduction to R.Rproj | 205 B | Dec 16, 2020, 9:45 PM |

Introduction to R - RStudio

Console Terminal Jobs Addins

R version 4.0.3 (2020-10-10) -- "Bunny-Wunnies Freak Out"
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Type 'q()' to quit R.

```
> object <- 1:20
> |
```

Environment History Connections Tutorial

Import Dataset Global Environment

Values

| object | int [1:20] | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | ... |
|--------|------------|---|---|---|---|---|---|---|---|----|-----|-----|
| object | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | ... | |

File Plots Packages Help Viewer

New Folder Delete Rename More

Events > ~Academic > Courses Conducted > Biostatistics Workshop > Biostatistics with R > Introduction to R

| Name | Size | Modified |
|-------------------------|-------|-----------------------|
| Introduction to R.Rproj | 205 B | Dec 16, 2020, 9:45 PM |

Data types (for each variable)

1. Character - similar like text in Excel
2. Numeric - any numbers including decimals
3. Integer - only accept whole number
4. Logical - TRUE, FALSE or NA
5. Complex - combination of data type
6. Date

Data structure (collection of variables)

1. Atomic vector
2. List
3. Matrix
4. Data frame
5. Factors

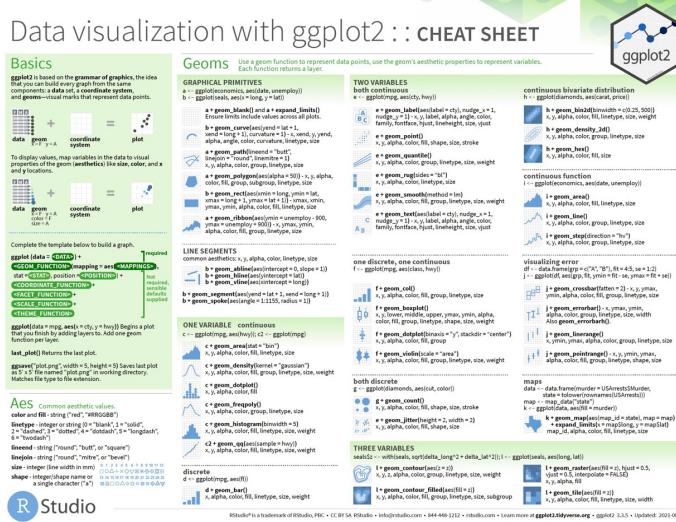
Starting R programming

- Google is your friend
- Set the working directory
- Packages can make or break you
- Practice, practice, practice



Recommended packages

- tidyverse, which contain
 1. dplyr
 2. ggplot2
 3. readr
 4. forcats
 5. stringr
 6. purrr
 7. tidyrr
 8. tibble
- ggpubar
- gtsummary
- psych
- car



Constant need to search for guide

- Read the package documentation
- <https://www.rdocumentation.org>
- Can download the cheat sheet
- <https://www.rstudio.com/resources/cheatsheets/>

Steps in statistics

1. Getting of data - import, or create
2. Examine the data - for errors, distribution
3. Analyse - descriptive & analytical
4. Interpret & conclude
5. Report

