EARN Talks

Preparing for Analysis with R: A guided tutorial for installing R and RStudio

July 29th, 2025, 2-3pm EST

The webinar/discussion will begin soon.

Meet today’s facilitators!

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Announcements

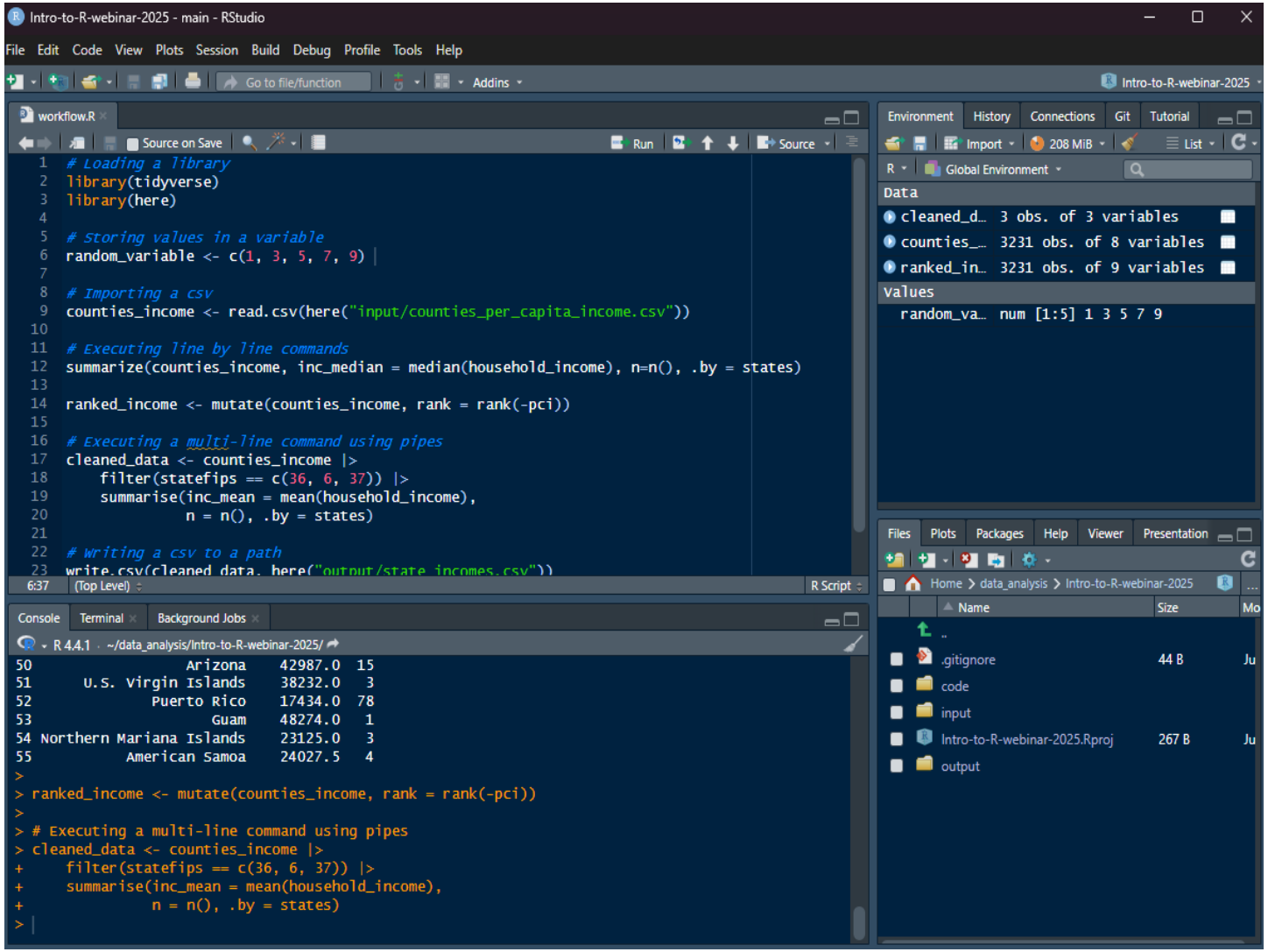
- Upcoming EARN Data Workshops:
  - Foraging for Data in the Wild: Finding, loading, and wrangling economic data with R - August 19th, 2025, 2:30-3:45pm ET
  - Using EPI's CPS Microdata Extracts in R - September 4th, 2025, 2:00-3:15pm ET
- EARNCon 2025
  - Lowes New Orleans Hotel, Nov. 12 – 14th
  - State of Working X Bootcamp - November 12th, 2025

Today's Agenda

- Distinguishing R vs. RStudio
- Installation walk-through
  - Windows and Mac
- Navigating the RStudio user interface (UI)
- Basics and key topics for beginners
  - Projects-oriented workflow
  - Basic commands / R is a calculator
  - Installing and using packages
- Basic workflow example
- Helpful resources
- Technical assistance following webinar conclusion

R vs. RStudio

```
R version 4.5.1 (2025-06-13) -- "Great Square Root"
Copyright (C) 2025 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu

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.

[Previously saved workspace restored]

>
```



Installing R and RStudio

- Download link: https://posit.co/downloads/

Which version to download

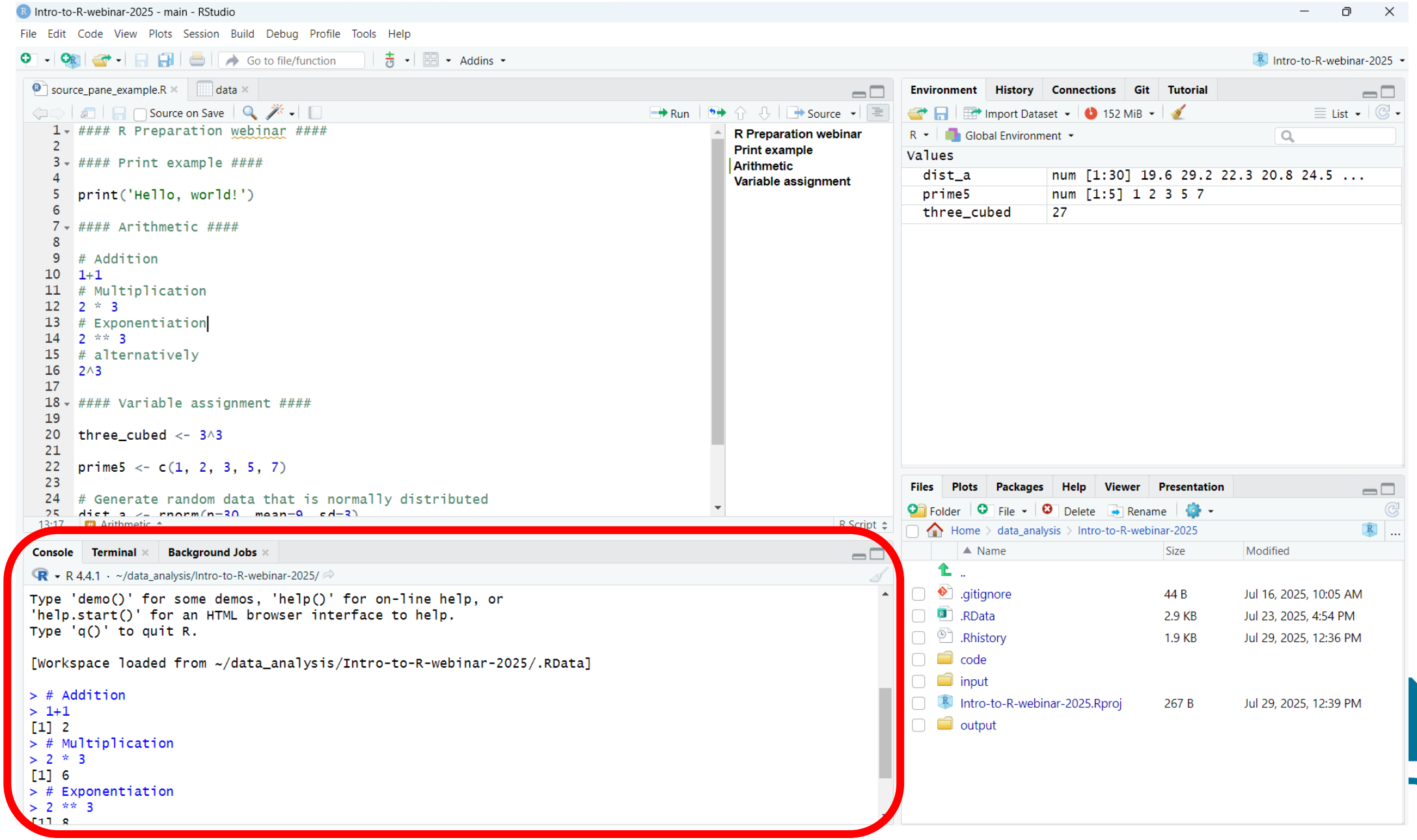
1. Download R for Windows/Mac
   a. If on Windows, download Rtools & Base R installer
   b. If on Mac, install R
2. Download R Studio
   a. If on Windows, download Rstudio
   b. If on Mac, download Rstudio
      i. In a terminal, run `/usr/sbin/softwareupdate --install-rosetta`

	Windows users	Mac users
	Intel vs ARM?	Intel vs M ?
Step 1:	Press windows key	Click Apple icon on top left corner
Step 2:	Type “about” and select “About your pc”	Select “About This Mac
Step 3:	Intel vs ARM?	Intel vs M chip?
Step 4 (Mac):		If M chip, install Rosetta

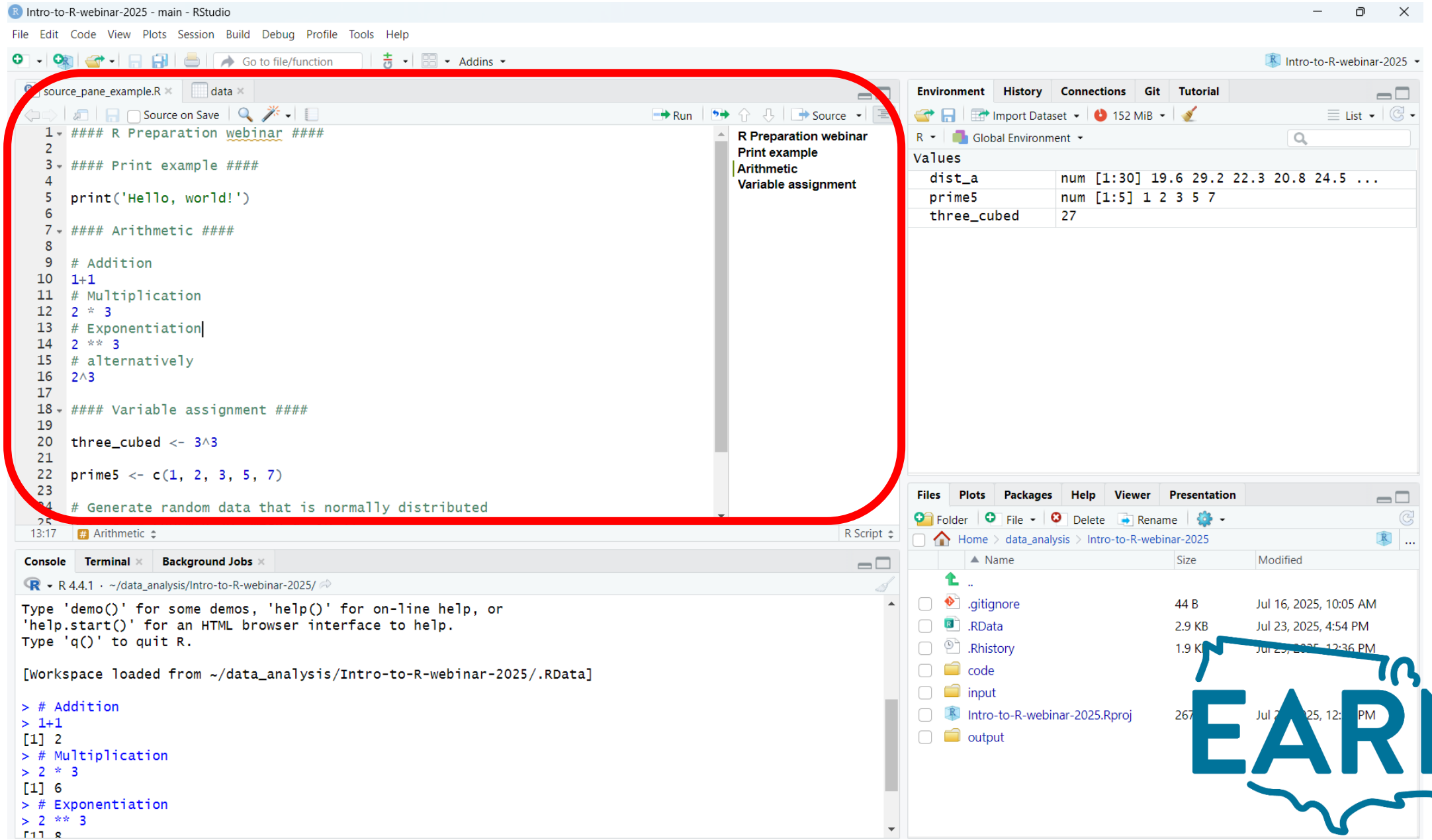
Navigating the user interface (UI)

- Welcome R, users! 🎉
- Four primary panes:
  - Console
  - Source
  - Environment
  - Output

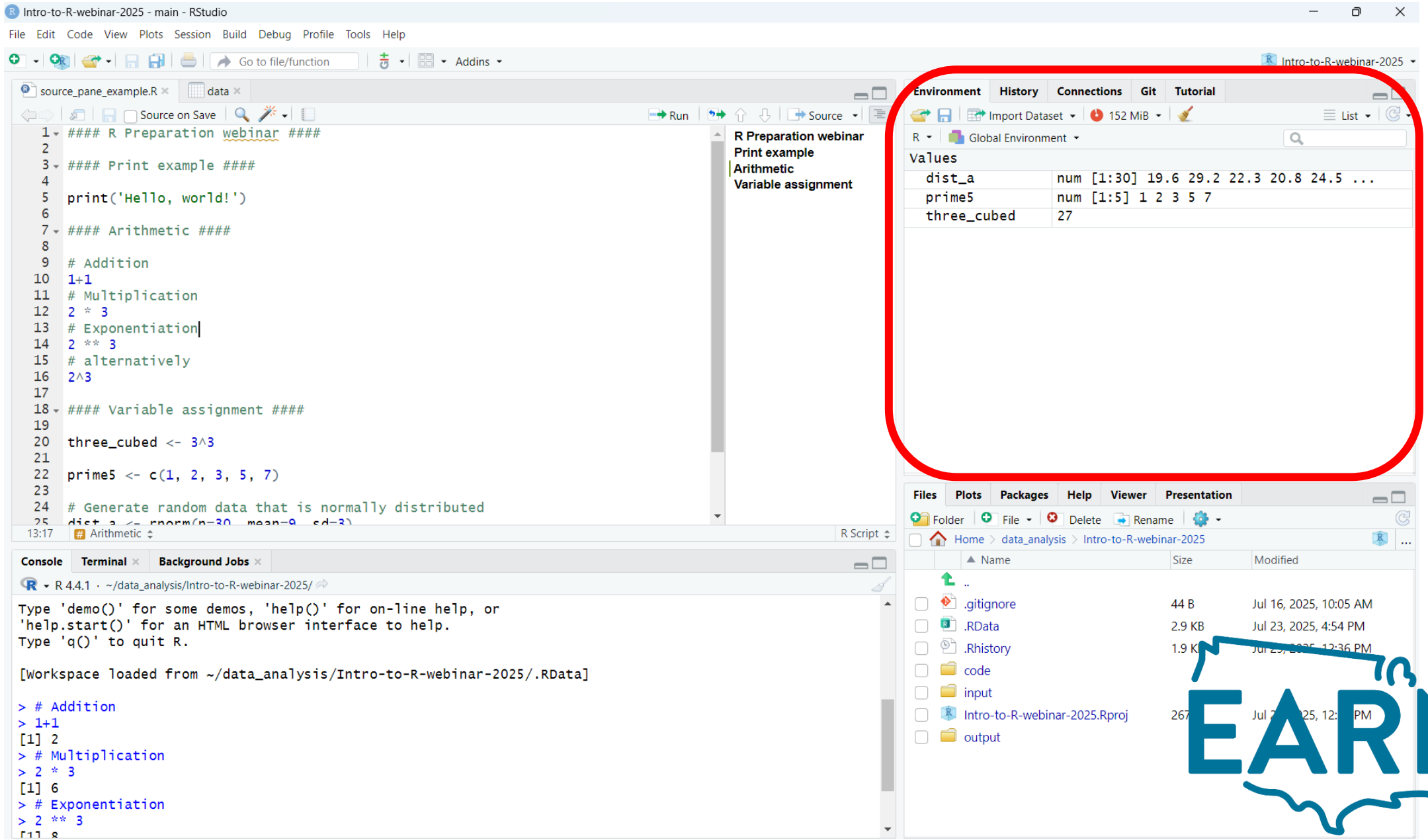
Navigating the user interface (UI) – **Console pane**



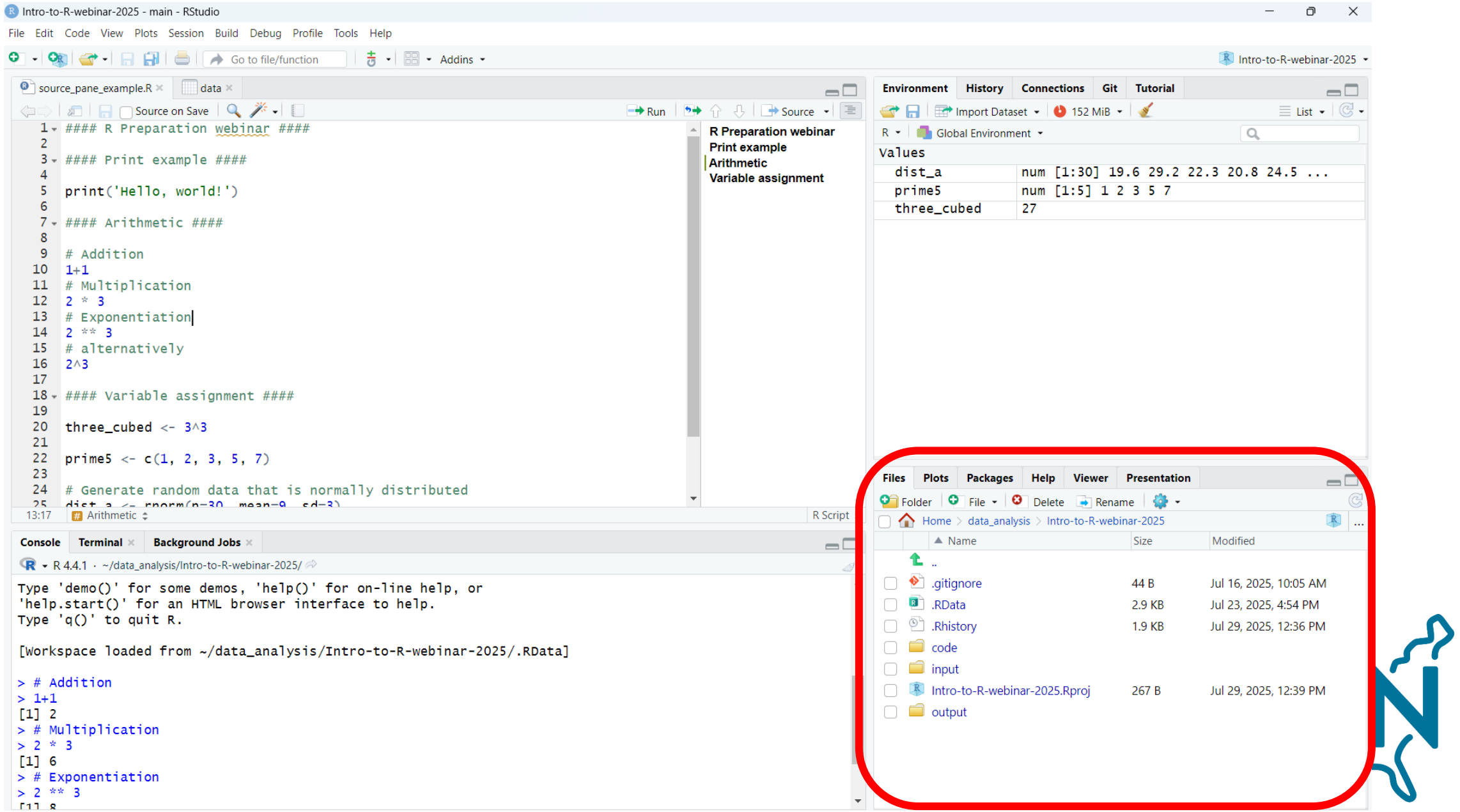
Navigating the user interface (UI) – **Source pane**



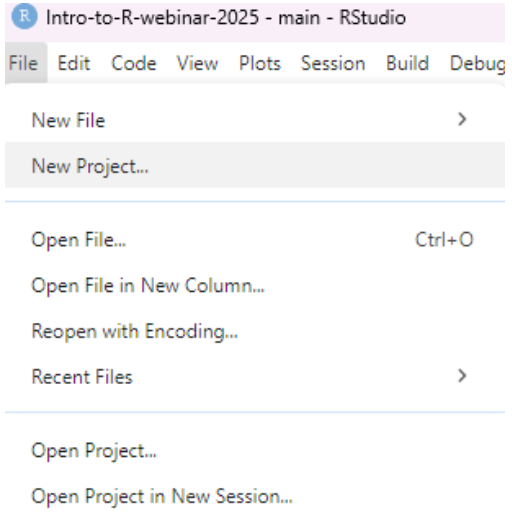
Navigating the user interface (UI) – **Environment pane**



Navigating the user interface (UI) – **Output pane**

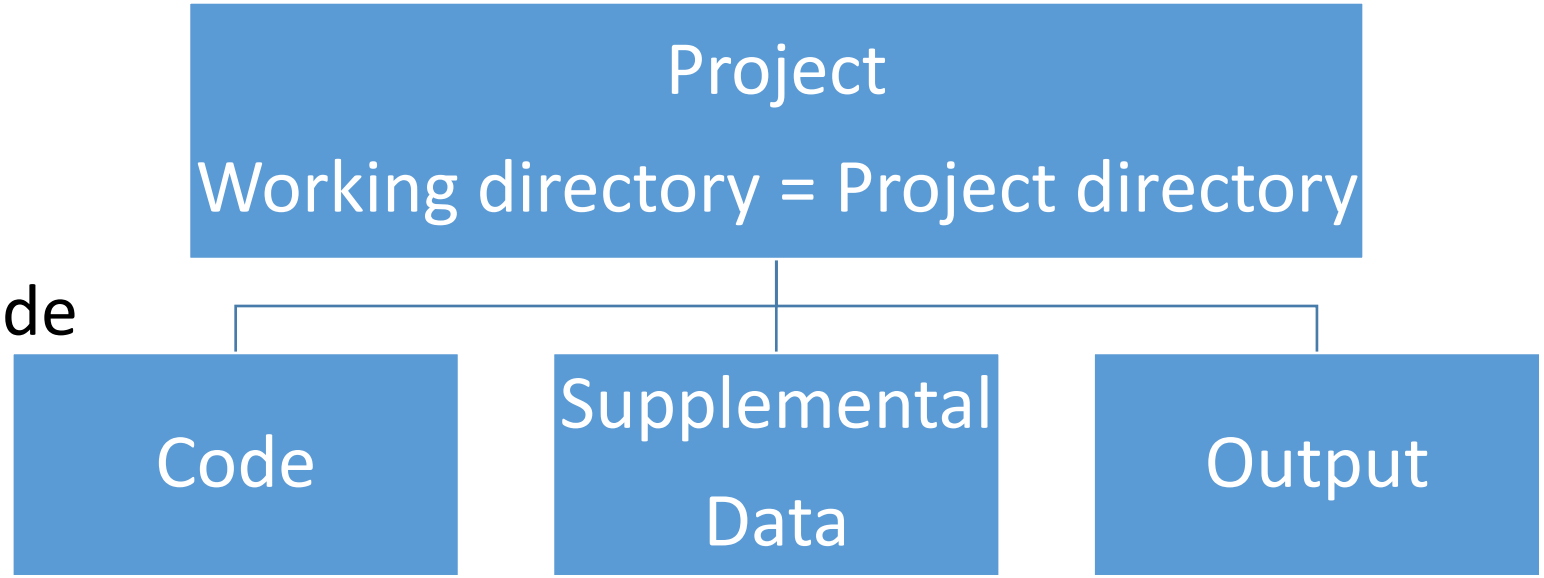


Project-oriented Workflow



- File system discipline: Project root directory
- Working directory intentionality
- File path discipline: files relative to working directory

- Self-contained & portable
  - Reliable and precise code
- Organization
  - Accurate code



"Any resident R script is written assuming that it will be run from a fresh R process with working directory set to the project directory. It creates everything it needs, in its own workspace or folder, and it touches nothing it did not create. This convention guarantees that the project can be moved around on your computer or onto other computers and will still "just work". "

Basic commands: R is a calculator

- **Simple arithmetic calculations**

```
# run in console
1+1
```

```
## [1] 2
```

```
4*9
```

```
## [1] 36
```

```
3^(1/2)
```

```
## [1] 1.732051
```

```
1+3+5+7+9
```

```
## [1] 25
```

- **Use <- to save objects in the workspace**

```
# define x as 5
x <- 5

# x + 1 ~ 5 + 1
x + 1
```

```
## [1] 6
```

Basics and key topics: Packages

- Installing a package:
  - `Install.package("tidyverse")`
  - `Install.package("here")`
- Loading a package
  - `Library(tidyverse)`
  - `Library(here)`

Tidy philosophy:

1. Human readable
2. Consistent
3. Composable

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Chained operations using “pipes”

- Piping: passing the value of the left-hand-side (LHS) to the to the first argument on the right-hand-side (RHS)
  - `x |> f(y) ~ f(x, y)`

```
# use pipe to filter org_sample
org_sample |> select(wage)
## # A tibble: 242,582 × 1
##     wage
##    <dbl>
##  1  30.6
##  2  15.6
##  3   9
## # ℹ 242,572 more rows
```

|> or %>%

- Chaining multiple operations:

```
org_sample |>
  # TX wage and salary workers
  filter(statefips == 48,
         age >= 16, cow1 <= 5, wage > 0) |>
  # annualize weight
  mutate(adj_wgt = orgwgt/12)
```

```
## # A tibble: 7,336 × 139
##     year month minsamp hrhhid         hrhhid2 hrsample hrsersuf huhhnum pulineno
##    <int> <int>   <int> <chr>          <chr>   <chr>    <chr>      <int>    <int>
##  1  2023     1       8 6074173588100… 13011   ""       ""            NA        1
##  2  2023     1       8 2100074149414… 13011   ""       ""            NA        2
##  3  2023     1       4 0408103688873… 15011   ""       ""            NA        1
## # ℹ 7,326 more rows
```

Basic workflow example

1. Create project
2. Create file structure as needed (code, data, output folders)
3. Create and save script
4. Install and load packages
5. Data analysis/manipulation code
6. Export to .xlsx or .csv file

Helpful resources

- EARN Code Library
  - https://economic.github.io/earn_code_library/
- R for Data Science book
  - https://r4ds.had.co.nz/
- Free R tutorial
  - https://pll.harvard.edu/course/data-science-r-basics
- Troubleshooting tips
  - Stack overflow, Reddit, other Q&A forums
  - AI assistance?
  - https://statisticsglobe.com/errors-warnings-r (needs to be reviewed)

More helpful resources

- Quick list of useful R packages (posit support)
- What They Forgot to Teach You About R
- Beginner's tutorial to R packages (DataCamp)
- Stay in touch! Reach out to the EARN team with coding questions!