Different Approaches to Shiny App Development

By Andrés F. Quintero

Who am I?

- Software Engineer from Colombia
- Specialise in building Shiny Apps
- Currently work building Shiny Applications for use in healthcare institutions
- Free/Open Source advocate and enthusiast

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What is this presentation about?

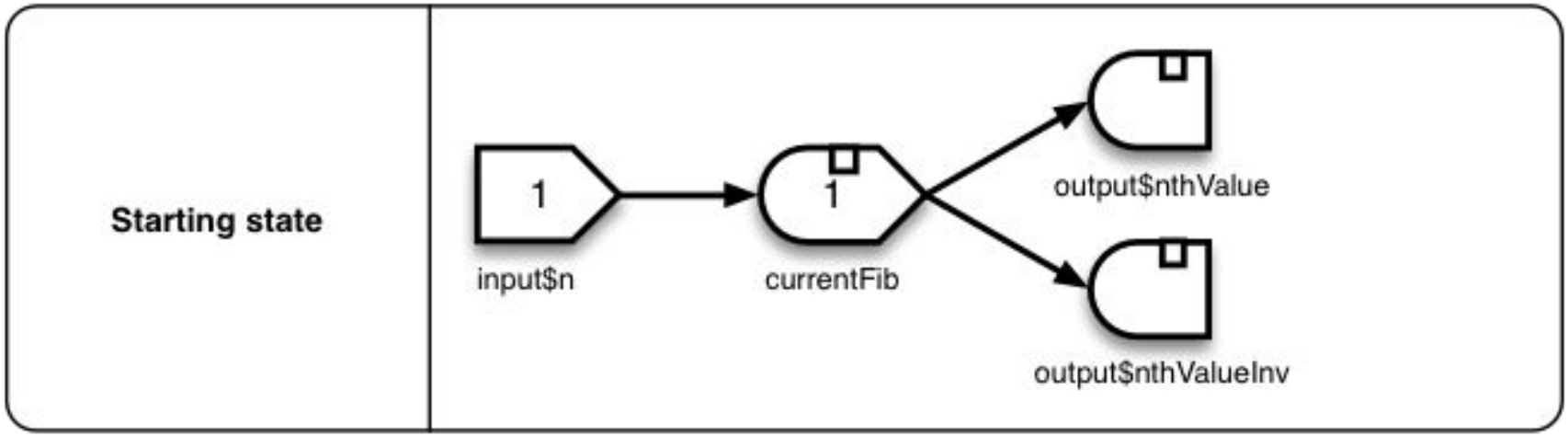
- The different approaches to server-side logic inside Shiny Applications.
- Geared toward Shiny developers looking to learn about how different teams or people could write Shiny Apps.
- Three different methods I have personally used extensively.

What do I mean by approach?

- Consistency and restrictions

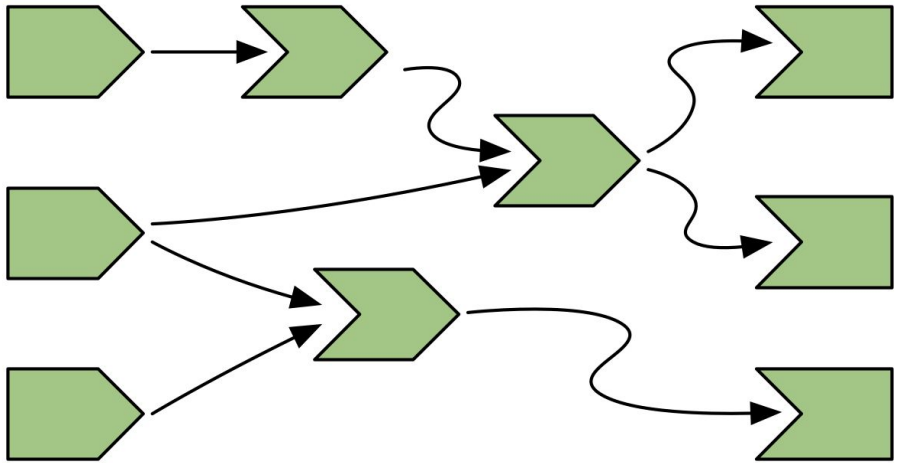
“Functional” approach

- Reactives are immutable and “pre-defined”.



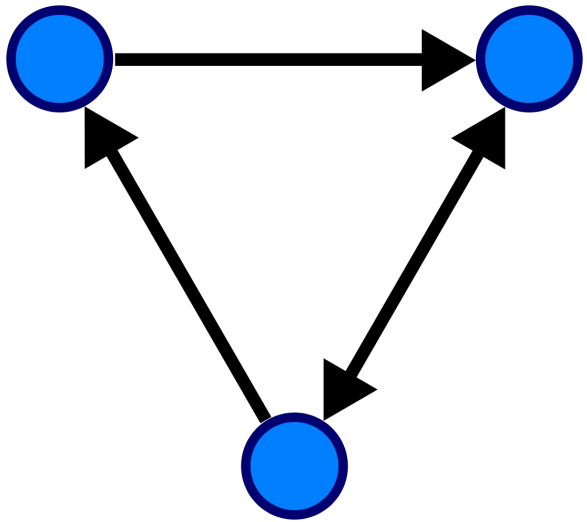
Benefits to the functional approach

- Most predictable
- Clean reactive graph
- “Cleaner” code



Downsides to functional approach

- Can be hard to manage non-linear reactive graphs.



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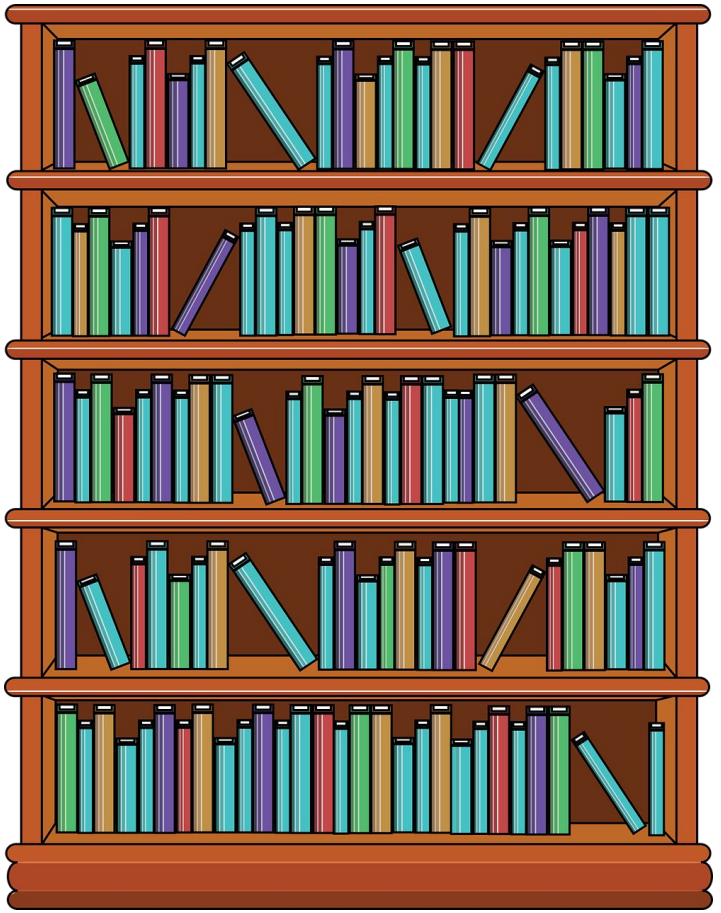
Imperative Approach

Saves state in reactive values.



Benefits of imperative approach

- Easier to manage non-linear workflows
- Reactives are mutable and can be created dynamically

Downsides to imperative approach

- “Complicated” reactive graphs.
- If not managed carefully, bugs can creep in.
- Keeping track of messy data gets hard.

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server <- function(input, output) {

  globals <- reactiveValues()

  # Read dataset based on input file name
  observe({
    globals$dataset <- readr::read_csv(
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    )
  })

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  # Select only the variables of the data set the user selects
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Object oriented approach

Data is stored in objects which can be accessed from anywhere in the app (Objects are not reactive).

Benefits of the object oriented approach

- “Easier” to organize data
- Data can be shared throughout the application without interfering with the reactive graph
- Great for bigger apps with many data sources and types.

Downsides to the object oriented approach

- Can be more work.
- Works against the general notion of how R code is usually written.
- Does not interfere the reactive graph.
- Harder to mix with other approaches.

```r
dataset <- R6Class(
  "APP Data",
  list(
    data = mtcars,
    filtered_data = data.frame(),
    set = function(data) {
      self$data <- data
    },
    select_vars = function(vars) {
      self$filtered_data <- self$data %>%
        dplyr::select({{ vars }})
    }
  )
)
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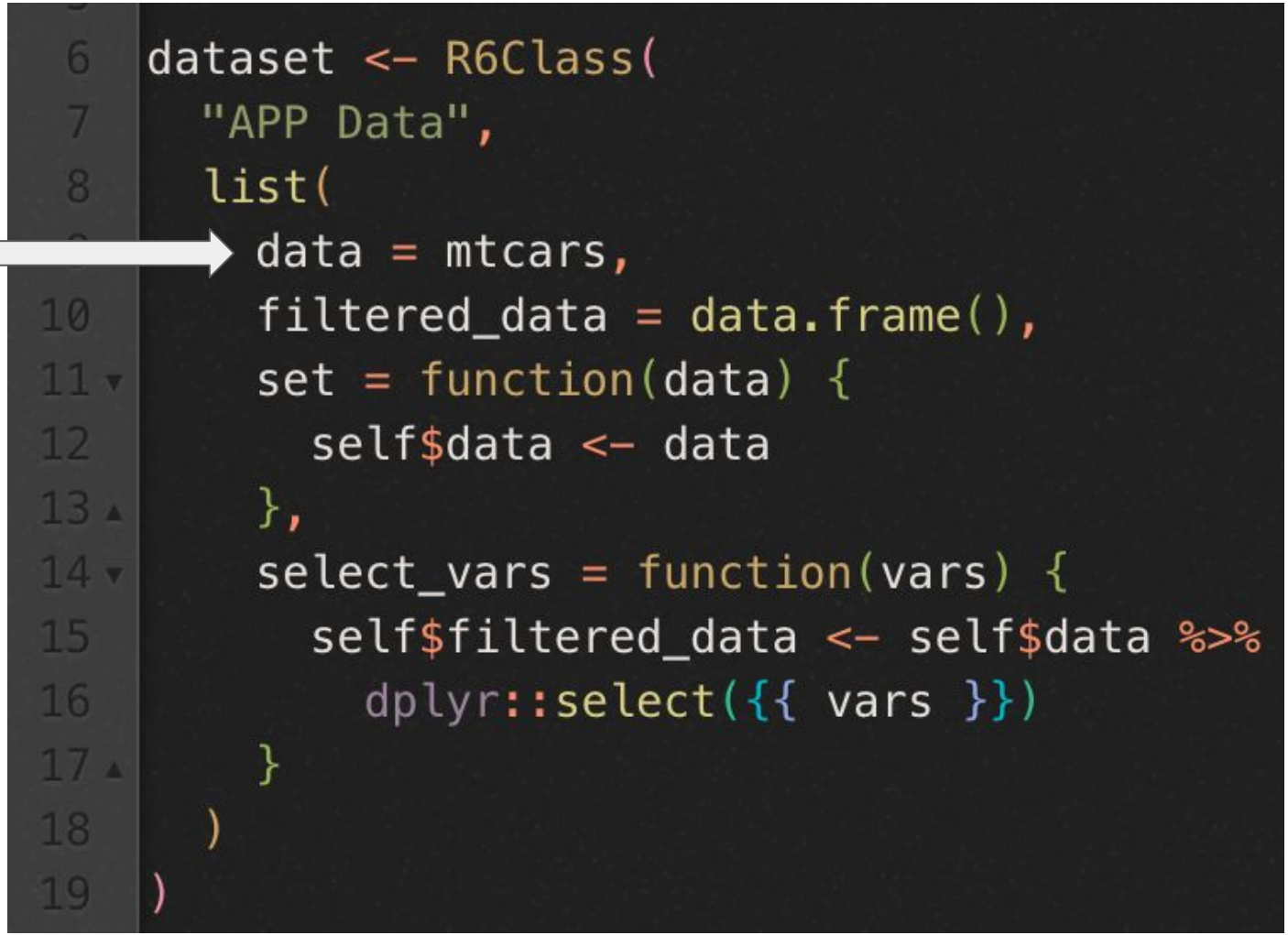
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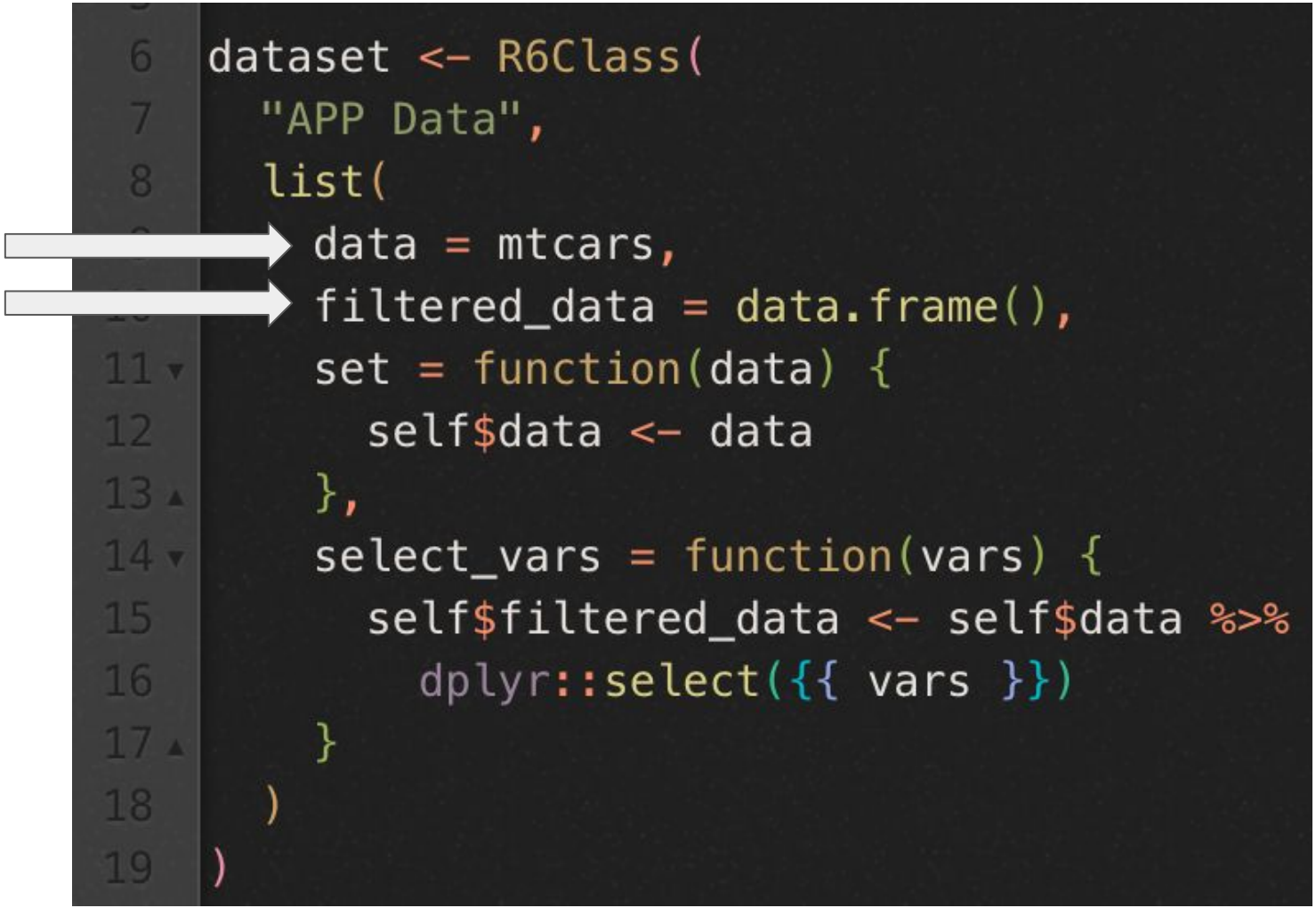
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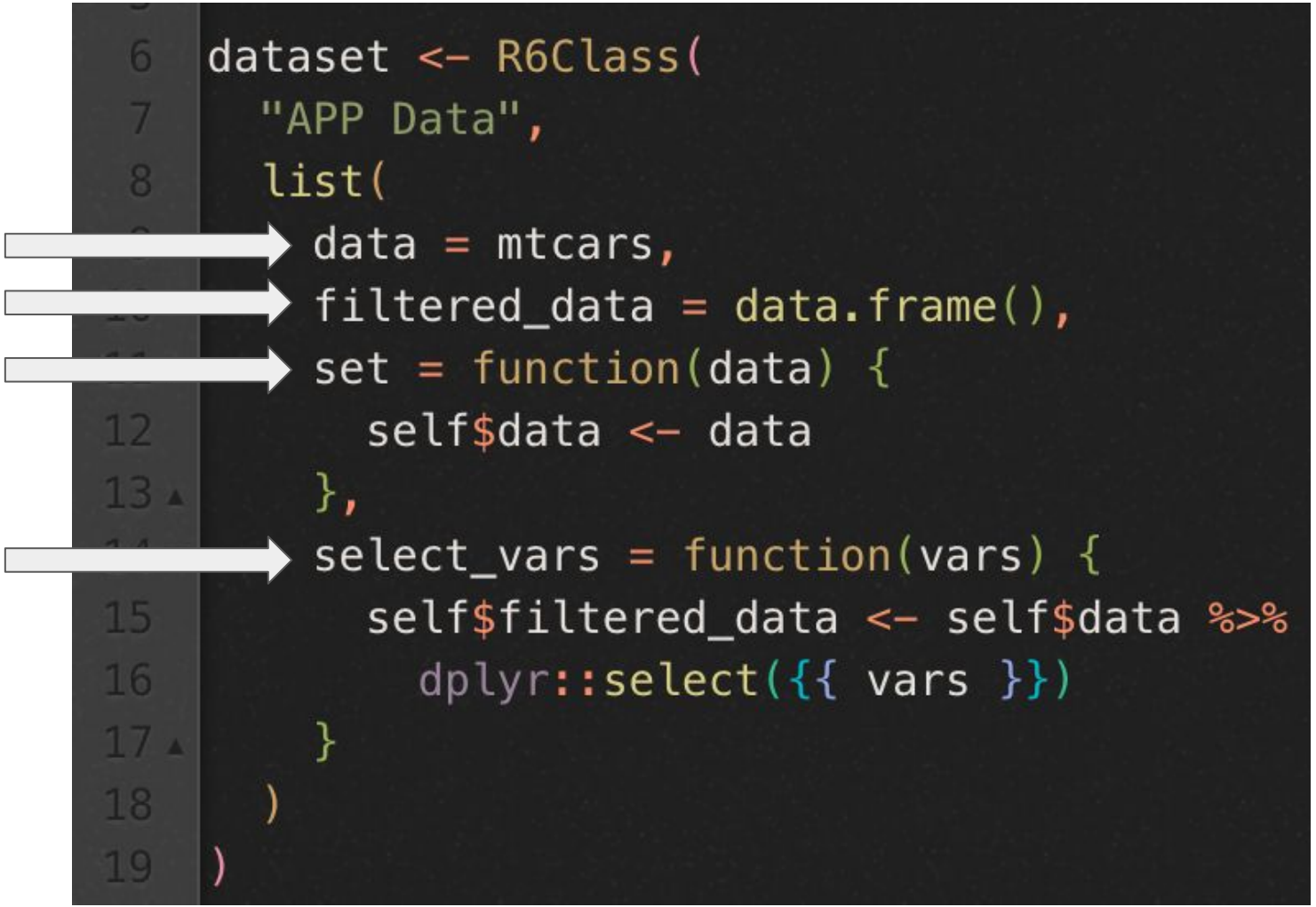
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Initialize a new object

Init triggers

Set the data to that which the user selected

Trigger “selected_dataset”

Run when “selected_dataset” is triggered

Set selected variables to those in input$variables
and trigger “selected_variables”

Render the data when “selected_variables” is triggered

Conclusion

- Most approaches are completely valid for production grade applications.
- It is important to determine which approach is easier to work with for a particular project.
- Consistency is key, code is understandable as long as it is consistent.

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