Designing UI

Daniel Kaplan

dtkaplan

dtkaplan@gmail.com

- Web application UI is ultimately HTML/CSS/JavaScript
- Let's R users write user interfaces using a simple, familiar-looking API…
- …but no limits for advanced users

Interface builder functions

tags

```
> names(tags)
  [1] "a"          "abbr"       "address"    "area"       "article"
  [6] "aside"      "audio"      "b"          "base"       "bdi"
 [11] "bdo"        "blockquote" "body"       "br"         "button"
 [16] "canvas"     "caption"    "cite"       "code"       "col"
 [21] "colgroup"   "command"    "data"       "datalist"   "dd"
 [26] "del"        "details"    "dfn"        "div"        "dl"
 [31] "dt"         "em"         "embed"      "eventsource" "fieldset"
 [36] "figcaption" "figure"     "footer"     "form"       "h1"
 [41] "h2"         "h3"         "h4"         "h5"         "h6"
 [46] "head"       "header
 [51] "i"          "iframe"
 [56] "kbd"        "keygen"
 [61] "link"       "mark"       "map"        "menu"       "meta"
 [66] "meter"      "nav"        "noscript"   "object"     "ol"
 [71] "optgroup"   "option"     "output"     "p"          "param"
 [76] "pre"        "progress"   "q"          "ruby"       "rp"
 [81] "rt"         "s"          "samp"       "script"     "section"
 [86] "select"     "small"      "source"     "span"       "strong"
 [91] "style"      "sub"        "summary"    "sup"        "table"
 [96] "tbody"      "td"         "textarea"   "tfoot"      "th"
[101] "thead"      "time"       "title"      "tr"         "track"
[106] "u"          "ul"         "var"        "video"      "wbr"
```

```
<i> some text </i>
```

tag → HTML

```
> tags$b("This is my first app")
<b>This is my first app</b>
```

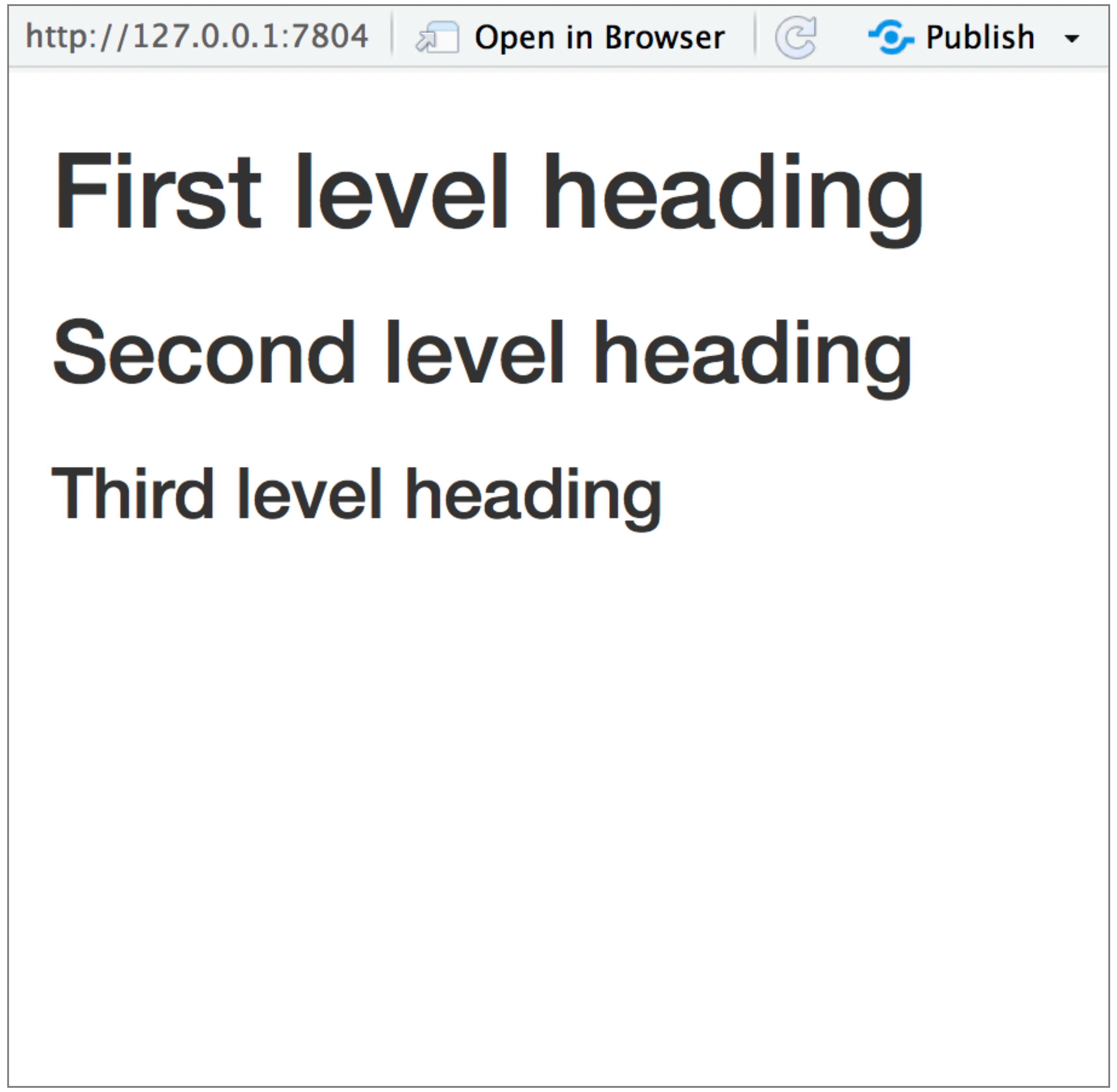
Header tags

```
library(shiny)

# Define UI with tags
ui <- fluidPage(
  tags$h1("First level heading"),
  tags$h2("Second level heading"),
  tags$h3("Third level heading")
)

# Define server fn that does nothing :)
server <- function(input, output) {}

# Create the app object
shinyApp(ui = ui, server = server)
```



First level heading
Second level heading
Third level heading

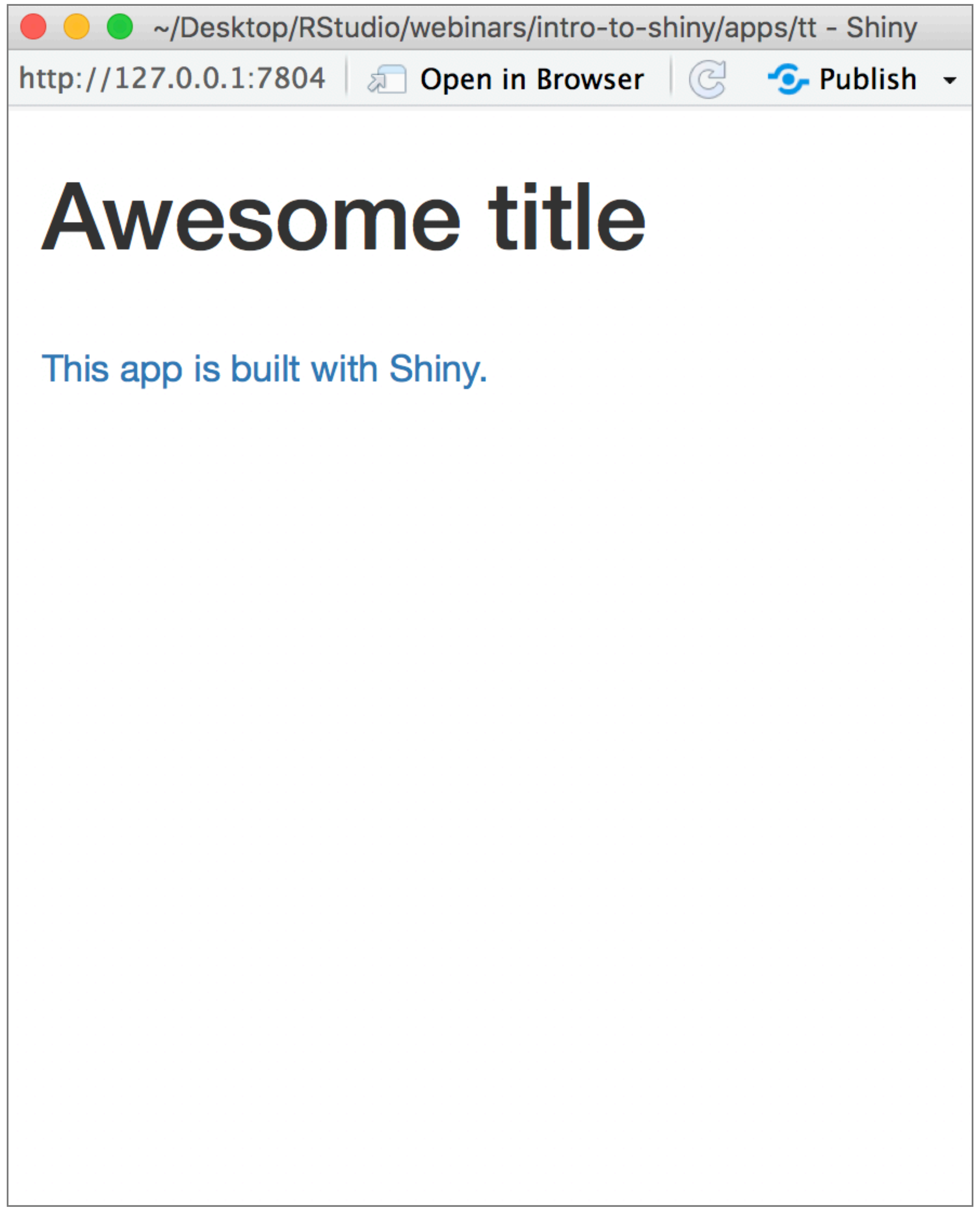
Linked text

```
library(shiny)

# Define UI with tags
ui <- fluidPage(
  tags$h1("Awesome title"),
  tags$br(), # line break
  tags$a("This app is built with Shiny.", href = "http://
shiny.rstudio.com/")
)

# Define server fn that does nothing :)
server <- function(input, output) {}

# Create the app object
shinyApp(ui = ui, server = server)
```



Awesome title

This app is built with Shiny.

Nested tags

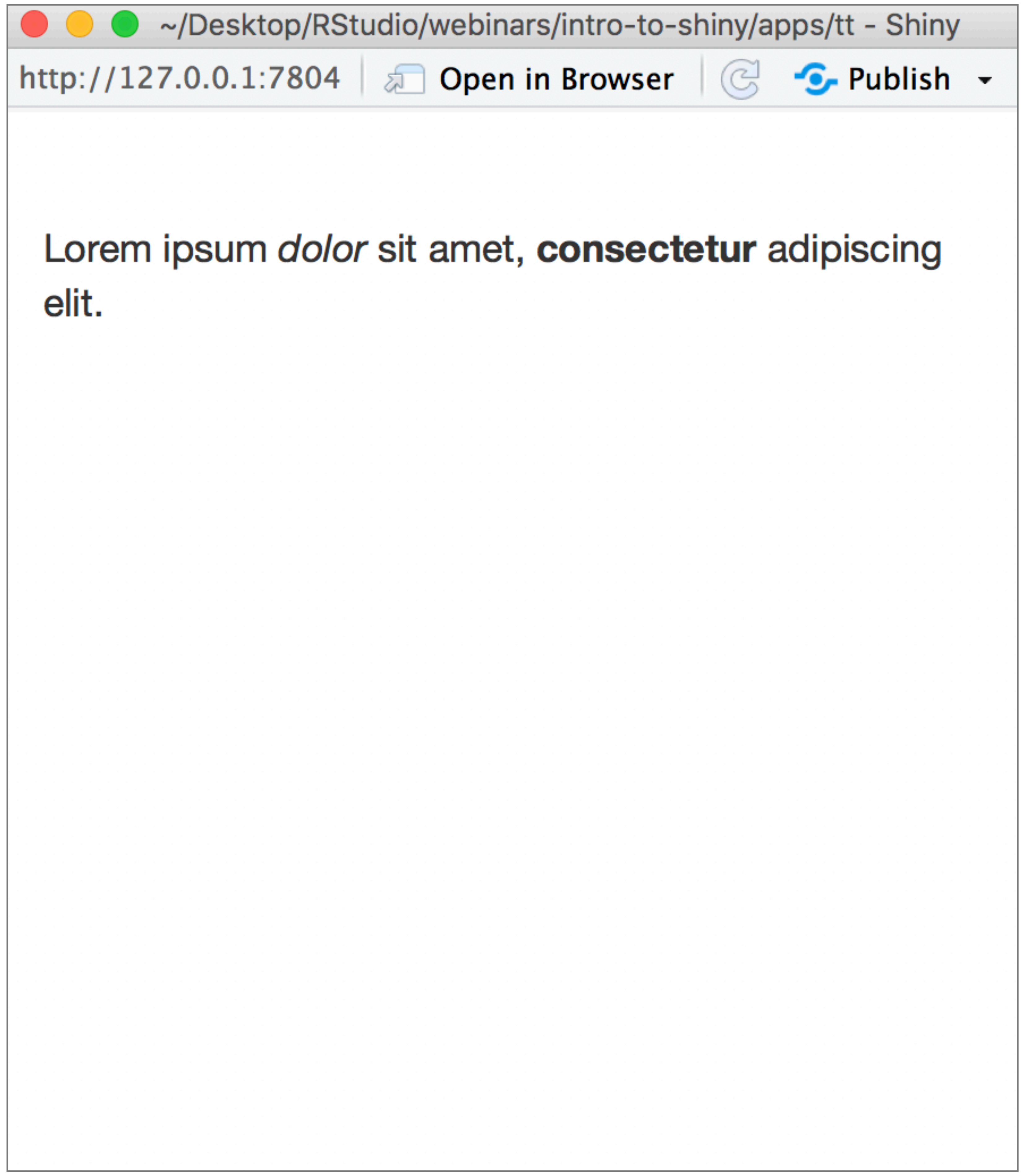
```
library(shiny)

# Define UI with tags
ui <- fluidPage(
   tags$p("Lorem ipsum",
      tags$em("dolor"), "sit amet,",
      tags$b("consectetur"),
      "adipiscing elit.")

)

# Define server fn that does nothing :)
server <- function(input, output) {}

# Create the app object
shinyApp(ui = ui, server = server)
```



Lorem ipsum *dolor* sit amet, **consectetur** adipiscing elit.

Common tags

tags$p(...)		p(...)
tags$h1(...)		h1(...)
tags$h2(...)		h2(...)
tags$h3(...)		h3(...)
tags$h4(...)		h4(...)
tags$h5(...)		h5(...)
tags$h6(...)		h6(...)
tags$a(...)	→	a(...)
tags$br(...)		br(...)
tags$div(...)		div(...)
tags$span(...)		span(...)
tags$pre(...)		pre(...)
tags$code(...)		code(...)
tags$img(...)		img(...)
tags$strong(...)		strong(...)
tags$em(...)		em(...)
tags$hr(...)		hr(...)

Commonly used tags have wrappers with short names.

All of these are just wrappers on tag().

Common tags

```
> tags$a("Anchor text")
<a>Anchor text</a>
> a("Anchor text")
<a>Anchor text</a>

> tags$br()
<br/>
> br()
<br/>

> tags$code("Monospace text")
<code>Monospace text</code>
> code("Monospace text")
<code>Monospace text</code>

> tags$h1("First level header")
<h1>First level header</h1>
> h1("First level header")
<h1>First level header</h1>
```

HTML

```
> HTML("Hello world, <br/> and then a line break.")
Hello world, <br/> and then a line break.
```

Your turn

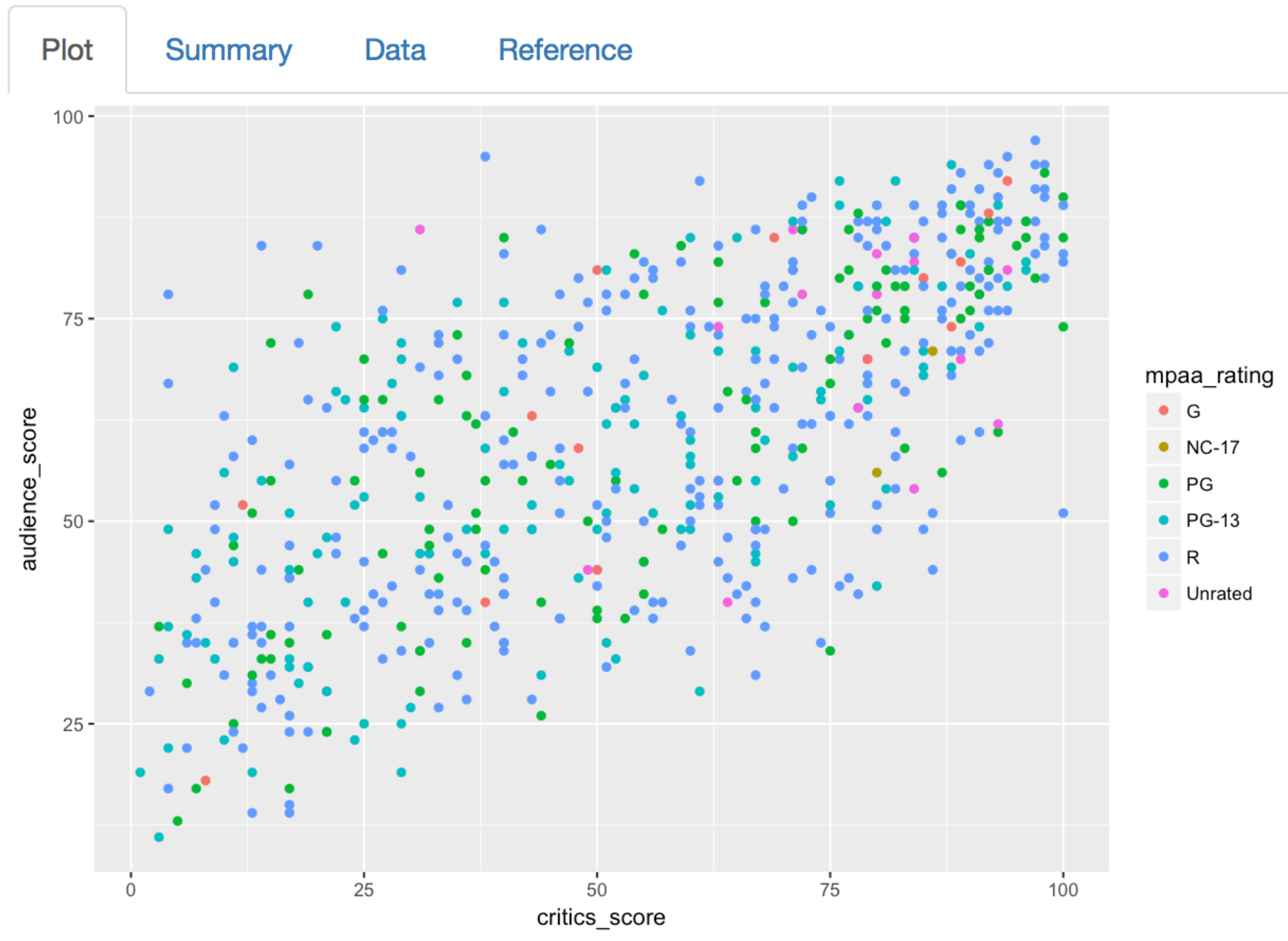
- Start with movies_11.R.
- Add some helper text to the app using tags that let your users know how to navigate the app.
    - For instance, insert some HTML above a control.
- **Stretch goal**: Arrange control labels to have pop-up text explaining them.

5m 00s

Tabs

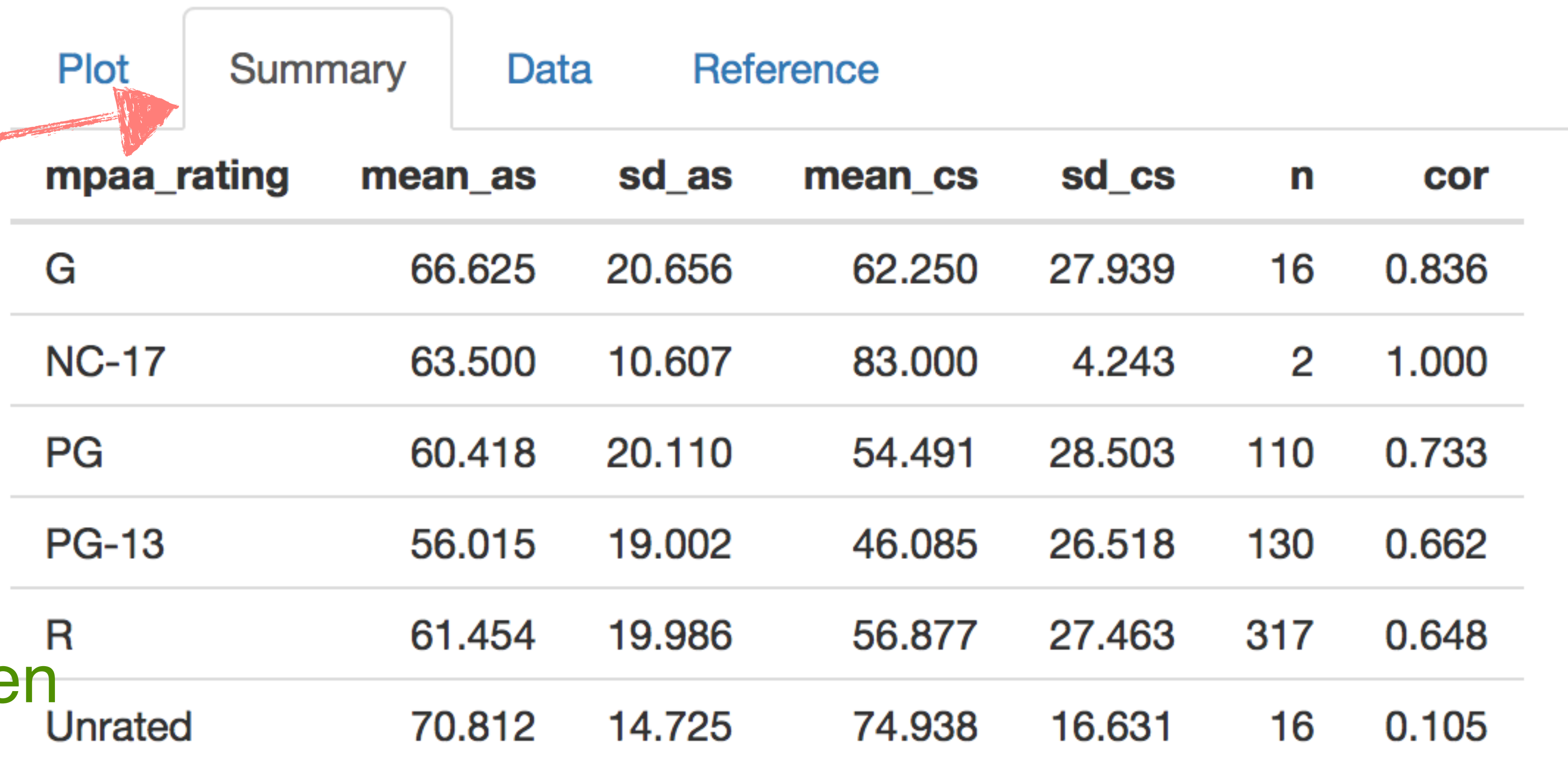
tabPanel()

```
mainPanel(
 tabsetPanel(type = "tabs",
            tabPanel("Plot", plotOutput("plot")),
            tabPanel("Summary", tableOutput("summary")),
            tabPanel("Data", DT::dataTableOutput("data")),
            tabPanel("Reference",
  tags$p("There data were obtained from",
   tags$a("IMDB", href = "http://www.imdb.com/"), "and",
   tags$a("Rotten Tomatoes", href = "https://www.rottentomatoes.com/"), "."),
  tags$p("The data represent", nrow(movies), "randomly sampled movies released be
1972 to 2014 in the United States.")
  )
 )
```



tabPanel()

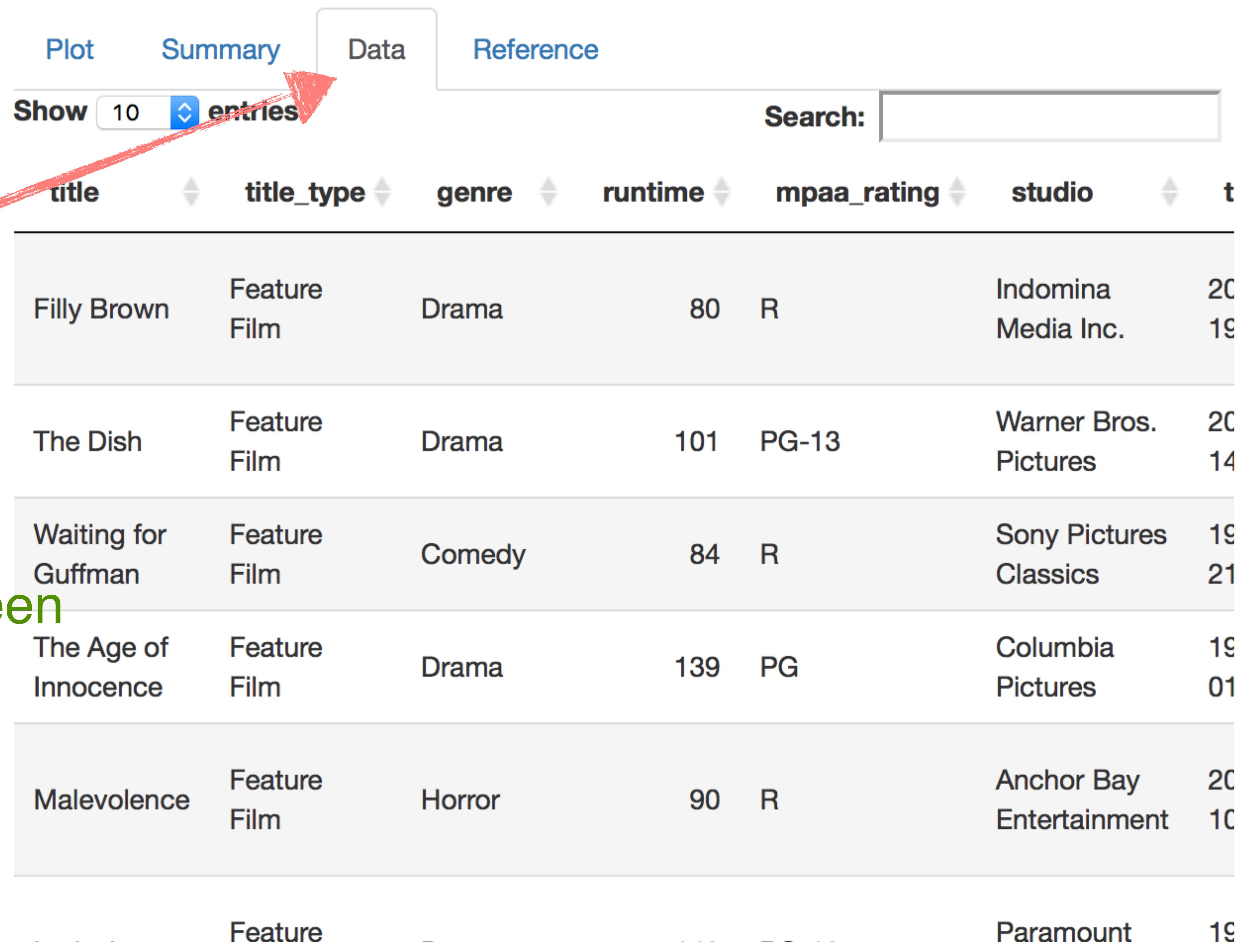
```
mainPanel(
 tabsetPanel(type = "tabs",
            tabPanel("Plot", plotOutput("plot")),
            tabPanel("Summary", tableOutput("summary")),
            tabPanel("Data", DT::dataTableOutput("data")),
            tabPanel("Reference",
  tags$p("There data were obtained from",
   tags$a("IMDB", href = "http://www.imdb.com/"), "and",
   tags$a("Rotten Tomatoes", href = "https://www.rottentomatoes.com/"), “."),
  tags$p("The data represent", nrow(movies), "randomly sampled movies released between
1972 to 2014 in the United States.")
  )
 )
```



mpaa_rating	mean_as	sd_as	mean_cs	sd_cs	n	cor
G	66.625	20.656	62.250	27.939	16	0.836
NC-17	63.500	10.607	83.000	4.243	2	1.000
PG	60.418	20.110	54.491	28.503	110	0.733
PG-13	56.015	19.002	46.085	26.518	130	0.662
R	61.454	19.986	56.877	27.463	317	0.648
Unrated	70.812	14.725	74.938	16.631	16	0.105

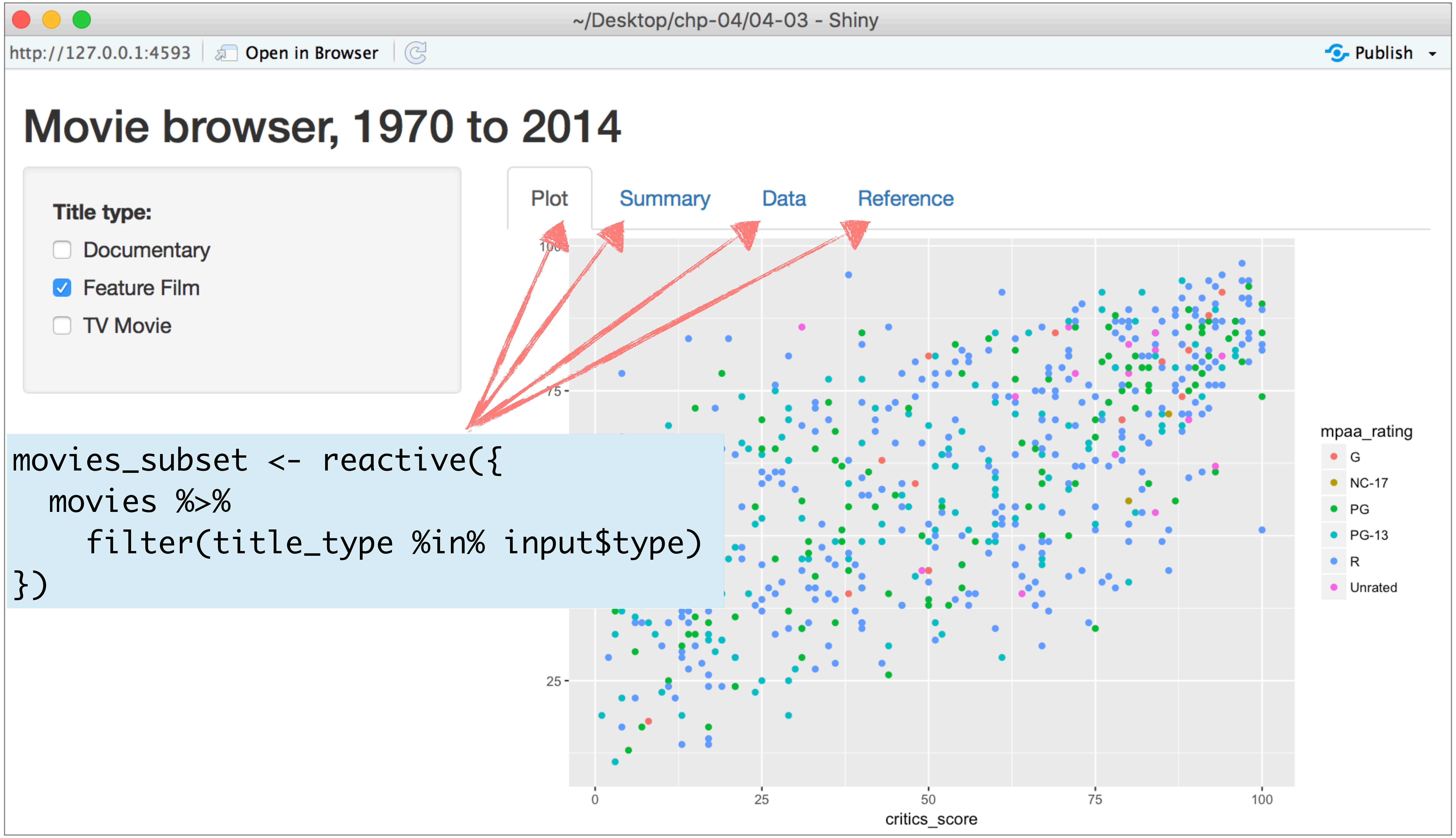
tabPanel()

```
mainPanel(
 tabsetPanel(type = "tabs",
            tabPanel("Plot", plotOutput("plot")),
            tabPanel("Summary", tableOutput("summary")),
            tabPanel("Data", DT::dataTableOutput("data")),
            tabPanel("Reference",
  tags$p("There data were obtained from",
   tags$a("IMDB", href = "http://www.imdb.com/"), "and",
   tags$a("Rotten Tomatoes", href = "https://www.rottentomatoes.com/"), "."),
  tags$p("The data represent", nrow(movies), "randomly sampled movies released between
1972 to 2014 in the United States.")
  )
 )
```



title	title_type	genre	runtime	mpaa_rating	studio	t
Filly Brown	Feature Film	Drama	80	R	Indomina Media Inc.	20 19
The Dish	Feature Film	Drama	101	PG-13	Warner Bros. Pictures	20 14
Waiting for Guffman	Feature Film	Comedy	84	R	Sony Pictures Classics	19 21
The Age of Innocence	Feature Film	Drama	139	PG	Columbia Pictures	19 01
Malevolence	Feature Film	Horror	90	R	Anchor Bay Entertainment	20 10
	Feature				Paramount	19

Tabs and reactivity

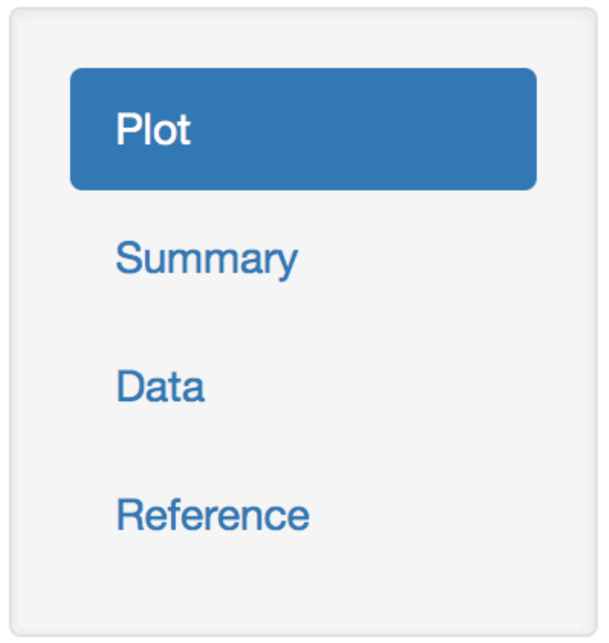


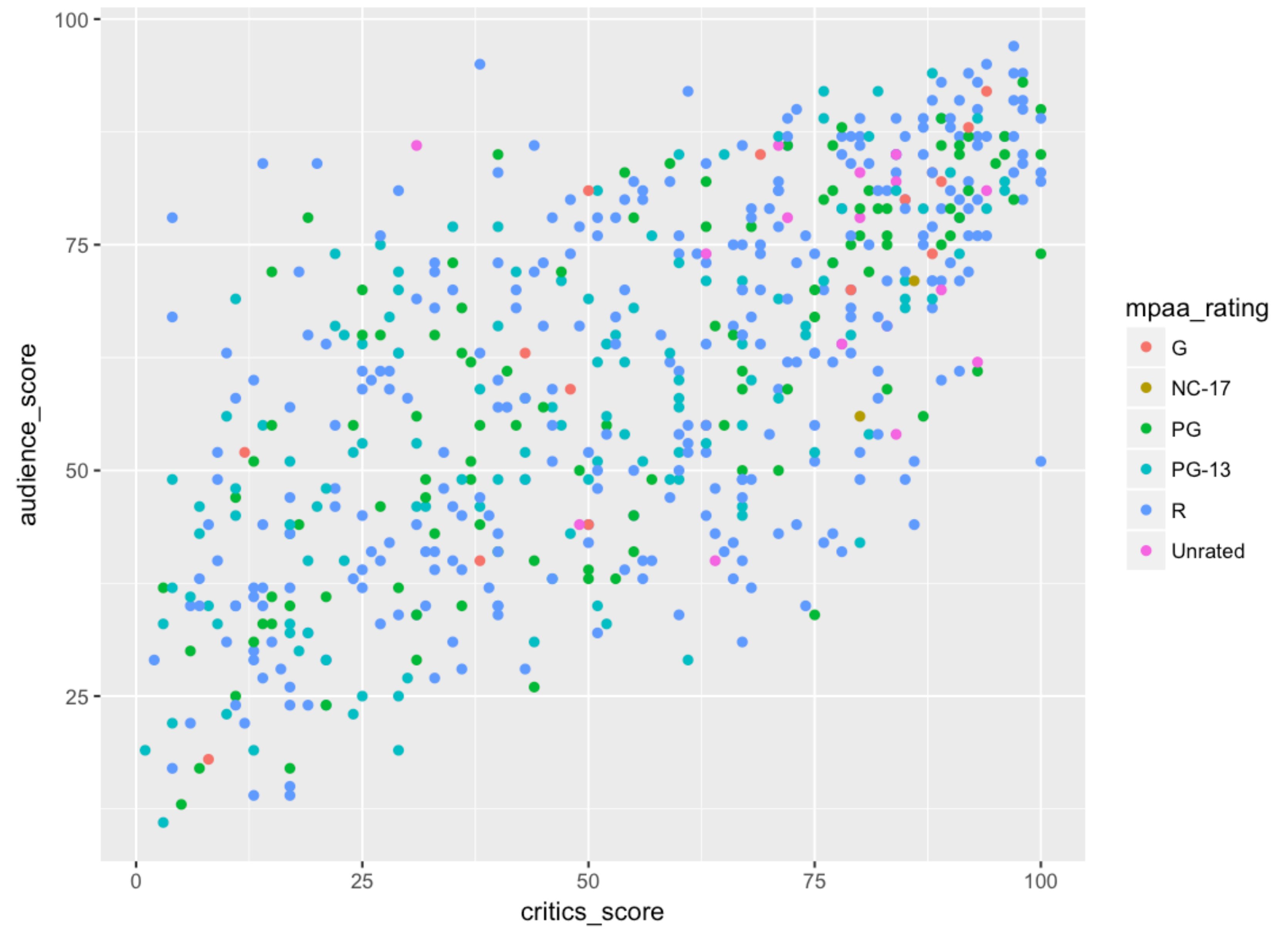
Title type:
- [ ] Documentary
- [✓] Feature Film
- [ ] TV Movie

```
movies_subset <- reactive({
  movies %>%
    filter(title_type %in% input$type)
})
```

navlistPanel()

```
mainPanel(
 navlistPanel(tabPanel("Plot", plotOutput("plot")),
             tabPanel("Summary", tableOutput("summary")),
             tabPanel("Data", DT::dataTableOutput("data")),
             tabPanel("Reference",
  tags$p("There data were obtained from",
   tags$a("IMDB", href = "http://www.imdb.com/"), "and",
   tags$a("Rotten Tomatoes", href = "https://www.rottentomatoes.com/"), ".")
  tags$p("The data represent", nrow(movies), "randomly sampled movies rel
between 1972 to 2014 in the United States.")
  )
 )
```



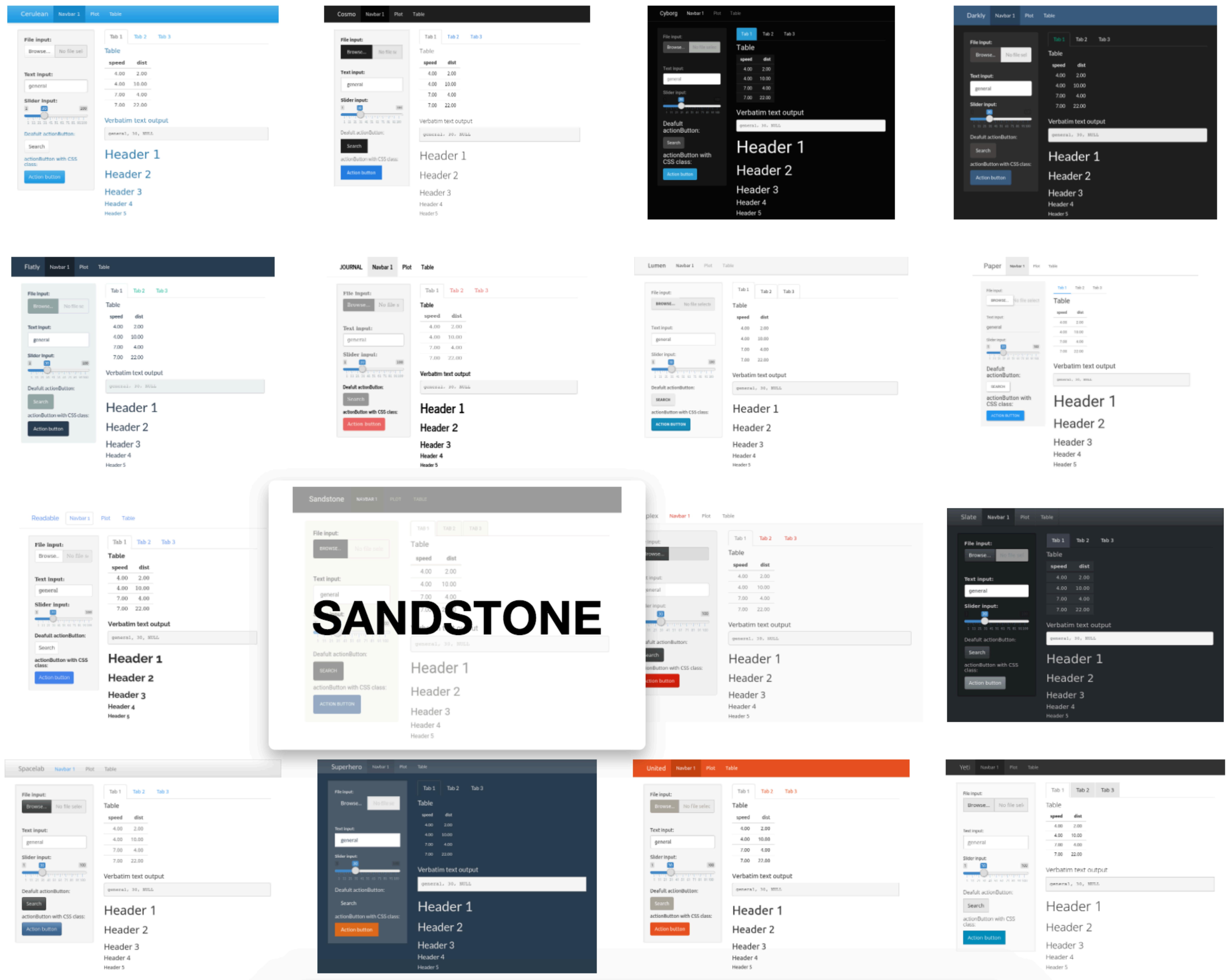


Your turn

- Continue working on movies_11.R.
- Split the app into two tabs: one for plot and the other for data table.
- **Stretch goal:** Add another tab for summary statistics and references.

10m 00s

shinythemes

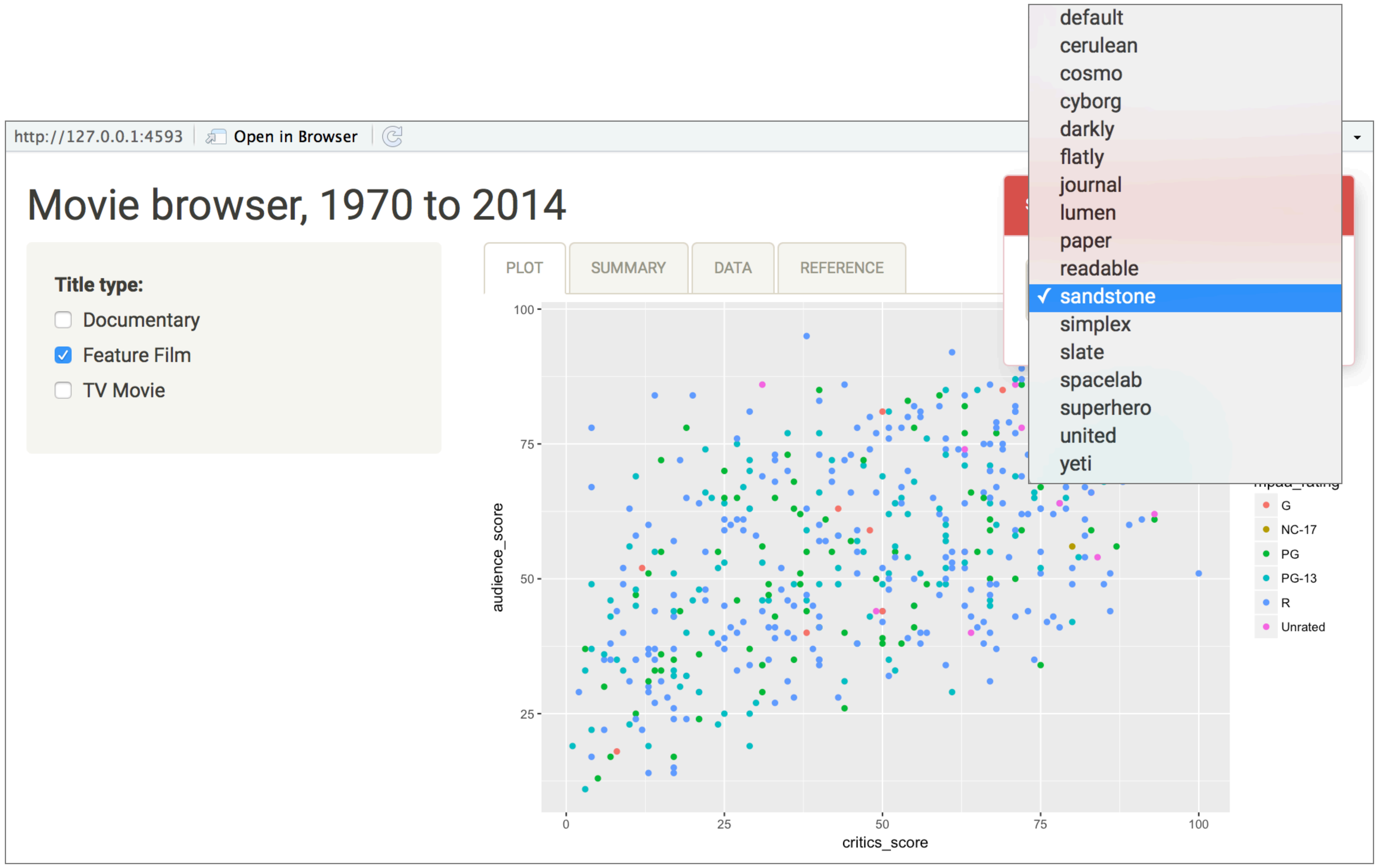

Cerulean
Cosmo
Cyborg
Darkly
Flatly
JOURNAL
Lumen
Paper
Readable
Sandstone
Simplex
Slate
Spacelab
Superhero
United
Yeti
Header 1
Header 2
Header 3
Header 4
Header 5

SANDSTONE

shinythemes

```
library(shiny)
library(shinythemes)

ui <- fluidPage(
  themeSelector(),
  ...
)
```



Your turn

- Continue working on movies_11.R.
- Add the theme selector, browse various themes, and pick a theme and apply it.
  - Don’t forget to remove the selector once you’re done picking a theme.
- Add an theme= argument to fluidPage( ) to implement the theme.

5m 00s