Inputs

BUILDING WEB APPLICATIONS WITH SHINY IN R

Kaelen Medeiros
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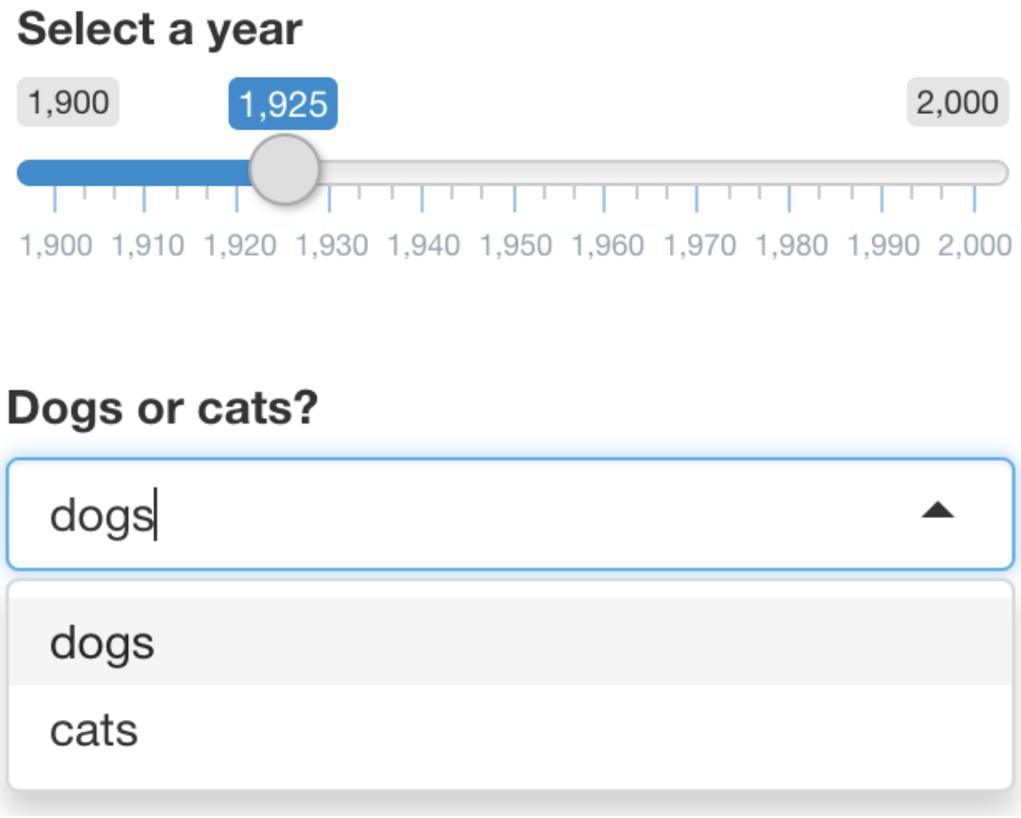
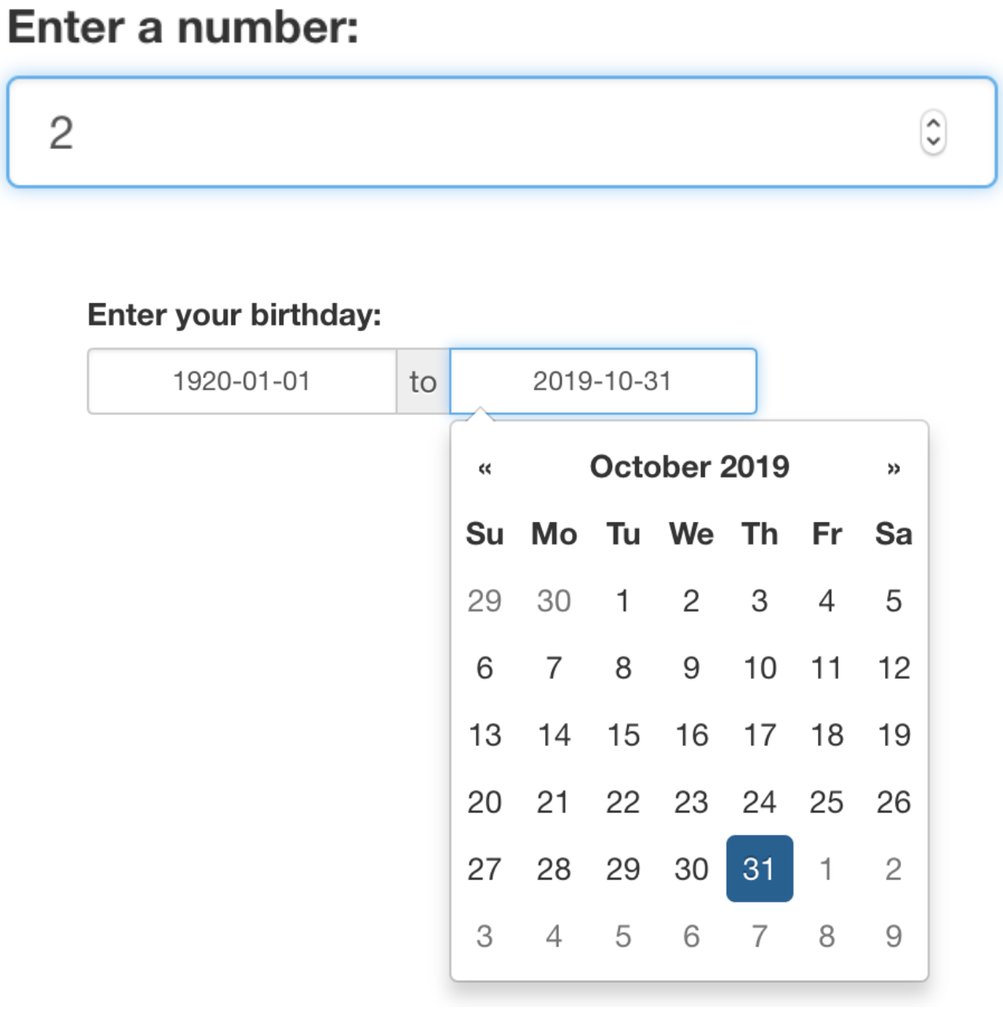
datacamp

Example inputs

Shiny provides a variety of inputs to choose from.





Input functions

```
selectInput("inputId",
            "label",
            choices = c("A", "B", "C"))
```

```
sliderInput("inputId",
            "label",
            value = 1925,
            min = 1900,
            max = 2000)
```

```
?dateRangeInput
help(checkboxInput)
```

Where to use inputs

```
ui <- fluidPage(
  textInput("name", "Enter a name:"),
  selectInput("animal", "Dogs or cats?", choices = c("dogs", "cats")),
  textOutput("greeting"),
  textOutput("answer")
)
server <- function(input, output, session) {
  output$greeting <- renderText({
    paste("Do you prefer dogs or cats,", input$name, "?")
  })
  output$answer <- renderText({
    paste("I prefer", input$animal, "!")
  })
}
```

Let's practice!

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Outputs

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Render functions

```
ui <- fluidPage(
  textInput("name", "Enter a name:"),
  selectInput("animal", "Dogs or cats?", choices = c("dogs", "cats")),
  textOutput("question"),
  textOutput("answer")
)

server <- function(input, output, session) {
  output$question <- renderText({
    paste("Do you prefer dogs or cats,", input$name, "?")
  })
  output$answer <- renderText({
    paste("I prefer", input$animal, "!")
  })
}
```

Other render functions

- `renderTable()`
- `renderImage()`
- `renderPlot()`
- **Shiny documentation**

Output functions

```
ui <- fluidPage(
  textInput("name", "Enter a name:"),
  selectInput("animal", "Dogs or cats?", choices = c("dogs", "cats")),
  textOutput("question"),
  textOutput("answer")
)
```

Other output functions

- `tableOutput()` or `dataTableOutput`
- `imageOutput()`
- `plotOutput()`

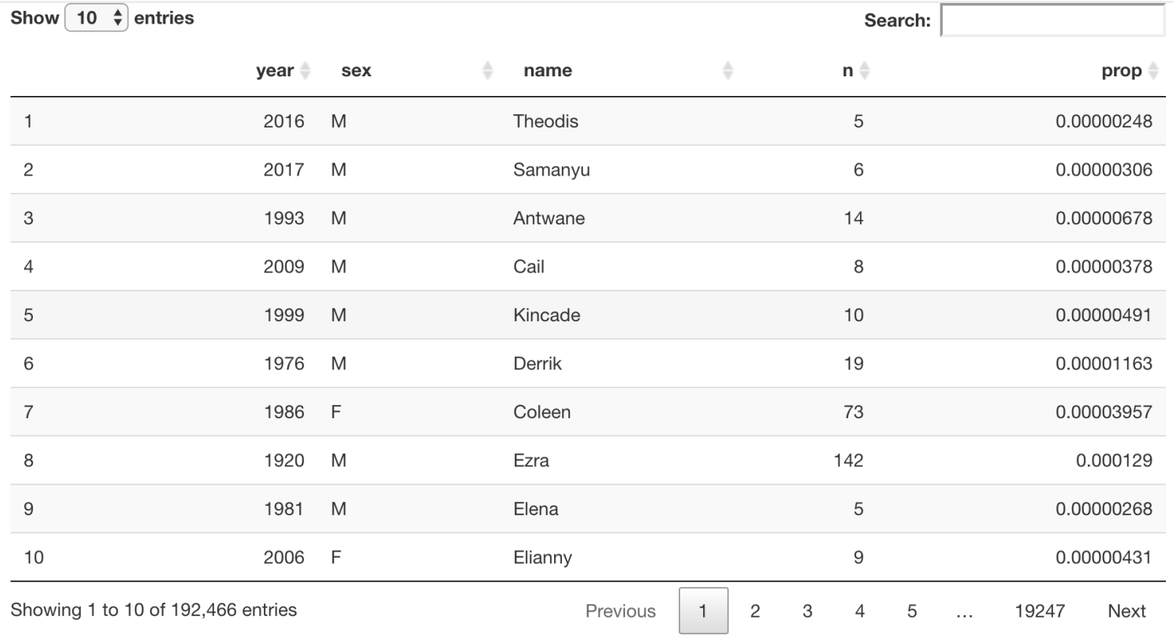
Non-Shiny output and render functions

```
library(shiny)
library(babynames)

ui <- fluidPage(
  DT::DTOutput("babynames_table")
)

server <- function(input, output){
  output$babynames_table <- DT::renderDT({
    babynames %>%
      dplyr::slice_sample(prop = .1) %>%
      DT::datatable()
  })
}

shinyApp(ui = ui, server = server)
```



Show 10 entries Search:

	year	sex	name	n	prop
1	2016	M	Theodis	5	0.00000248
2	2017	M	Samanyu	6	0.00000306
3	1993	M	Antwane	14	0.00000678
4	2009	M	Cail	8	0.00000378
5	1999	M	Kincade	10	0.00000491
6	1976	M	Derrik	19	0.00001163
7	1986	F	Coleen	73	0.00003957
8	1920	M	Ezra	142	0.000129
9	1981	M	Elena	5	0.00000268
10	2006	F	Elianny	9	0.00000431

Showing 1 to 10 of 192,466 entries Previous 1 2 3 4 5 … 19247 Next

Let's practice!

BUILDING WEB APPLICATIONS WITH SHINY IN R

Layouts and themes

BUILDING WEB APPLICATIONS WITH SHINY IN R

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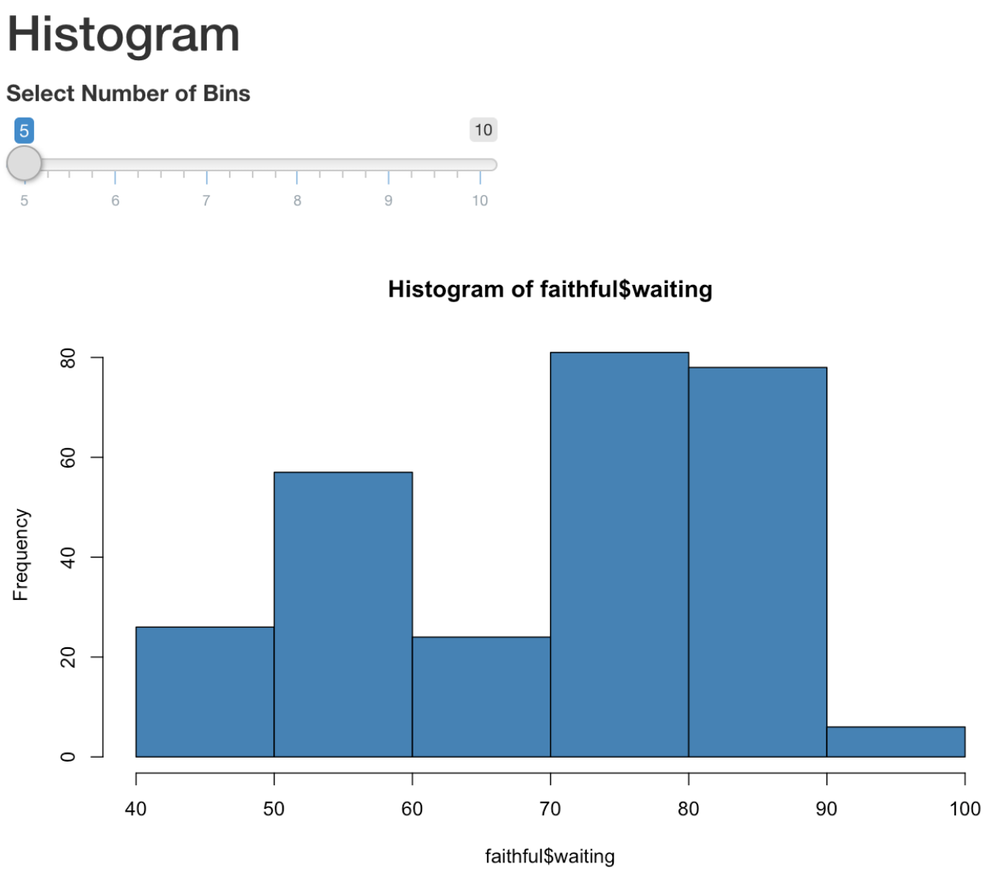
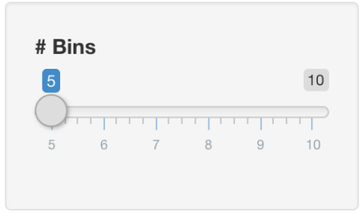
Default Shiny app layout

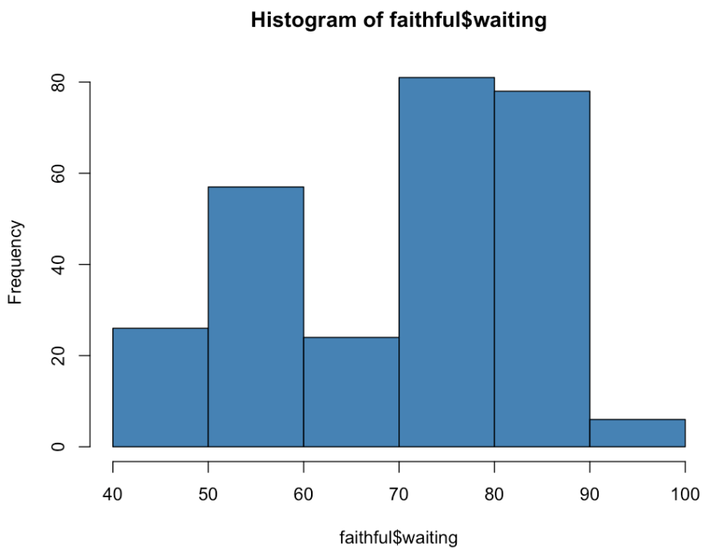
```
ui <- fluidPage(
  titlePanel("Histogram"),
  sliderInput('nb_bins', '# Bins', 5, 10, 5),
  plotOutput('hist')
)
server <- function(input, output, session){
  output$hist <- renderPlot({
    hist(faithful$waiting,
         breaks = input$nb_bins,
         col = 'steelblue')
  })
}
shinyApp(ui = ui, server = server)
```



Sidebar layout

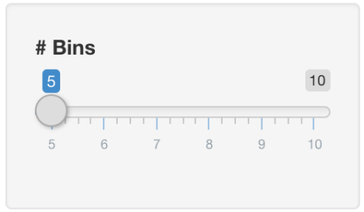
```
ui <- fluidPage(
  titlePanel("Histogram"),
  sidebarLayout(
    sidebarPanel(sliderInput('nb_bins',
                             '# Bins', 5, 10, 5)),
    mainPanel(plotOutput('hist'))
  )
)
server <- function(input, output, session){
  output$hist <- renderPlot({
    hist(faithful$waiting, breaks = input$nb_bins,
         col = 'steelblue')
  })
}
shinyApp(ui = ui, server = server)
```

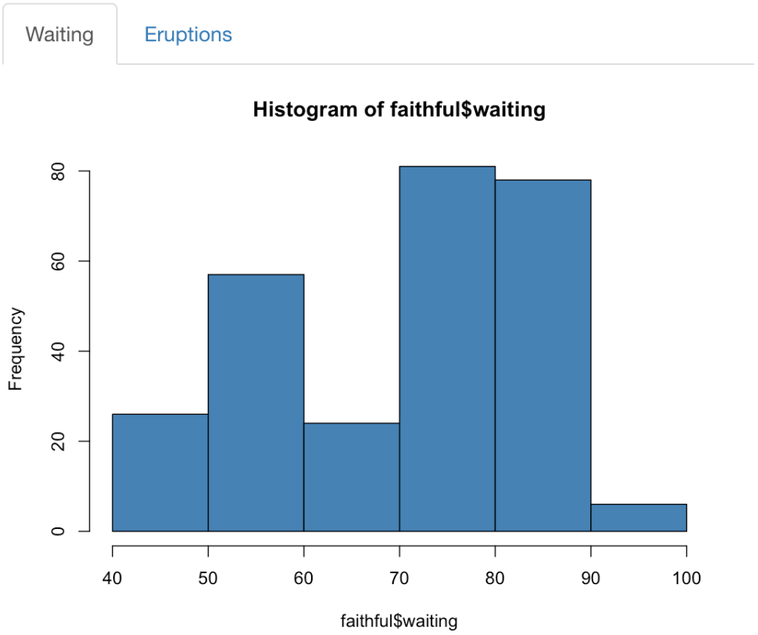




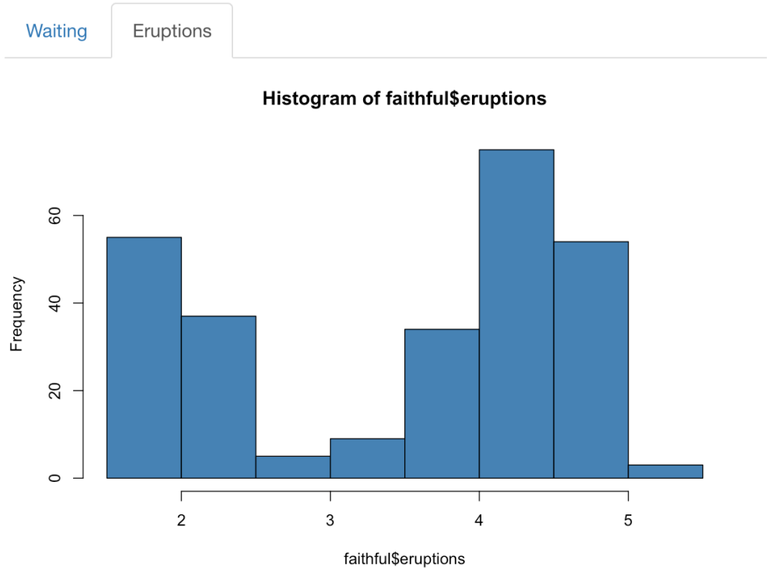
Tab layout

Histogram





Histogram



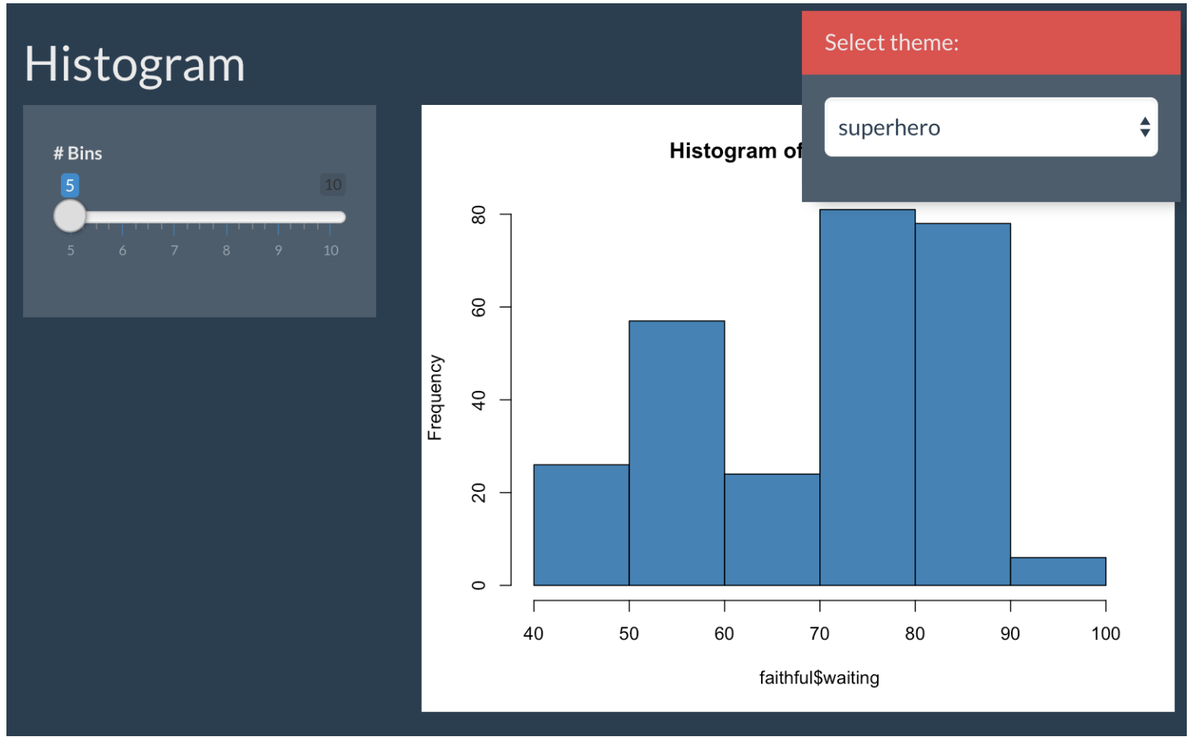
Tab layout

```
ui <- fluidPage(
  titlePanel("Histogram"),
  sidebarLayout(
    sidebarPanel(sliderInput('nb_bins', '# Bins',
                             5, 10, 5)),
    mainPanel(
      tabsetPanel(
        tabPanel('Waiting',
                 plotOutput('hist_waiting')),
        tabPanel('Eruptions',
                 plotOutput('hist_eruptions'))
      )
    )
  )
)
```

```
server <- function(input, output, session){
  output$hist_waiting <- renderPlot({
    hist(faithful$waiting,
         breaks = input$nb_bins,
         col = 'steelblue')
  })
  output$hist_eruptions <- renderPlot({
    hist(faithful$eruptions,
         breaks = input$nb_bins,
         col = 'steelblue')
  })
}
shinyApp(ui = ui, server = server)
```

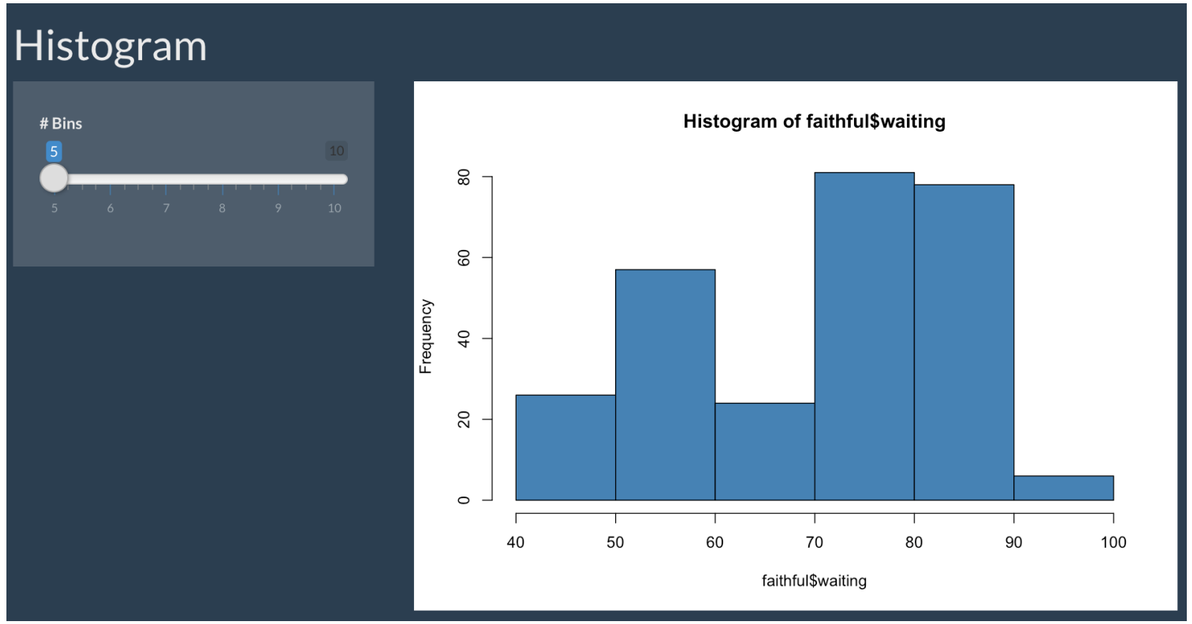
Theme selector

```
ui <- fluidPage(
  titlePanel("Histogram"),
  shinythemes::themeSelector(),
  sidebarLayout(
    sidebarPanel(sliderInput('nb_bins', '# Bins',
                             5, 10, 5)),
    mainPanel(plotOutput('hist'))
  )
)
server <- function(input, output, session){
  output$hist <- renderPlot({
    hist(faithful$waiting, breaks = input$nb_bins,
         col = 'steelblue')
  })
}
shinyApp(ui = ui, server = server)
```



Adding a theme

```
ui <- fluidPage(
  titlePanel("Histogram"),
  theme = shinythemes::shinytheme('superhero'),
  sidebarLayout(
    sidebarPanel(sliderInput('nb_bins', '# Bins',
                             5, 10, 5)),
    mainPanel(plotOutput('hist'))
  )
)
server <- function(input, output, session){
  output$hist <- renderPlot({
    hist(faithful$waiting, breaks = input$nb_bins,
         col = 'steelblue')
  })
}
shinyApp(ui = ui, server = server)
```



Let's practice!

BUILDING WEB APPLICATIONS WITH SHINY IN R

Building apps

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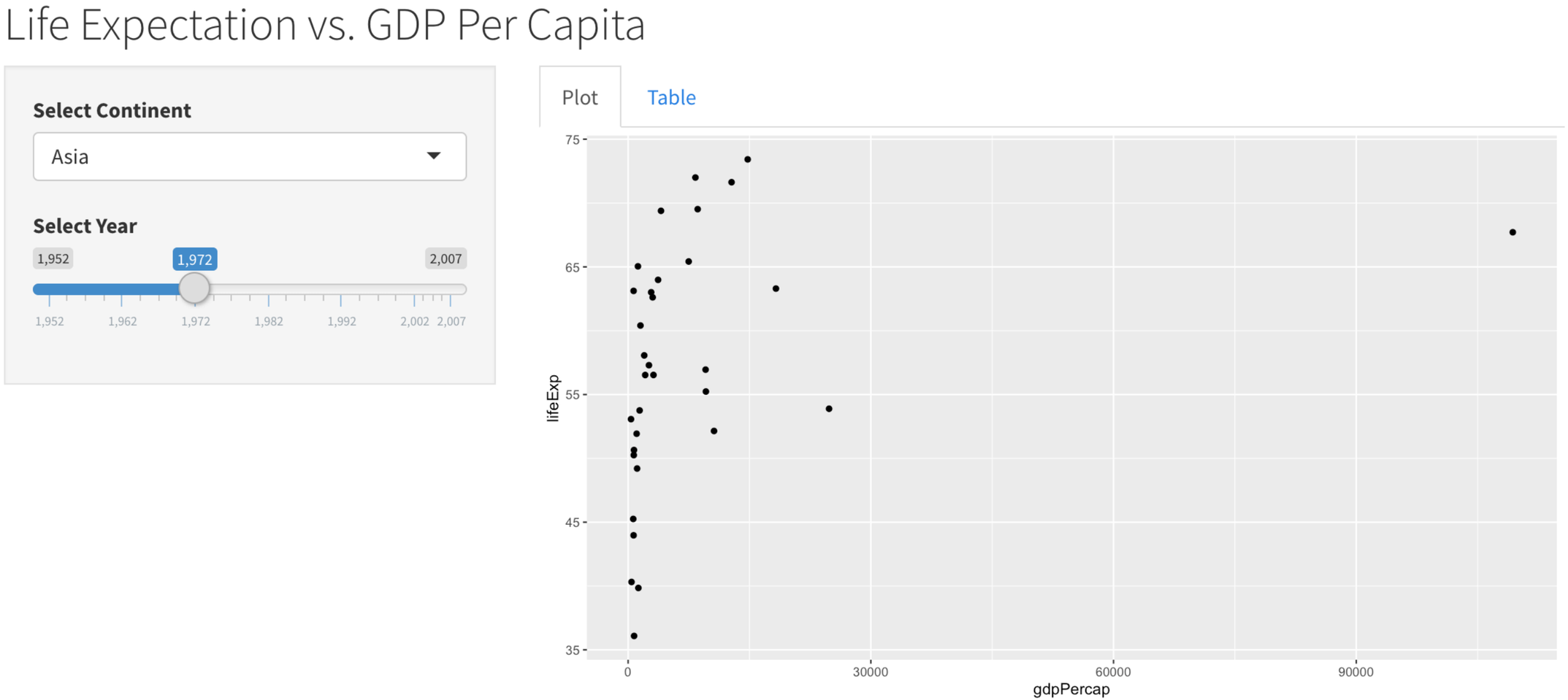
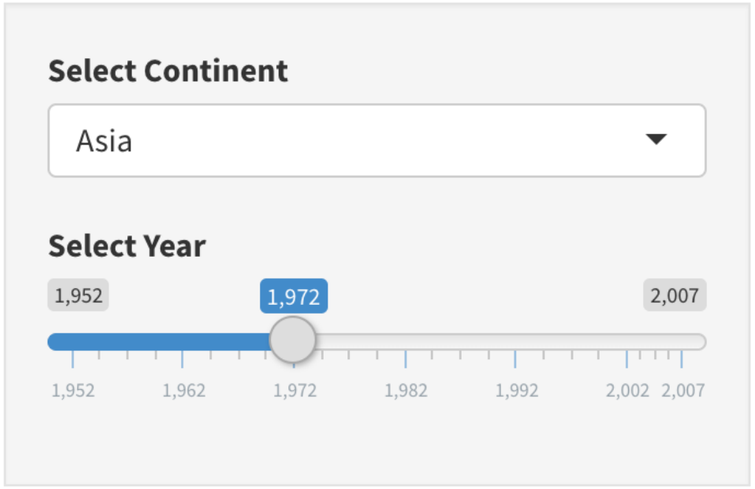
Explore Life Expectation vs. GDP per Capita



Explore Life Expectation vs. GDP per Capita

Life Expectation vs. GDP Per Capita



Plot | Table

Show 10 entries Search:

	country	continent	year	lifeExp	pop	gdpPercap
1	Afghanistan	Asia	1972	36.088	13079460	739.9811058
2	Bahrain	Asia	1972	63.3	230800	18268.65839
3	Bangladesh	Asia	1972	45.252	70759295	630.2336265
4	Cambodia	Asia	1972	40.317	7450606	421.6240257
5	China	Asia	1972	63.11888	862030000	676.9000921
6	Hong Kong, China	Asia	1972	72	4115700	8315.928145
7	India	Asia	1972	50.651	567000000	724.032527
8	Indonesia	Asia	1972	49.203	121282000	1111.107907

Building Shiny apps: 4 steps

1. Add inputs (UI)
2. Add outputs (UI/Server)
3. Update layout (UI)
4. Update outputs (Server)

Step 1: Add inputs (UI)

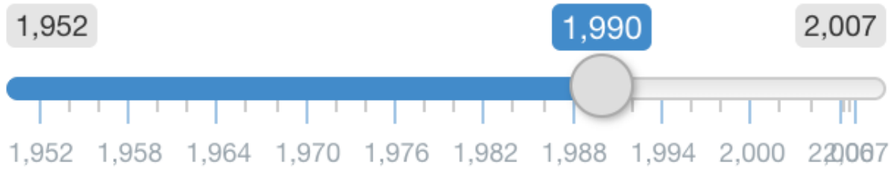
```
ui <- fluidPage(
  titlePanel("Life Expectation vs. GDP Per Capita"),
  selectInput('continent', 'Select Continent', unique(gapminder$continent)),
  sliderInput('year', 'Select Year', 1952, 2007, 1990, step = 5)
)
server <- function(input, output, session){


}
shinyApp(ui = ui, server = server)
```

Life Expectation vs. GDP Per Capita

Select Continent

Asia

Select Year



Step 2: Add outputs (UI)

```
ui <- fluidPage(
  titlePanel("Life Expectation vs. GDP Per Capita"),
  selectInput('continent', 'Select Continent', unique(gapminder$continent)),
  sliderInput('year', 'Select Year', 1952, 2007, 1990, step = 5),
  plotOutput('plot'),
  DT::DTOutput('table')
)
```

Step 2: Add outputs (Server)

```
server <- function(input, output, session){
  output$plot <- renderPlot({
    ggplot()
  })
  output$table <- DT::renderDT({
    gapminder
  })
}
```

Life Expectation vs. GDP Per Capita

Select Continent

Asia

Select Year

1,952 1,990 2,007

1,952 1,958 1,964 1,970 1,976 1,982 1,988 1,994 2,000 2,007

Show 10 **entries**

	country	continent	year	lifeExp
1	Afghanistan	Asia	1952	28.801
2	Afghanistan	Asia	1957	30.332

Step 3: Update layout (UI)

```
ui <- fluidPage(
  titlePanel("Life Expectation vs. GDP Per Capita"),
  sidebarLayout(
    sidebarPanel(
      selectInput('continent', 'Select Continent', unique(gapminder$continent)),
      sliderInput('year', 'Select Year', 1952, 2007, 1990, step = 5)
    ),
    mainPanel(
      plotOutput('plot'),
      DT::DTOutput('table')
    )
  )
)
```

Step 3: Update layout (UI)

```
ui <- fluidPage(
  titlePanel("Life Expectation vs. GDP Per Capita"),
  sidebarLayout(
    sidebarPanel(
      selectInput('continent', 'Select Continent', unique(gapminder$continent)),
      sliderInput('year', 'Select Year', 1952, 2007, 1990, step = 5)
    ),
    mainPanel(
      tabsetPanel(
        tabPanel("Plot", plotOutput('plot')),
        tabPanel("Table", DT::DTOutput('table'))
      )
    )
  )
)
```

Life Expectation vs. GDP Per Capita

Select Continent

Asia

Select Year

1,952 1,990 2,007

1,952 1,964 1,976 1,988 2,000 2,007

Plot | Table

Show 10 entries Search:

	country	continent	year	lifeExp	pop	gdpPercap
1	Afghanistan	Asia	1952	28.801	8425333	779.4453145
2	Afghanistan	Asia	1957	30.332	9240934	820.8530296
3	Afghanistan	Asia	1962	31.997	10267083	853.10071
4	Afghanistan	Asia	1967	34.02	11537966	836.1971382
5	Afghanistan	Asia	1972	36.088	13079460	739.9811058
6	Afghanistan	Asia	1977	38.438	14880372	786.11336
7	Afghanistan	Asia	1982	39.854	12881816	978.0114388
8	Afghanistan	Asia	1987	40.822	13867957	852.3959448

Step 4: Update outputs (Server)

```
server <- function(input, output, session){
  output$plot <- renderPlot({
    data <- gapminder %>%
      filter(year == input$year) %>%
      filter(continent == input$continent)
    print(data)
    ggplot(data, aes(x = gdpPercap, y = lifeExp)) +
      geom_point()
  })
  output$table <- DT::renderDT({
    gapminder %>%
      filter(year == input$year) %>%
      filter(continent == input$continent)
  })
}
```

Life Expectation vs. GDP Per Capita

Select Continent

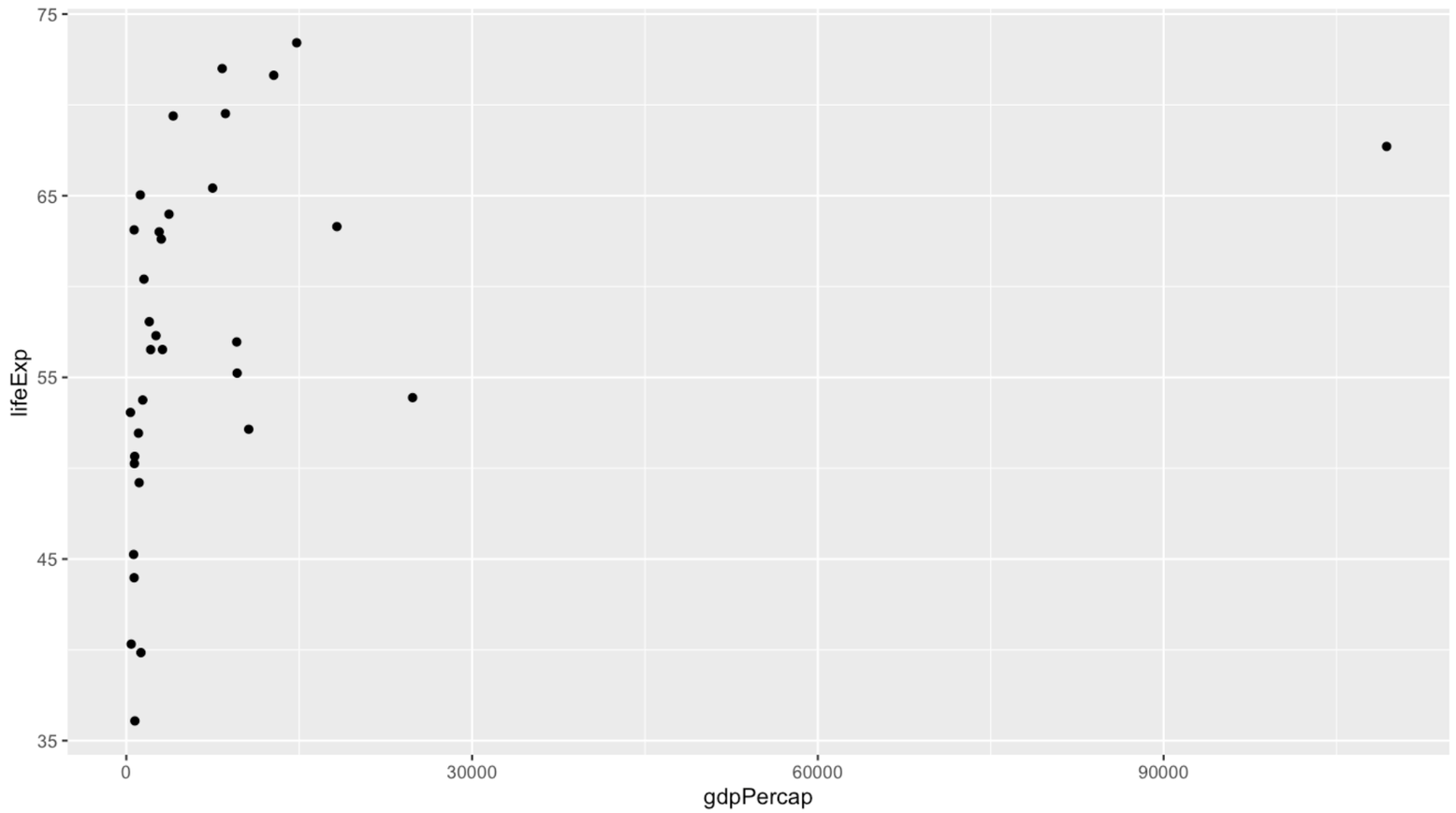
Asia

Select Year

1,952 1,972 2,007

1,952 1,962 1,972 1,982 1,992 2,002 2,007

Plot Table



Let's practice!

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