



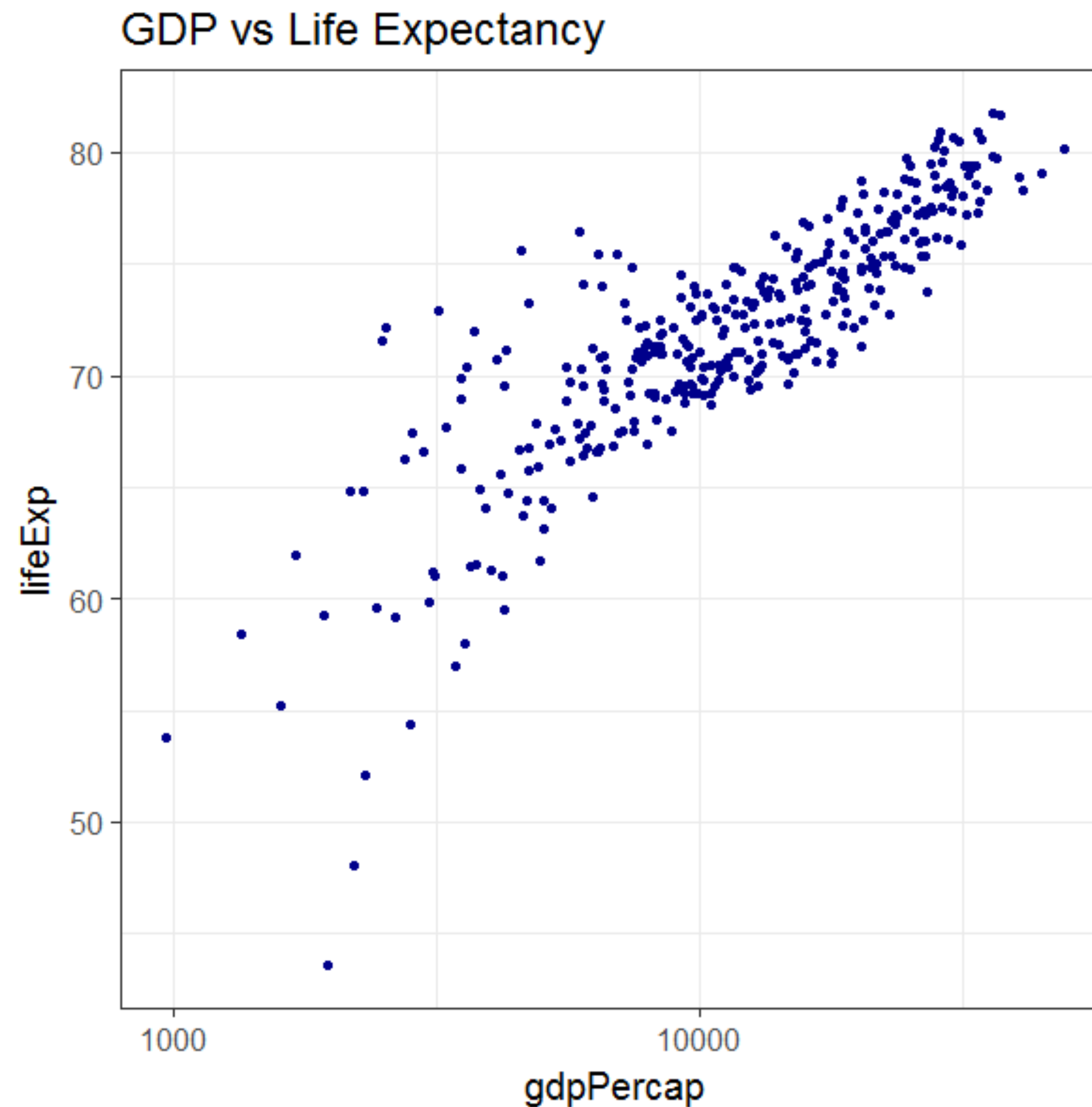
BUILDING WEB APPLICATIONS IN R WITH SHINY: CASE STUDIES

Make the perfect plot using Shiny

Dean Attali
Shiny Consultant

Re-plotting using R code

```
make_figure(  
  data    = data2,  
  size    = 2,  
  colour  = "darkblue",  
  title   =  
    "GDP vs Life Expectancy"  
)
```



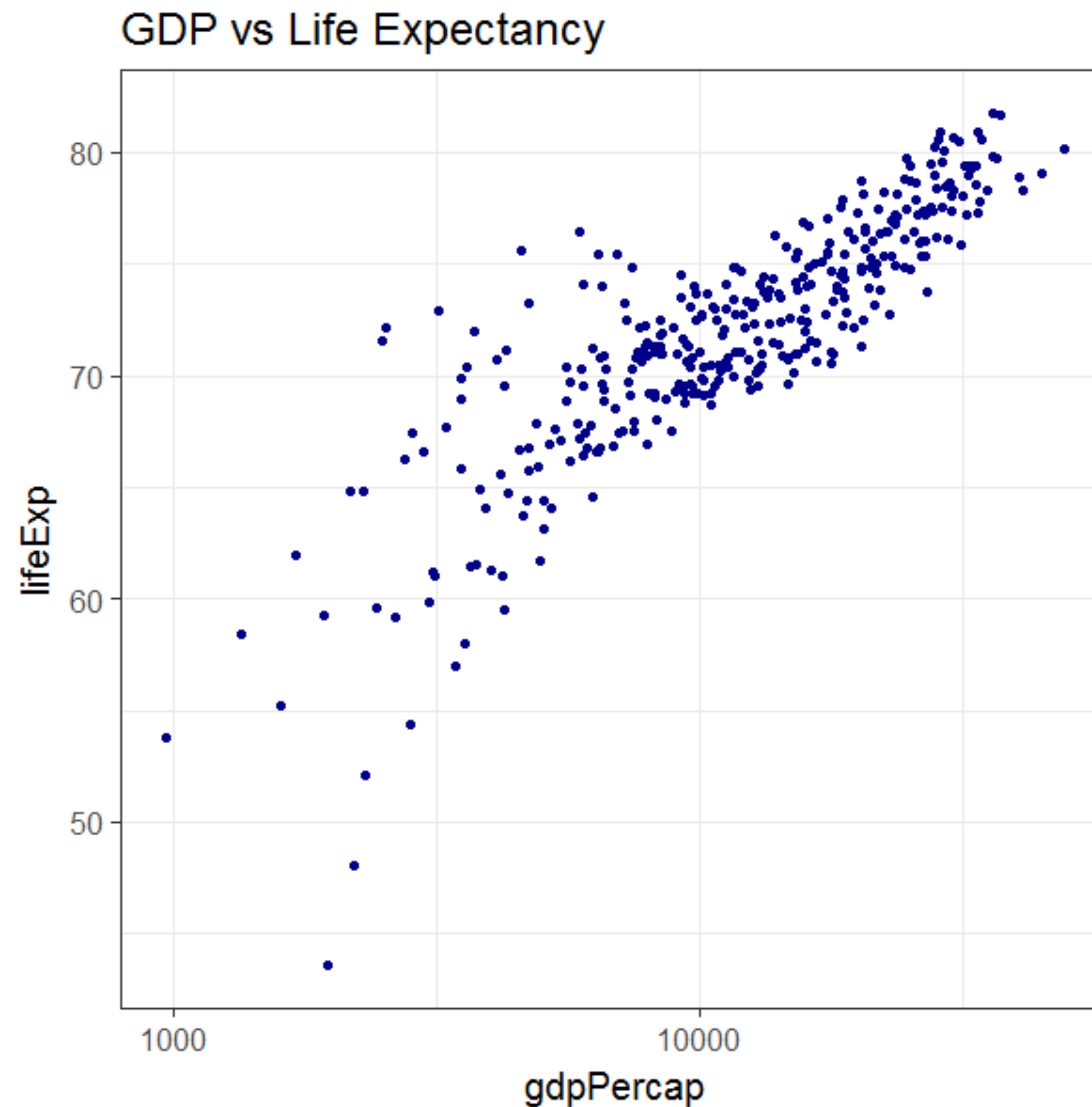
Re-plotting using Shiny

Title
GDP vs Life Expectancy

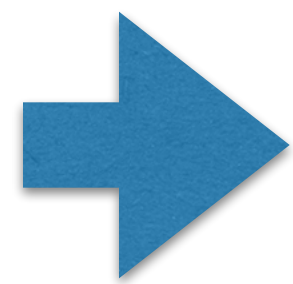
Point size
2

Point colour
darkblue

Continents
Europe ▼



Gapminder dataset



country	continent	year	lifeExp	pop	gdpPercap
Netherlands	Europe	2002	78.530	16122830	33724.758
Turkey	Europe	1987	63.108	52881328	5089.044
Oman	Asia	1987	67.734	1593882	18115.223
Jamaica	Americas	1982	71.210	2298309	6068.051
Algeria	Africa	1967	51.407	12760499	3246.992

Gapminder package

```
> library(gapminder)
```

```
> min(gapminder$pop)
[1] 60011
```

```
> max(gapminder$pop)
[1] 1318683096
```

```
> subset(gapminder, country == "Canada" & year < 1965)
  country continent year lifeExp      pop gdpPercap
241  Canada  Americas 1952   68.75 14785584  11367.16
242  Canada  Americas 1957   69.96 17010154  12489.95
243  Canada  Americas 1962   71.30 18985849  13462.49
```

```
> subset(gapminder, country == "Canada" & year == 1962)$lifeExp
[1] 71.3
```



BUILDING WEB APPLICATIONS IN R WITH SHINY: CASE STUDIES

Let's practice!

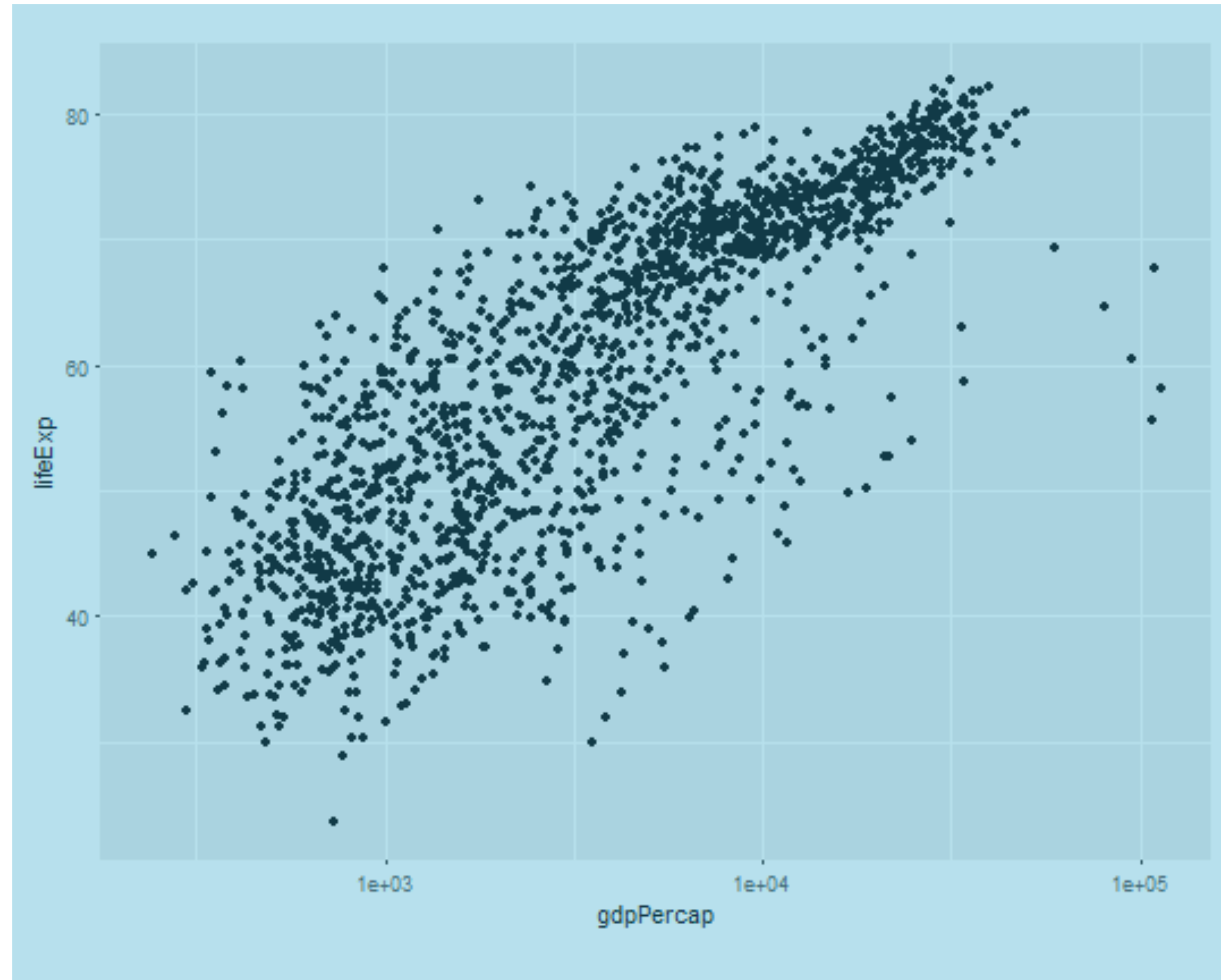
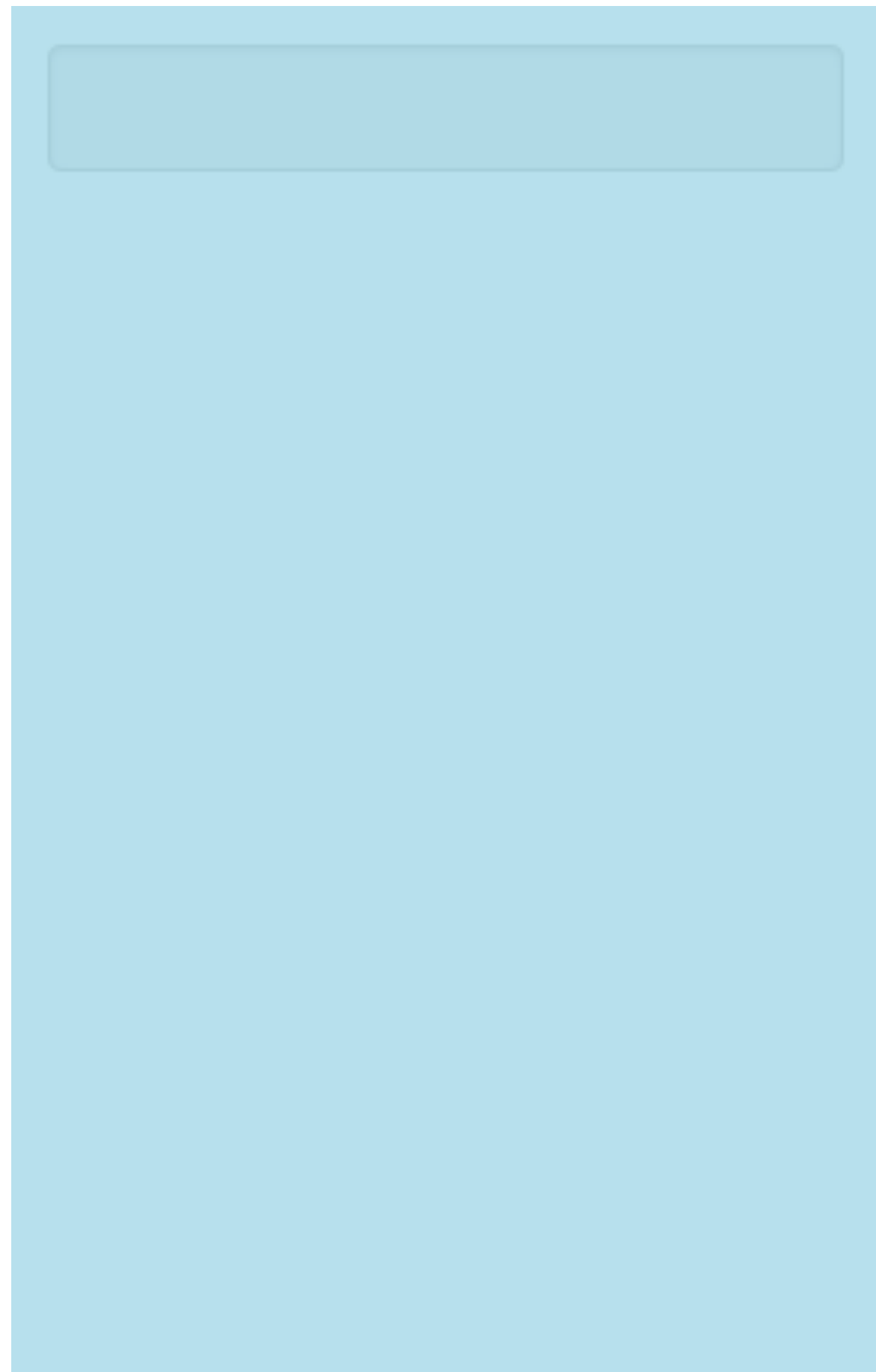


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Adding simple inputs to modify a plot

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Gapminder plot app

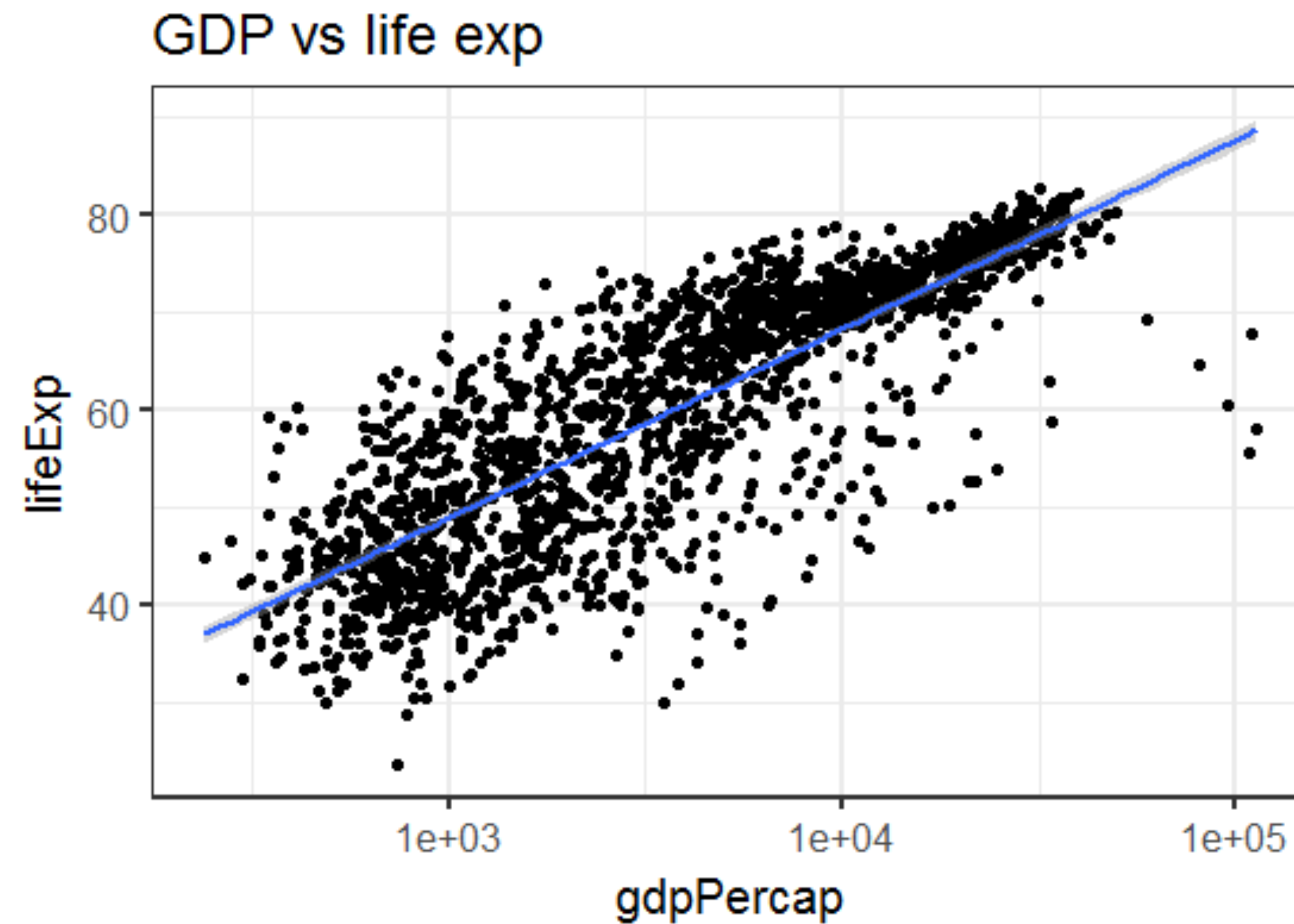


Gapminder plot app

Title
GDP vs life exp

Point size
2

☒ Add line of best fit



Text inputs

```
ui <- fluidPage(  
  textInput(inputId = "package",  
            label = "What's your favourite R package?",  
            value = "shiny")  
)  
  
server <- function(input, output) {}  
shinyApp(ui, server)
```

What's your favourite R package?

```
> str(input$package)  
chr "shiny"
```

Numeric inputs

```
numericInput("years", "How many years have you been using R?",  
             value = 4, min = 0, max = 25)
```

How many years have you been using R?

```
> str(input$years)  
int 4
```

Checkbox inputs

```
checkboxInput("agree", "I agree to the terms and conditions",  
          value = TRUE)
```

☒ I agree to the terms and conditions

```
> str(input$agree)  
logi TRUE
```



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Let's practice!



BUILDING WEB APPLICATIONS IN R WITH SHINY: CASE STUDIES

More input types

Dean Attali
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Gapminder plot app

Title

GDP vs life exp

Point size

3

☒ Add line of best fit

Point colour

☐ blue

☒ red

☐ green

☐ black

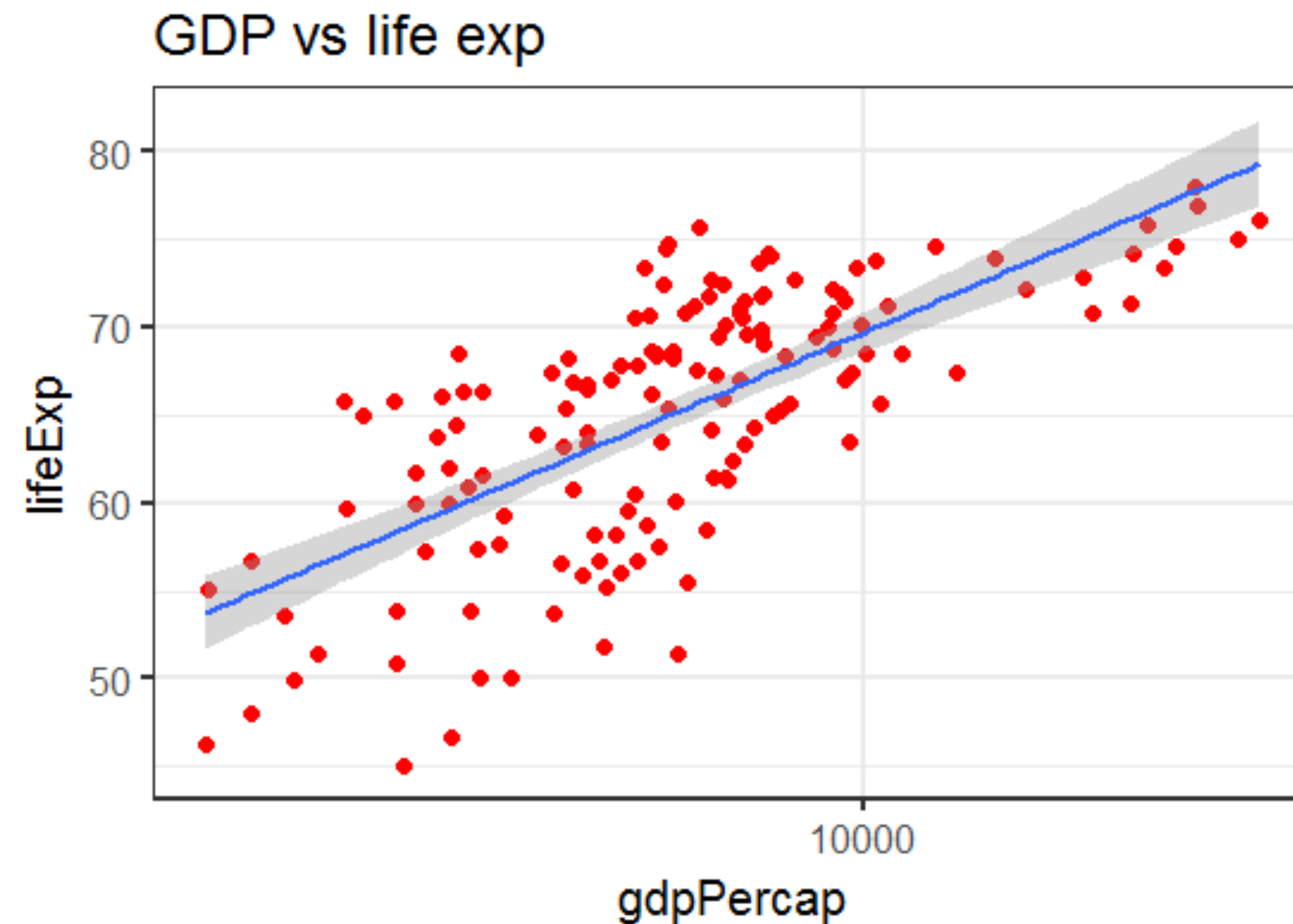
Continents

Americas

Years

1,952 1,967 1,992 2,007

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

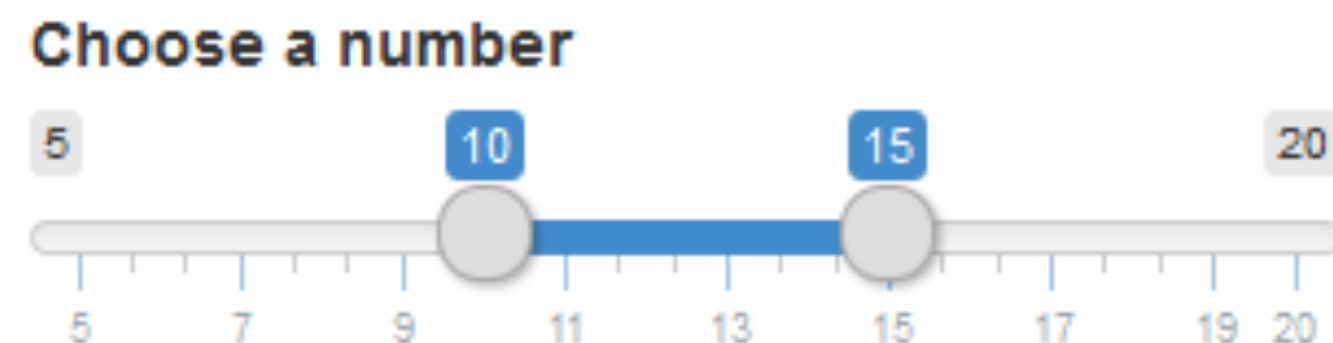


Slider inputs

```
sliderInput("slider", "Choose a number",  
            value = 15, min = 5, max = 20)
```



```
sliderInput("slider2", "Choose a number",  
            value = c(10, 15), min = 5, max = 20)
```



```
> str(input$slider2)  
num [1:2] 10 15
```


Radio buttons

```
radioButtons("radio", "Choose your favourite time of day",  
             choices = c("Morning", "Afternoon", "Evening"),  
             selected = "Afternoon")
```

Choose your favourite time of day

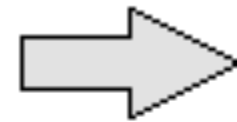
- ☐ Morning
- ☒ Afternoon
- ☐ Evening

Select inputs (dropdowns)

```
selectInput("select", "Choose your favourite time of day",  
            choices = c("Morning", "Afternoon", "Evening"),  
            selected = "Afternoon")
```

Choose your favourite time of day

Afternoon ▼



Choose your favourite time of day

Afternoon ▲

Morning

Afternoon

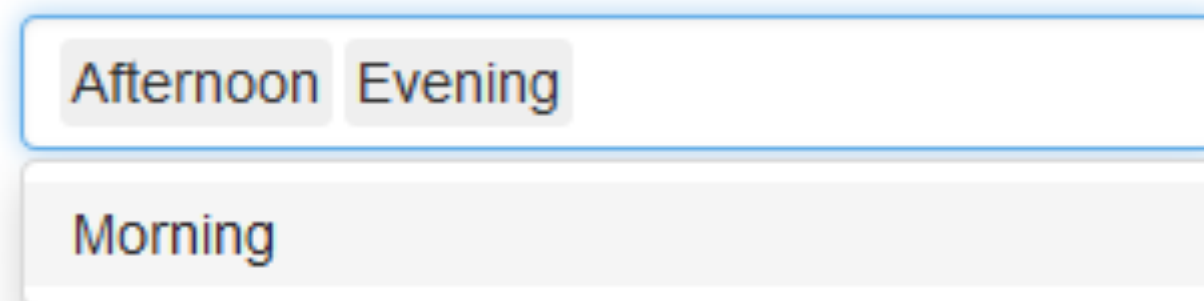
Evening

Select inputs (dropdowns)

Allow multiple selections

```
selectInput("select", "Choose your favourite time of day",  
            choices = c("Morning", "Afternoon", "Evening"),  
            selected = c("Afternoon", "Evening"),  
            multiple = TRUE)
```

Choose your favourite time of day



Afternoon Evening

Morning

Radio buttons vs select inputs

Radio buttons

- Few options
- All options are visible
- Exactly one option selected

Choose your favourite time of day

- ☐ Morning
- ☒ Afternoon
- ☐ Evening

Select inputs

- Few or many options
- Harder to see all options
- Multiple options can be selected

Choose your favourite time of day

Afternoon ▲

Morning

Afternoon

Evening



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Advanced features to improve your plot

Dean Attali
Shiny Consultant

Colour input

```
library(colourpicker)

colourInput("col", "Select a colour", value = "orange")
```

Select a colour

#FFA500



Select a colour

#FFA500

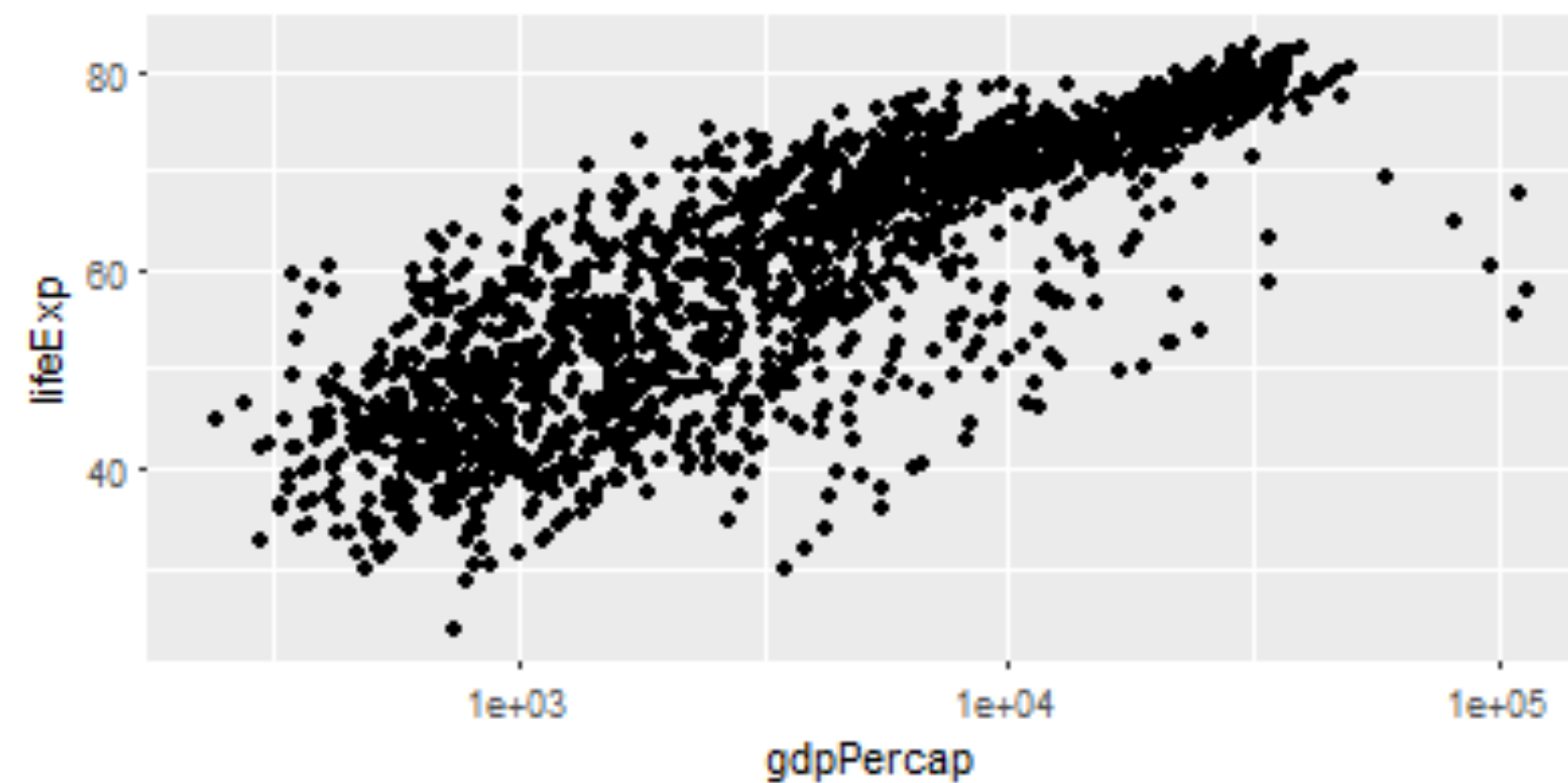
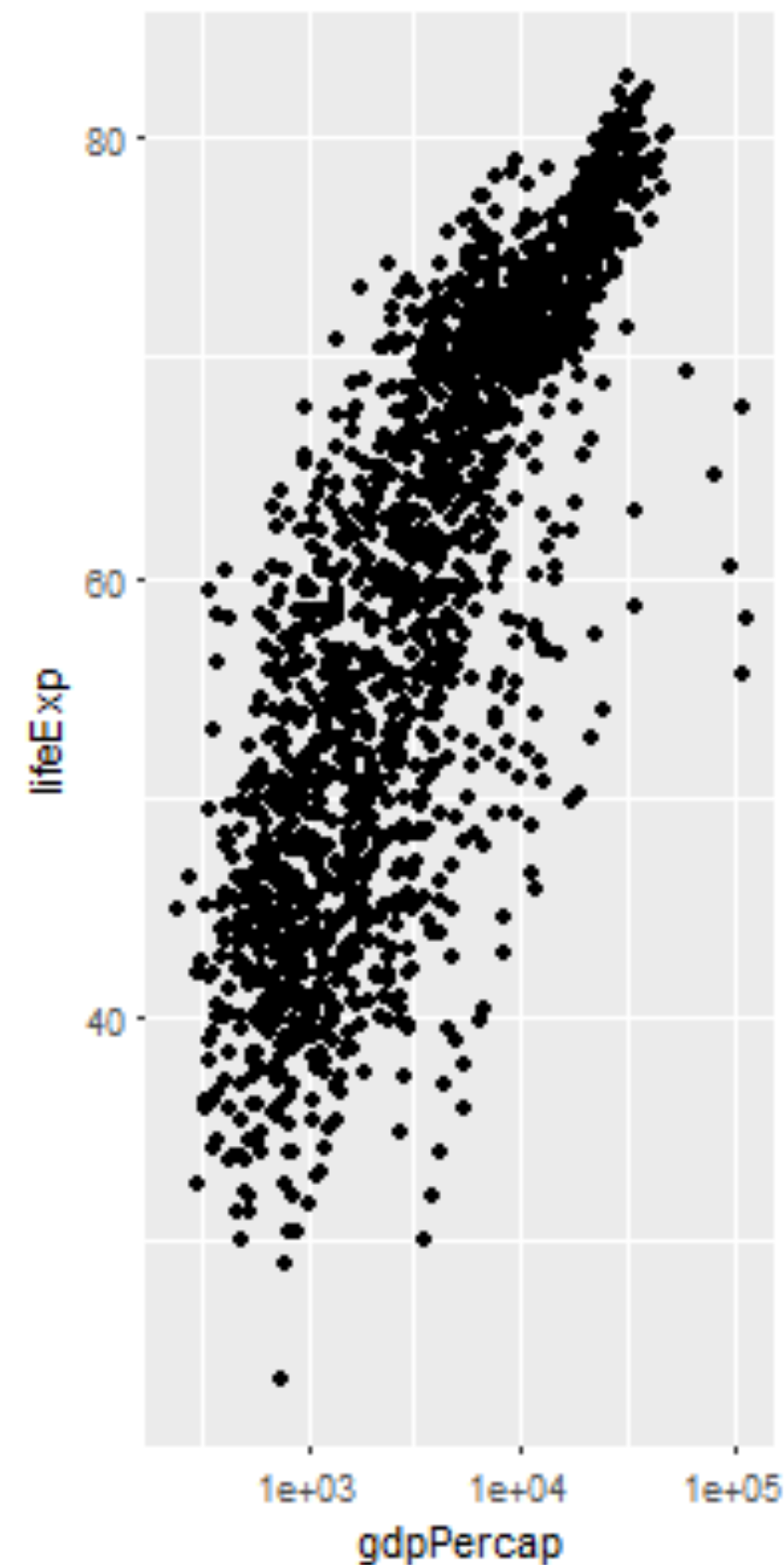


Outputs can have arguments

```
plotOutput(outputId, width = "100%", height = "400px",  
            click = NULL, dblclick = NULL, hover = NULL,  
            hoverDelay = NULL, hoverDelayType = NULL,  
            brush = NULL, clickId = NULL, hoverId = NULL,  
            inline = FALSE)
```

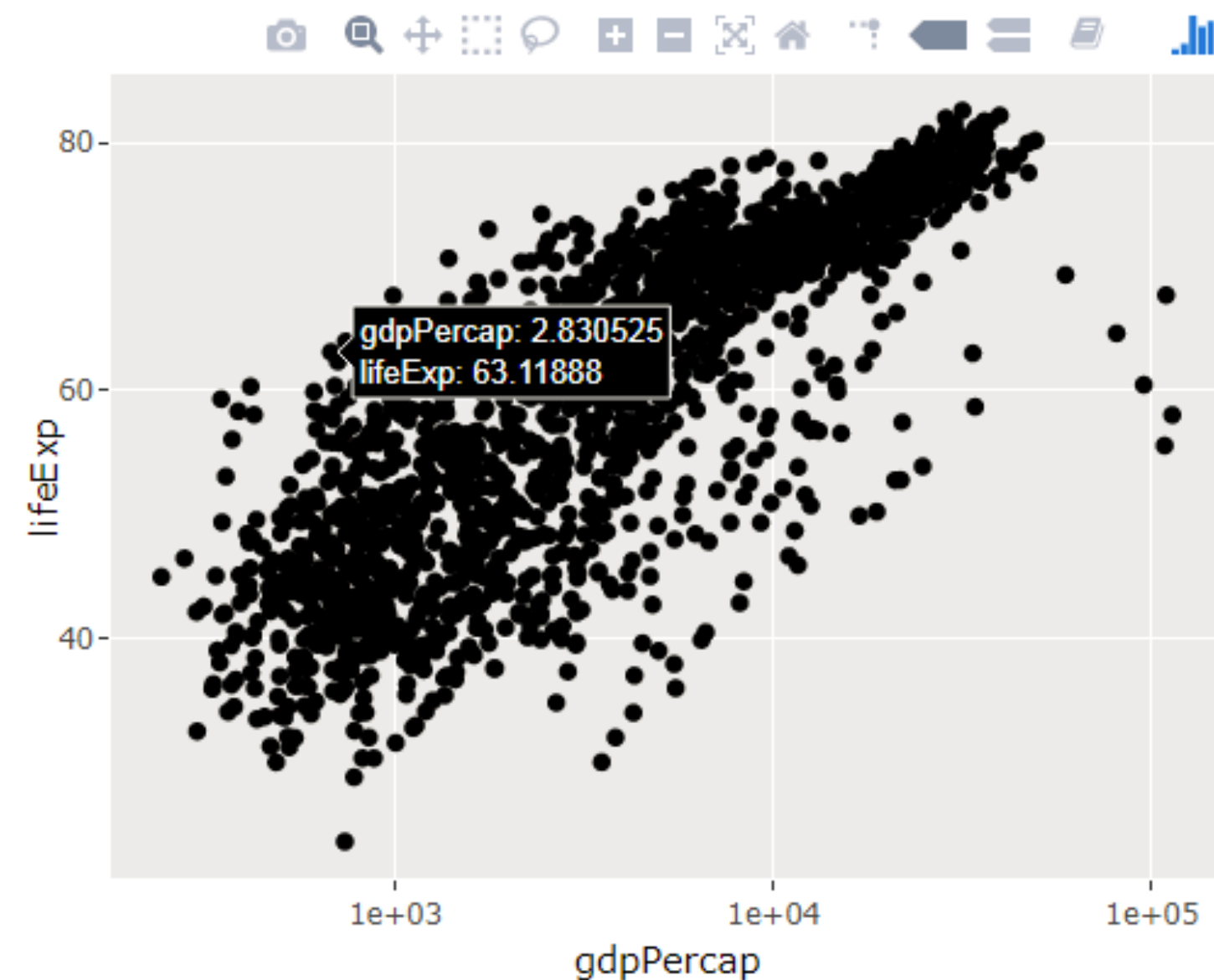

Plot output arguments

```
plotOutput("plot1", width = 200, height = 400)  
plotOutput("plot2", width = 400, height = 200)
```



Interactive plots with plotly

- Many packages for interactive plots
- `plotly` is popular choice
- `ggplotly()`:
`ggplot2` plot \Rightarrow interactive



```
> p <- ggplot(gapminder,  
+           aes(gdpPerCap, lifeExp)) +  
+   geom_point() +  
+   scale_x_log10()  
  
> library(plotly)  
> ggplotly(p)
```

Plotly in Shiny

Incorrect

```
plotOutput("plot")
```

```
renderPlot(ggplotly(p))
```

Correct

```
plotlyOutput("plot")
```

```
renderPlotly(ggplotly(p))
```



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