BUILDING WEB APPLICATIONS IN R WITH SHINY: CASE STUDIES

Word clouds in Shiny

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Word clouds

- Visual representation of text
- BIG WORDS = COMMON, small words = rare

Word clouds in R - function

Created by your friend:

```
create_wordcloud(data, num_words = 100, background = "white")
```

- `data`: text to use in word cloud
  - Single string:
    `data = “Some very long story”`
  - List of strings:
    `data = c(“Some very”, “long story”)`
- `num_words`: maximum number of words
- `background`: background colour

Word clouds in R - usage

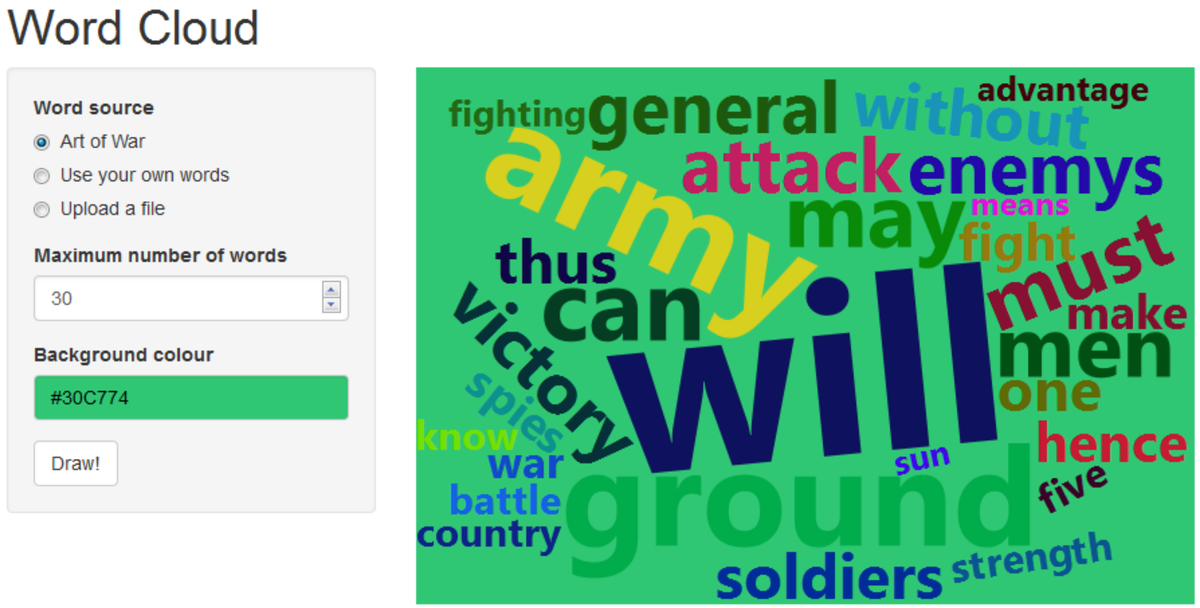
```
us_constitution <- “We the People of the United States, ...”
```

```
create_wordcloud(data = us_constitution,
                 num_words = 15,
                 background = "yellow")
```

Word clouds: from R to Shiny

- `create_wordcloud()` requires R knowledge to use
- Create Shiny app ⇒ anyone can create word cloud

Word clouds in Shiny



- Word clouds are new type of output
- `wordcloud2Output()` + `renderWordcloud2()`

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Let’s practice!

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Adding word sources

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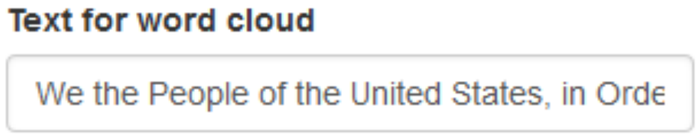
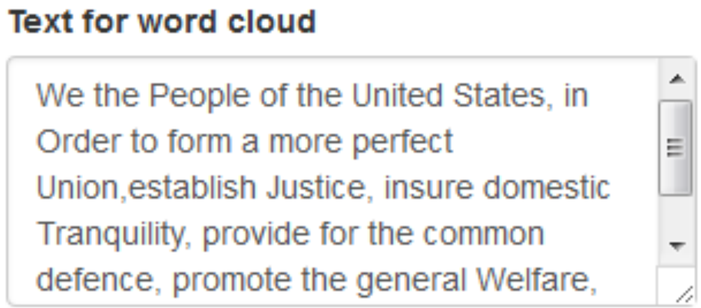
Textarea inputs

- `data` argument is text, use `textInput()`?



- `textAreaInput()` similar, but provides multiple rows

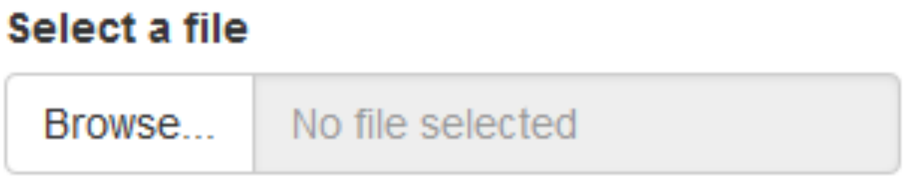
```
textAreaInput(inputId, label, value, rows, ...)
```



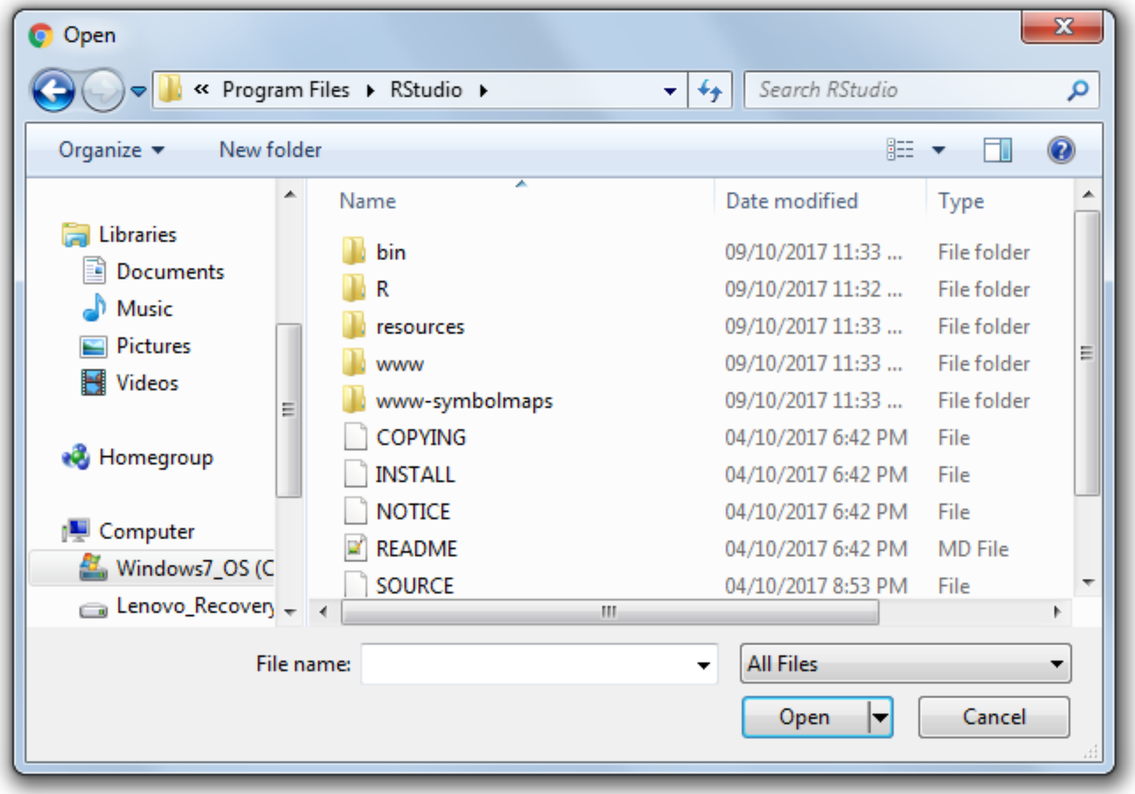
File inputs - UI

- File inputs for uploading a (text) file to Shiny app

```
fileInput(inputId, label, ...)
```



File inputs - UI



`?fileInput()` for more options

File inputs - server

- After selecting a file, it gets uploaded and available to Shiny
- Text inputs: `input$<inputId>` is text
- Numeric inputs: `input$<inputId>` is number
- File inputs: `input$<inputId>` is NOT a file

File inputs - server

- File inputs: `input$<inputId>` is dataframe with 1 row per file
- Variables: `name, size, type, datapath`

```
  name        size  type        datapath
1 myfile.txt  6000  text/plain  C:/path/to/temporary/file/0.txt
```

- `datapath` is most important: path of file
- Read selected file:

```
input$<inputId>$datapath
```

  - Text file:

```
readLines(input$<inputId>$datapath)
```

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Combining all the word sources

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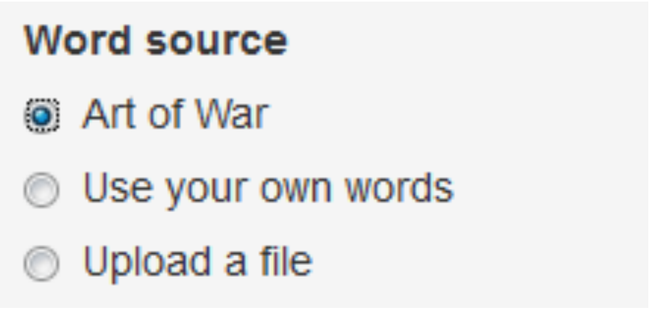
Combining all the word sources

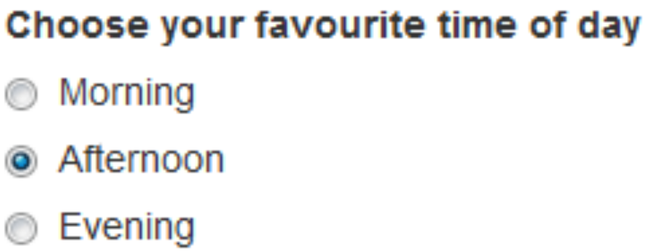
- 3 data sources for word cloud
  - Text object: `artofwar`
  - User text: `textAreaInput()`
  - Text file: `fileInput()`

- Next step: allow all together
  - Radio buttons to select word source



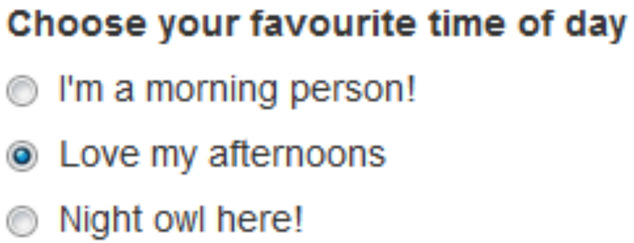
Radio buttons - review

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



Radio buttons - advanced

```
radioButtons(
    "time_of_day", "Choose your favourite time of day",
    choices = c("I'm a morning person!" = "Morning",
                "Love my afternoons"    = "Afternoon",
                "Night owl here!"       = "Evening"),
    selected = "Afternoon"
)
```




```
> str(input$time_of_day)
 chr "Afternoon"
```

Conditional panels

- Show/hide UI elements based on input value

```
conditionalPanel(condition, ...)
```

  - `condition` is similar to R code, but `input$<id>` is replaced by `input.<id>`
  - `...` is any UI

Conditional panels

```
ui <- fluidPage(
  radioButtons("time_of_day",
               "Choose your favourite time of day",
               ...),

  plotOutput("morning_only_plot")
)
```

```
ui <- fluidPage(
  radioButtons("time_of_day",
               "Choose your favourite time of day",
               ...),

  conditionalPanel(
    condition = "input.time_of_day == 'Morning'",
    plotOutput("morning_only_plot")
  )
)
```

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Fine tune the reactivity

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Reactivity review

- `reactive()` and `input$` are reactive
- Code depending on reactive variables re-runs when dependencies update
- Accessing reactive value makes it dependency

```
x <- reactive({
    y() * input$num1 * input$num2
})
```

Isolate

- Use `isolate()` to not create reactive dependency
- If reactive value inside `isolate()` is modified, nothing happens

```
x <- reactive({
    y() * isolate({ input$num1 }) * input$num2
})
```

```
x <- reactive({
    y() * isolate({ input$num1 * input$num2 })
})
```

Isolate everything

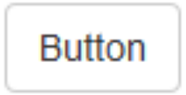
- Sometimes you want to isolate all reactives

```
x <- reactive({
    isolate({
        y() * input$num1 * input$num2
    })
})
```

- Need a way to trigger x to re-run on demand

Action buttons

```
actionButton(inputId, label, ...)
```



- Only one simple interaction: click
- Value of button is number of times it was clicked

```
# After clicking on a button twice
> str(input$button)
  int 2
```

Action buttons as reactivity triggers

- Accessing button input value in server triggers reactivity
- Add button to UI

```
actionButton(inputId = "calculate_x", label = "Calculate x!")
```

- Access button to make it dependency

```
x <- reactive({
    input$calculate_x

    isolate({
        y() * input$num1 * input$num2
    })
})
```

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Wrap-up: Go and make your own apps!

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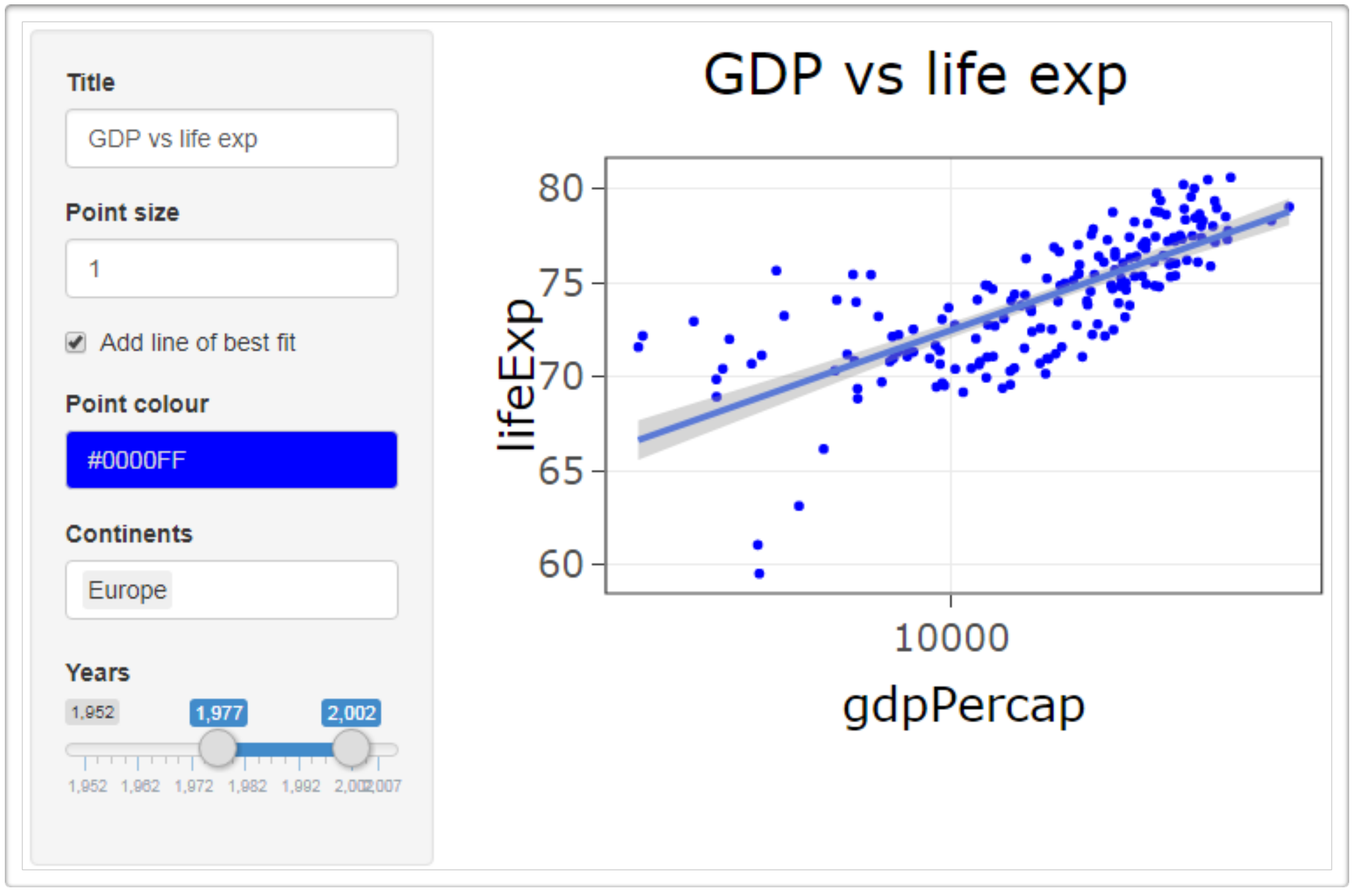
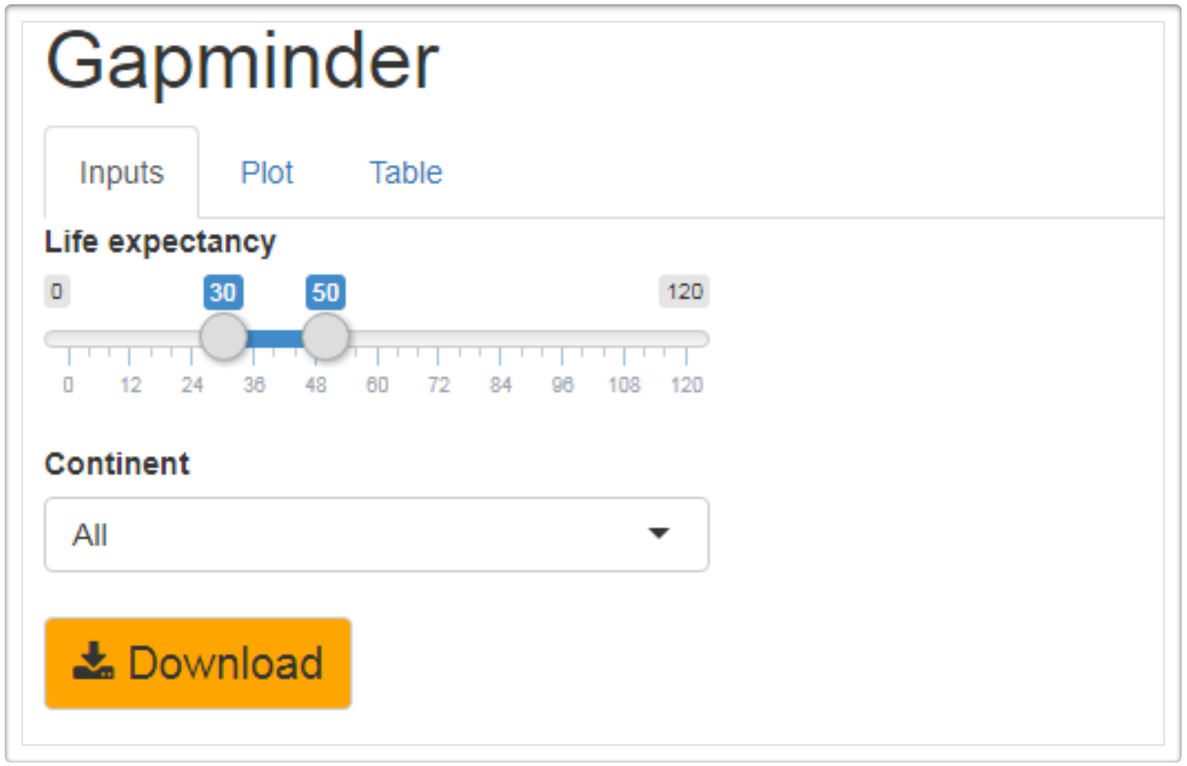
CONGRATS!

Chapter 2: Plotting app



Shiny is great for customizing plots with many parameters

Chapter 3: Data exploration app



Shiny is great as a data exploration tool.

Think about ease of use and user experience, not only functionality.

Chapter 4: Cloud word app

Shiny is great for exposing R code as graphical interface, or for sharing your R code with non R users.

Your turn!