

Oct 2024

R Shiny Masterclass Series - Introduction

Case study, top 10 tips for data visualisation with R Shiny and wrap-up



EPI-interactive

Agenda

- **Session 1** | 30 September | Getting started with Posit Cloud and your first R Shiny app
- **Session 2** | 01 October | R Shiny core concepts and mobile ready layout
- **Session 3** | 03 October | R Shiny user interface components, reactivity and debugging
- **Session 4** | 07 October | Data sources and data processing in R Shiny
- **Session 5** | 08 October | Maps and spatial visualisation with Leaflet: adding map layers, annotations, pins, filters and legend
- **Session 6** | 10 October | Interactive charts with Plotly: chart types, customising hover boxes and chart styling
- **Session 7** | 14 October | Publishing R Shiny apps, design considerations and case study
- **Session 8** | 15 October | Case study, top 10 tips for data visualisation with R Shiny and wrap-up

Today

Recap: Session 7 challenge

What we'll cover:

- Case study
- Top 10 tips
- Wrapping up

Top 10 Tips

1 – Limit input values

OK:

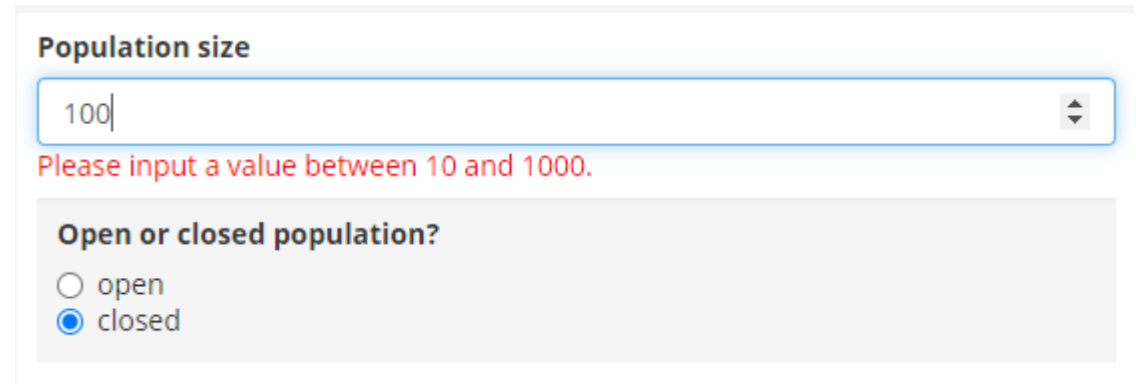
Checkbox, date input, radio buttons, select box, sliders

Think twice:

Numeric input, file input

Tip:

- Define min and max values, default value and increment!
- File upload – check format and values



Population size

100

Please input a value between 10 and 1000.

Open or closed population?

☐ open

☒ closed

2 – Manage no data

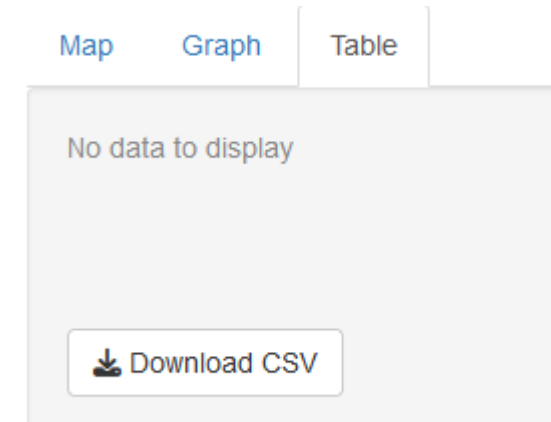
Symptom:

- Shiny errors at start before graphs are displayed
- Graphs don't show at all

Tips:

- Use `req` to stop a calculation “behind the scenes”
<https://shiny.rstudio.com/articles/req.html>
- Use `validate` and `need` to check values and output message
<https://shiny.rstudio.com/reference/shiny/latest/validate.html>

```
output$world_data_chart <- renderPlotly({  
  # req(!is.null(filtered_data()))  
  validate(need(!is.null(filtered_data()), "No data to display"))  
  
  plot_ly(  
    data = filtered_data(),  
    x = ~subregion,  
    y = ~total_pop  
  )  
})
```



3 – Show progress

Symptom:

- App freezes
- User is not sure what's going on



Tips:

- Add a progress bar / counter (use `withProgress`, `incProcess`)

Check: <http://shiny.rstudio.com/gallery/progress-bar-example.html>

4 – Delay reactions

When to restrict reactivity?

- Long calculations
- Multiple parameters
- UX

Tips:

- Use Action Button with `eventReactive()`
- Code is isolated until button is changed

Check: <https://shiny.rstudio.com/articles/action-buttons.html> (see Pattern 2 on page)

The screenshot shows a Shiny app interface with a dark teal background. At the top, there is a 'County' label with a location pin icon and an information icon. Below it is a dropdown menu showing 'Aitkin'. A teal button labeled 'Customize included lakes' is positioned below the dropdown. Further down, there is a 'Risk species' section with a warning triangle icon and an information icon. This section contains four checkboxes: 'Zebra mussel' (checked), 'Starry stonewort' (checked), 'Eurasian watermilfoil' (unchecked), and 'Spiny waterflea' (unchecked). At the bottom of the interface, a teal button labeled 'Run' is highlighted with a red rectangular border.

5 – Group controls

Too many parameters?

- UX problem...

Tips:

- Visually group parameters, e.g. wellPanel
- Combine reactive and non-reactive elements

Check: <https://shiny.rstudio.com/gallery/bus-dashboard.html>

Select infection states to consider ⓘ

Current selection
S, Is, R

All infected units recover from infection
Removed units are not replaced (closed population selected)
A unit which recovered from infection remains immune until removed

▲ Hide settings

Infection states

☐ E ☐ Ia ☒ Is ☒ R

How many units recover from infection?

☒ All units recover
☐ Some units recover (set 'Probability of being removed after infection' in 'Define infection and transmission features')

Does a unit which recovered from infection remain immune until removed?

☒ Yes
☐ No (set 'Length of immune period' in 'Define infection and transmission features')

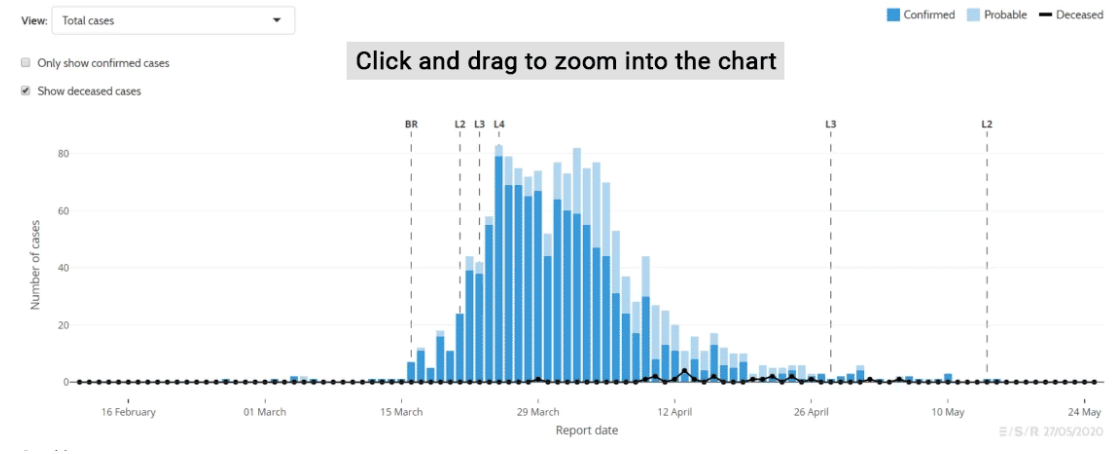
6 – Provide context

Guide the user what they see and can do...

- Add page lead-in descriptions
- Use info buttons for in-depth descriptions
- Add tabs with descriptions

Other:

- User guides
- Video tutorials with case studies



7 – Documentation

Would someone else be able to read your code?

- You're not always the only one working on code, others need to know what's happening
- Use comments to clarify complex blocks of code
- Separate your app into separate files (modules)
- Use line comments to split up sections in the same file (*Ctrl + Shift + r*)
- Use meaningful variable / function names
- Keep related functions and blocks of code close to each other
- Check that your code is properly indented (*Ctrl + i*)

8 – Interactive or image-based outputs?

Interactive:

- Plotly www.plot.ly/r/
- Leaflet <https://rstudio.github.io/leaflet/>
- Custom

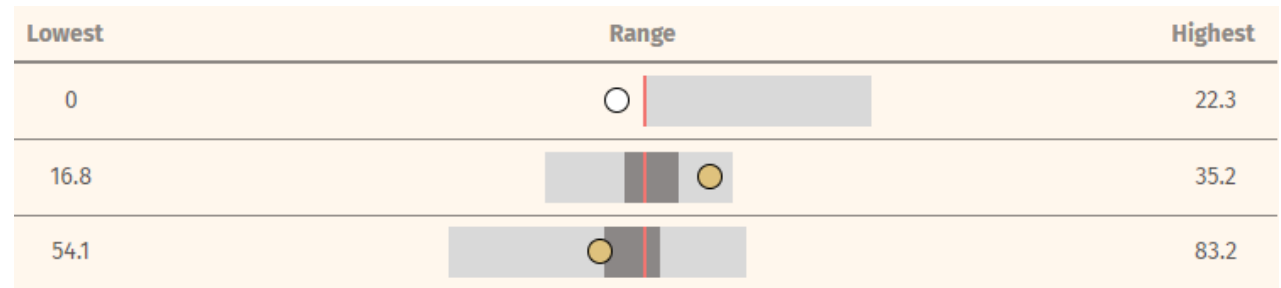


Image-based:

- Pretty much anything goes... (use `renderPlot`, `plotOutput`)
- Check sizing

9 – Testing and feedback process

Testing and refinement:

- Can take up to 50% of development effort (or more)
- Internal vs. external testing
- Typically 3 draft versions

Providing feedback:

- Controlled way to provide feedback
- Feedback sheet
- Issue tracker system (e.g. GitLab, GitHub)

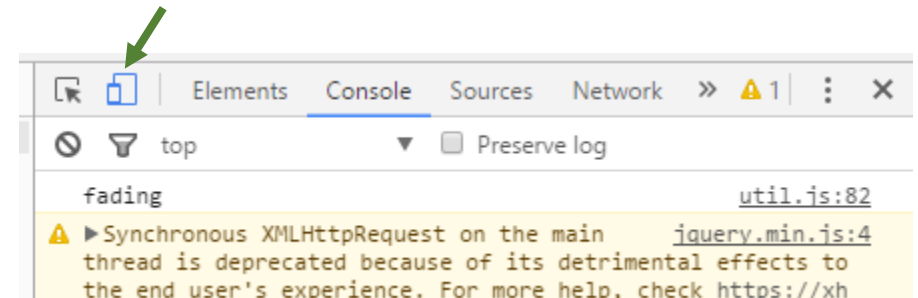
10 – Mobile readiness

To consider at the start of the project:

- Target devices
- Min/max screen resolutions

Test:

- In Chrome – use Developer Tools [Ctrl+Shift+I] go to “Device Toolbar”
- Or: [MobileTest.me](https://mobiletest.me)
- Test on devices where possible!





R Shiny open source repositories

We develop innovative data-driven dashboards for better decision making, data sharing and teaching – open-source technology is at the heart of what we do, here are some coding samples we'd like to give back to the community.

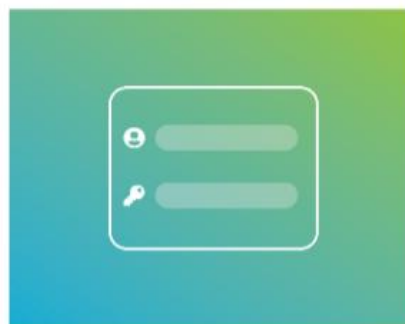
Looking for more? Contact us at info@epi-interactive.com

 Studio Full Service Certified Partner

Progress Indicator



User Authentication



Datatable Overlay



Custom Theming



Dynamic PDF Generator



Choropleth Grid



Wrapping up

Open question session

- Anything to clarify from our sessions?
- How comfortable are you using R and R Shiny now?
- What concepts have been most useful?

Wrapping up:

- Certificates, Posit Cloud, learning platform, recordings
- Where to from here?

Thank you for joining the Masterclass!

Connect with us on [LinkedIn](#)