Oct 2024

R Shiny Masterclass Series - Introduction

Host and deploy your Shiny application with Shinyapps.io

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

Designing your Shiny app
Publishing your Shiny app
Extended Exercise & practice

Designing your Shiny app

Design principles

- Colour scheme
- Accessibility
- Font
- Icons
- White space

Colour scheme

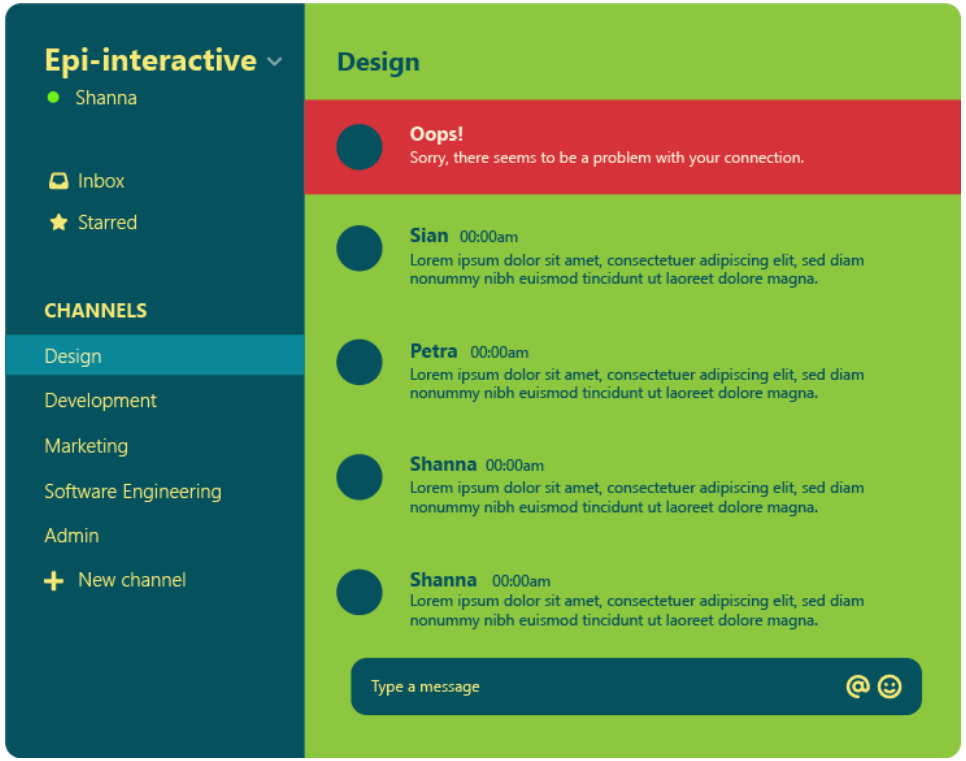
A consistent colour scheme brings a theme together

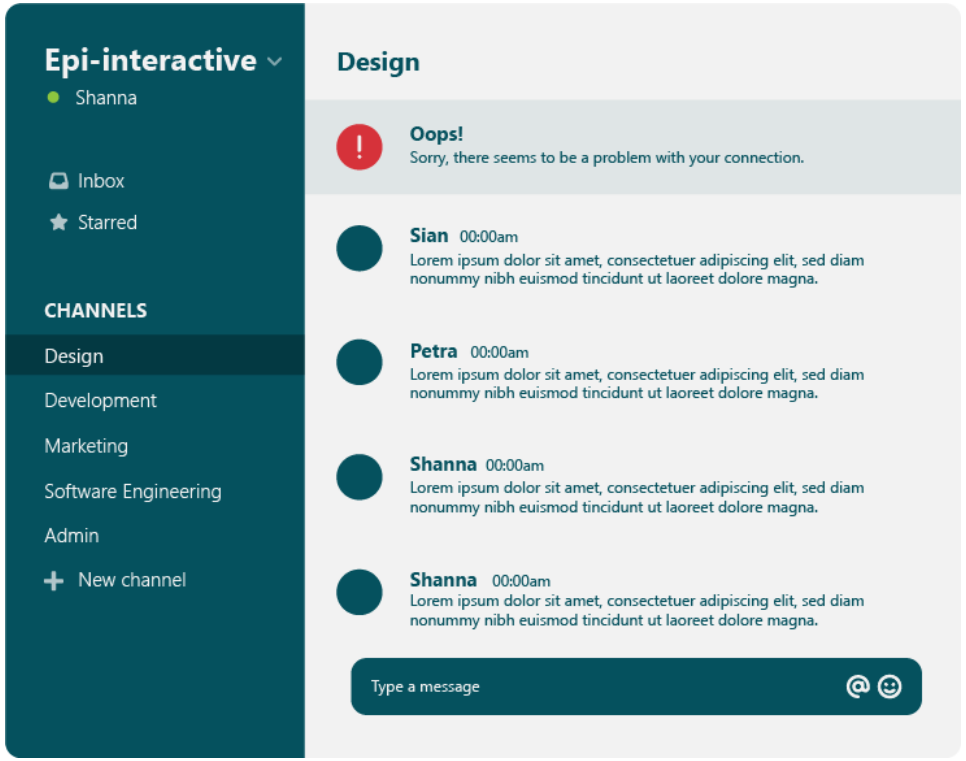
Limit your colour palette

Think about what colours you use where:

- Neutral - background colour, text elements
- Primary - foreground colours, navigation elements
- Bright - colours for points of interest

Colour scheme





Kupe | DATA EXPLORER

About Feedback Help Method | hpa.org.nz

Choose a topic: Alcohol

Choose a subtopic: Alcohol attitudes

Choose an indicator: Reduce the hours alcohol can be sold

Alcohol › Alcohol attitudes › Reduce the hours alcohol can be sold in my community

Alcohol

Download Charts (zip)

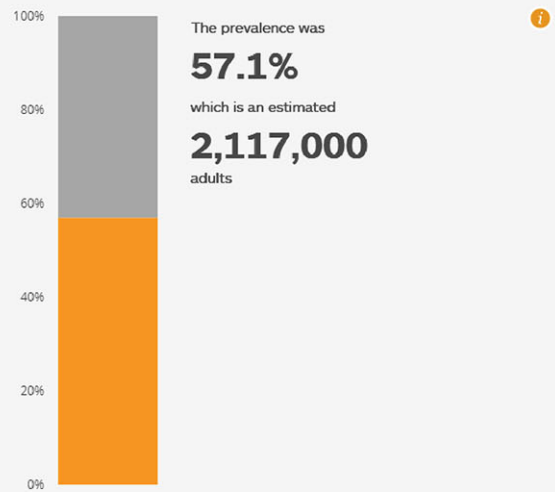
Indicator: Reduce the hours alcohol can be sold in my community

New Zealand adults who support reduction in the hours when alcohol can be sold in the community where they live.

More information

Overview | Prevalence / mean | Subgroups comparison | Changes over time

2016 Health and Lifestyles Survey



The prevalence was

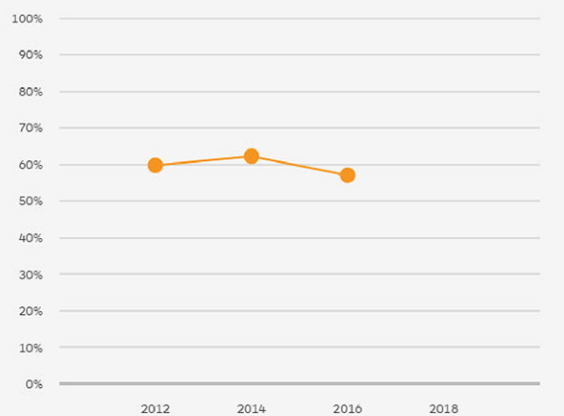
57.1%

which is an estimated

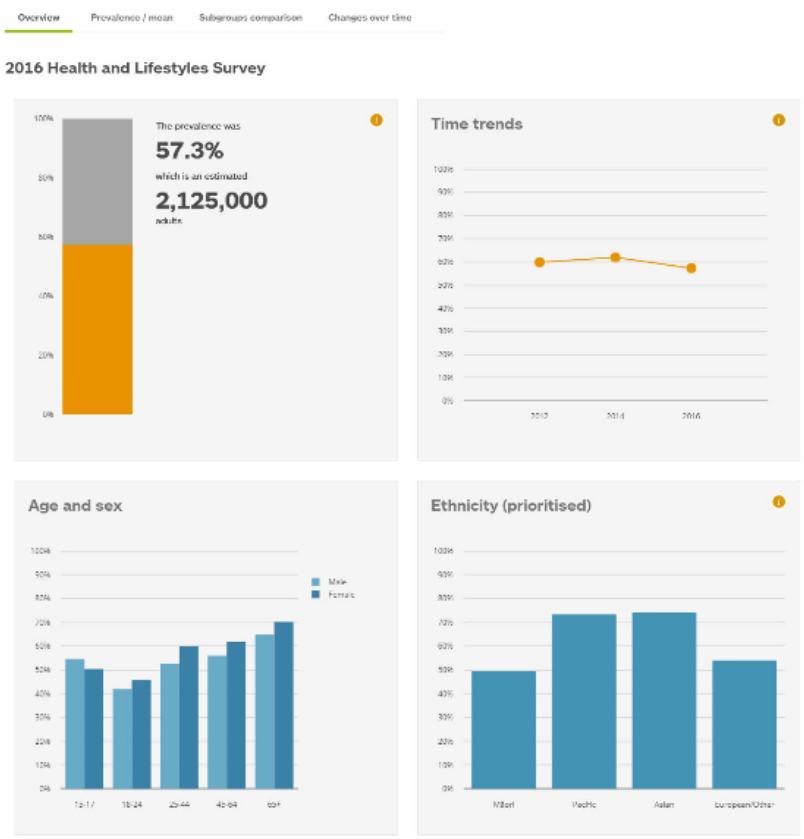
2,117,000

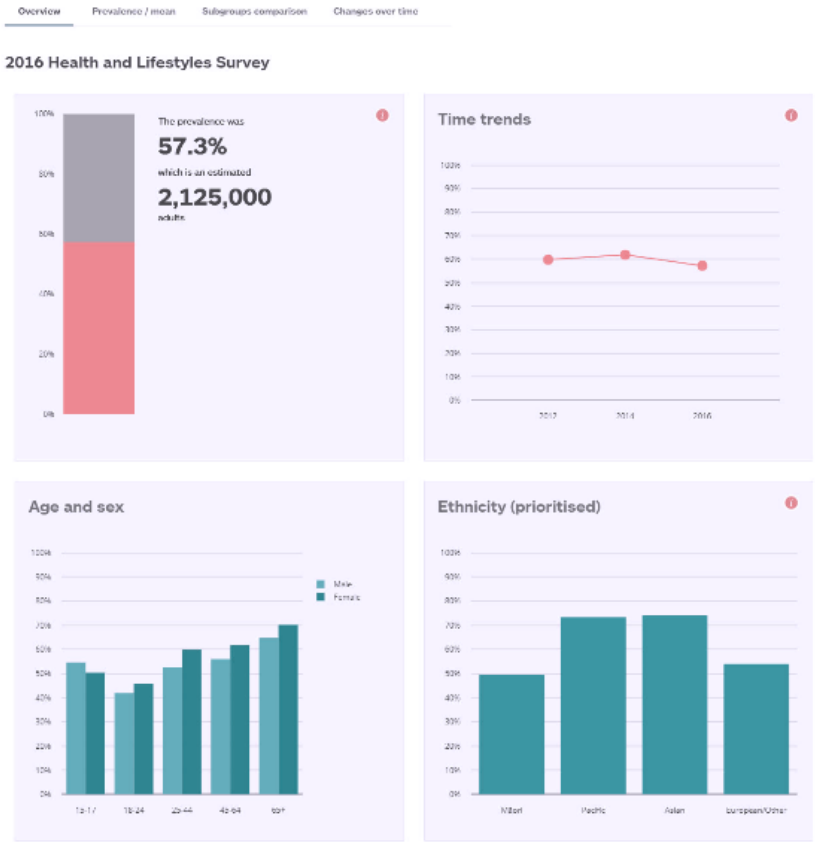
adults

Time trends



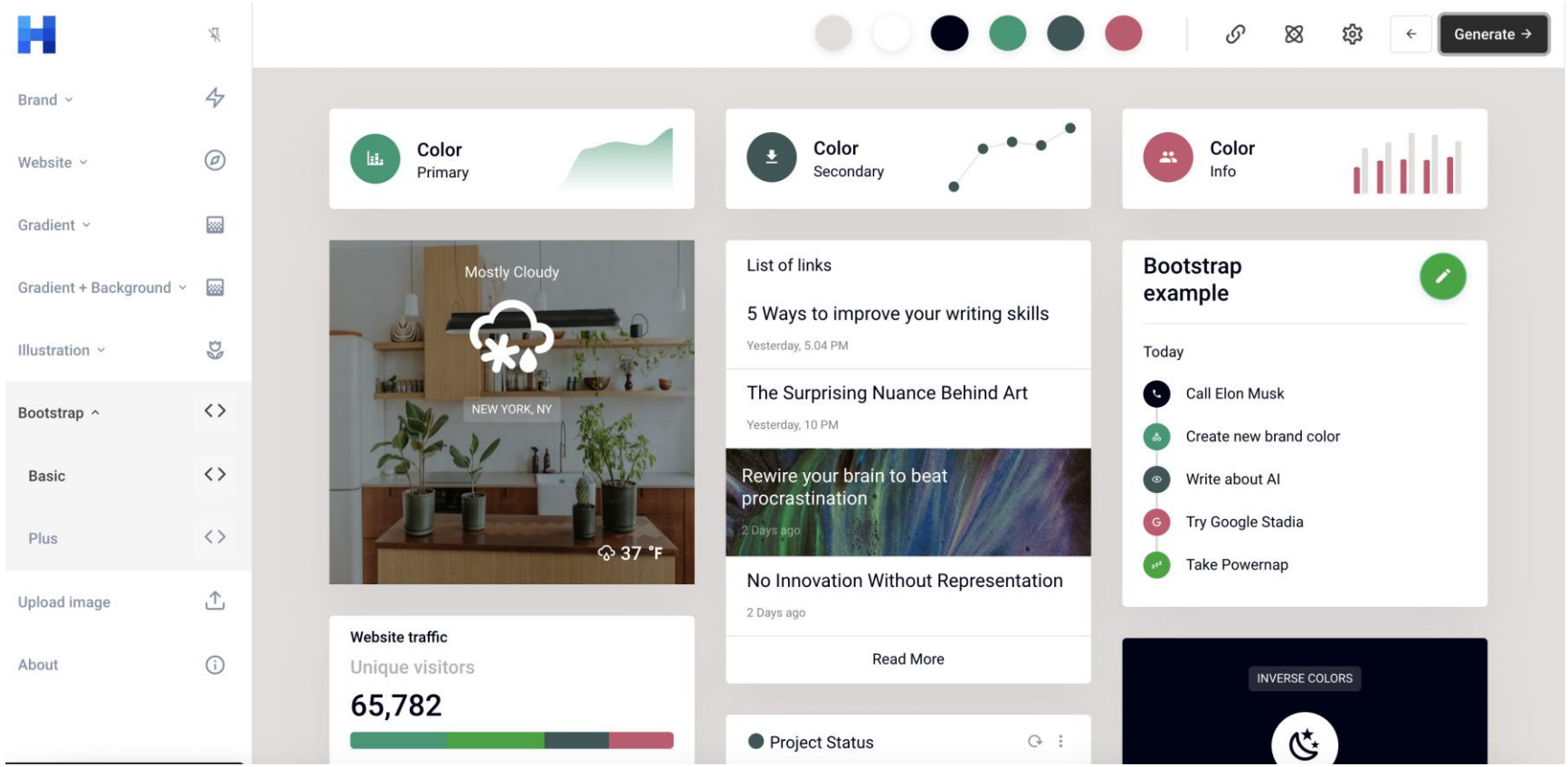
Accessibility





http://www.color-blindness.com/coblis-color-blindness-simulator/

Colour selection – Hue Mint



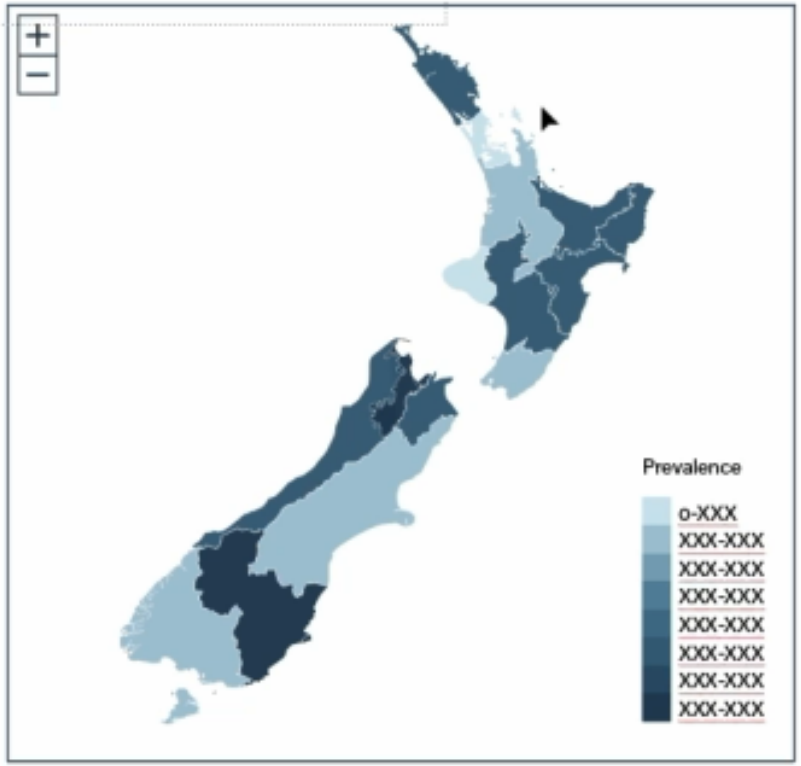
https://huemint.com/

DATA EXPLORER

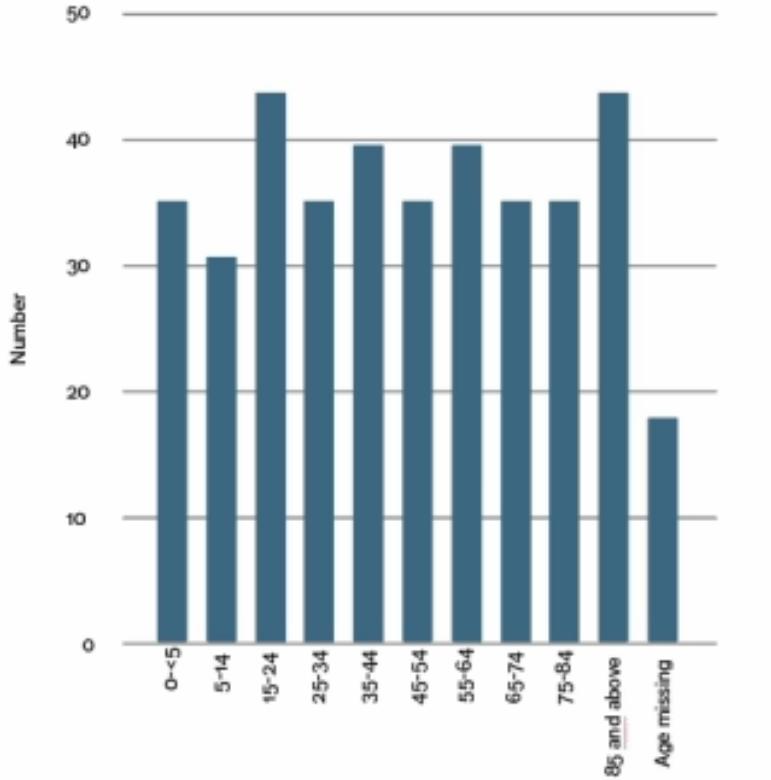
CATEGORY: All

TIME PERIOD: Last 12 months

Map



Age Groups

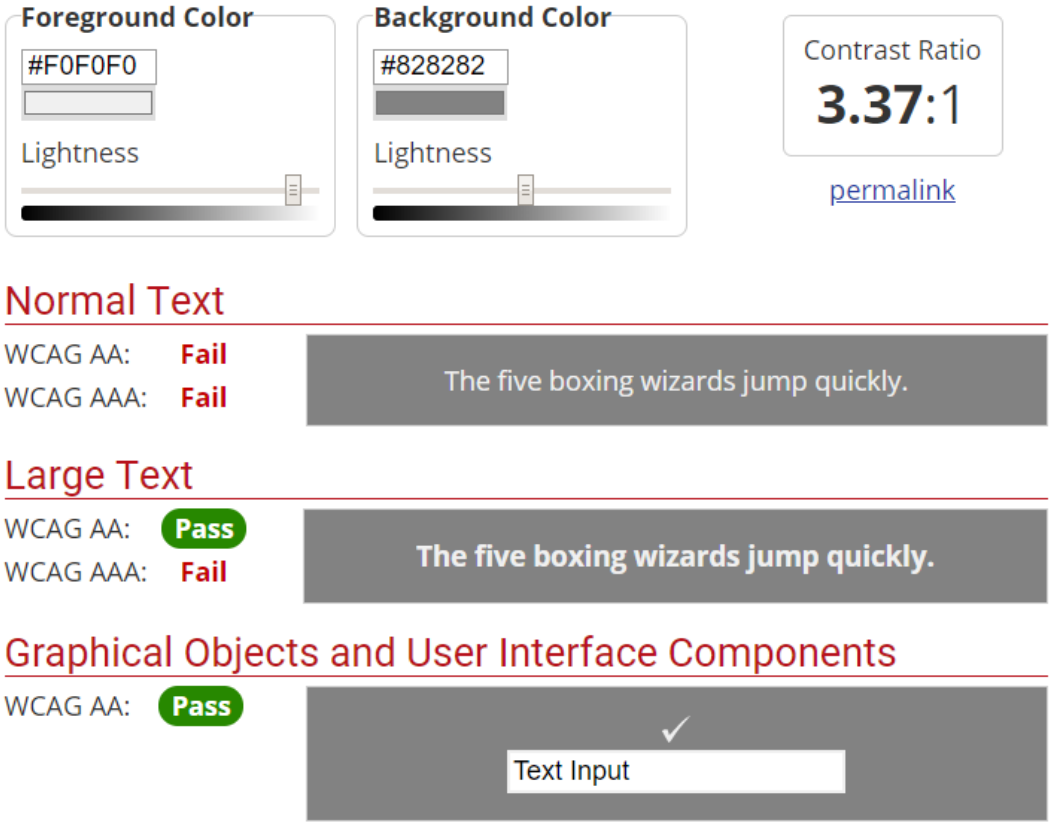


Adobe generative recolour

Accessibility

Bad contrast

Good contrast



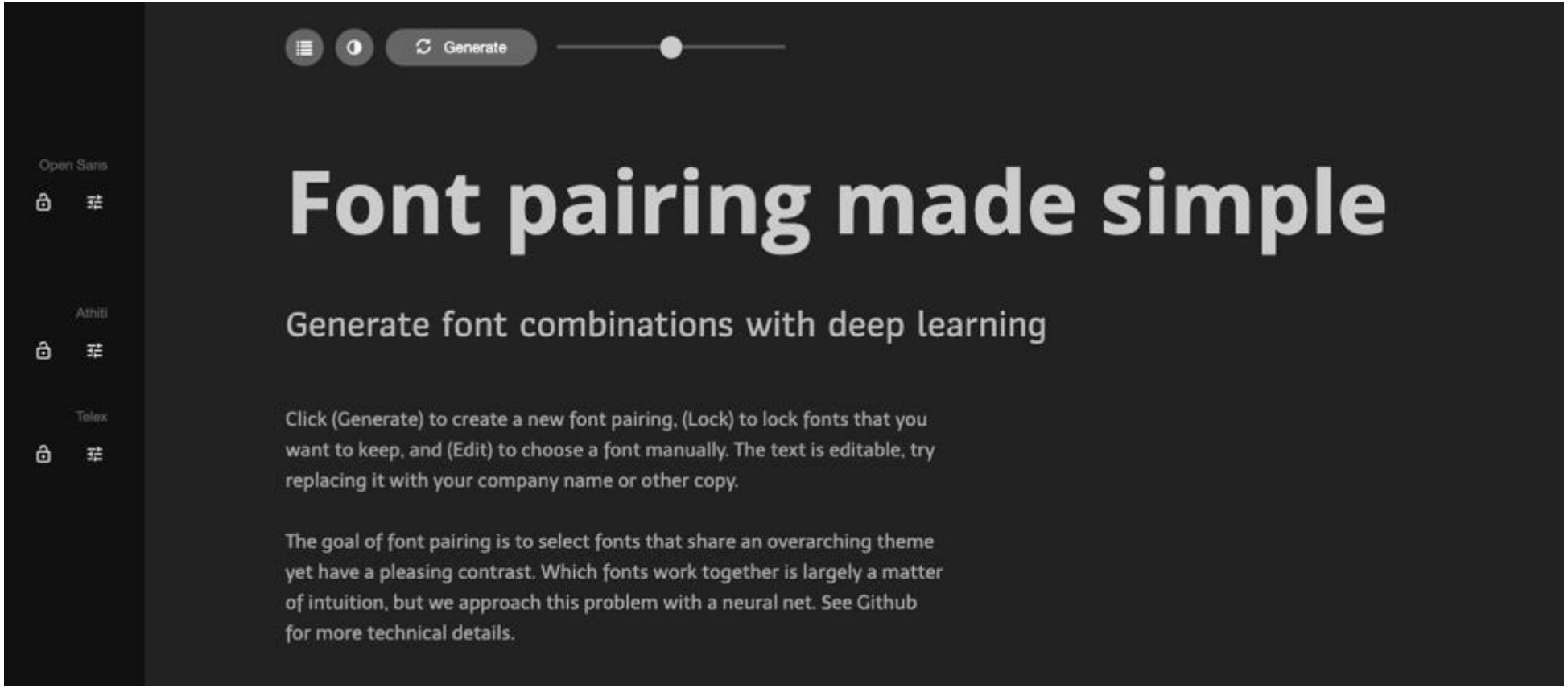
https://webaim.org/resources/contrastchecker/

Choosing your font

- ~~Comic sans~~
- ~~Serif fonts~~

Serif Sans serif

Fontjoy



https://fontjoy.com/

Use font consistently

Make sure you only have a handful of font styles

Heading

Sub-heading

Body text

Links

Alcohol attitudes

Support for changes to help reduce problems associated with alcohol use.

Prevalence for selected subtopic

This table gives the percentage of the population affected (that is, the unadjusted prevalence in the specified population). Click on an indicator to find out more about it.

Show:

Total

Indicator	Year (%)				
	2010	2012	2014	2016	2018
Reduce the hours alcohol can be sold in my community	65.9	58.8	60.8	56.1	-
Increase restrictions on advertising/promotion seen or heard by under 18s	82.0	78.9	77.9	78.6	-
Ban alcohol-related sponsorship of events that people under 18 may attend	58.4	73.9	63.3	67.2	-
Too many local places to buy alcohol	-	39.4	34.8	31.3	-

Source: Health and Lifestyles Survey

Notes:

- Dashes indicate the data is not available.
  - For Total response this is due to the question/s not being asked in that survey wave.
  - For specific ethnicity totals, it may be due to the question not being asked or due to small sample size.

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Icons

Home

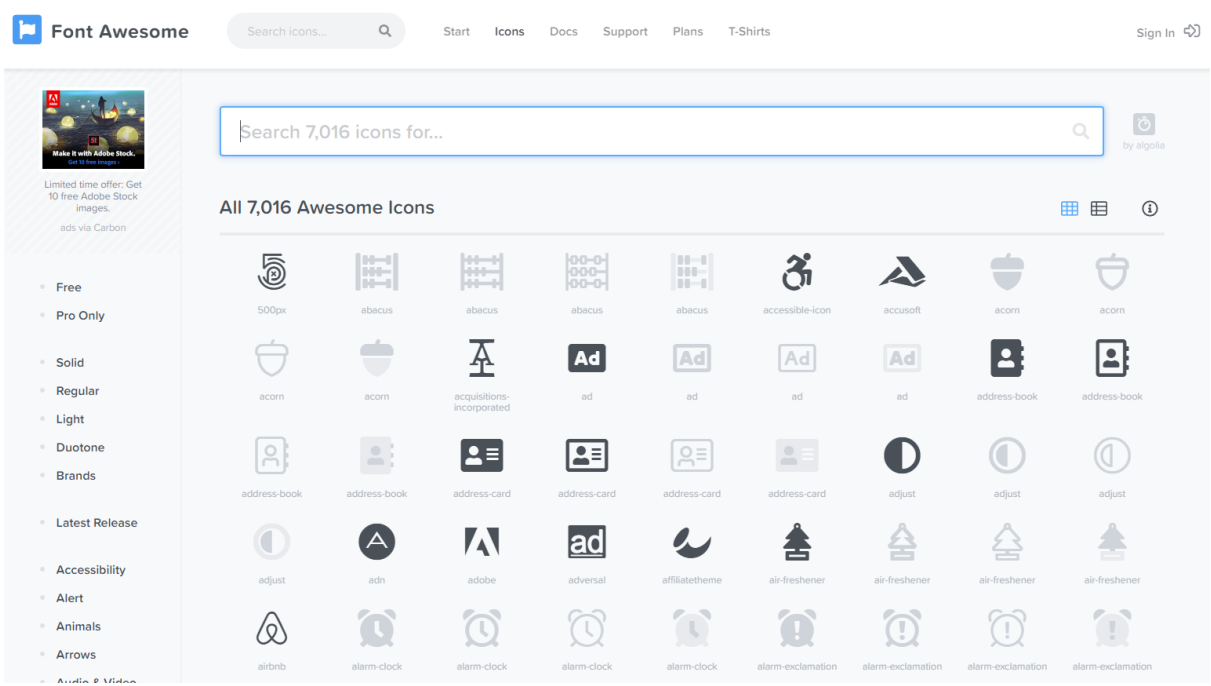
Download

Search

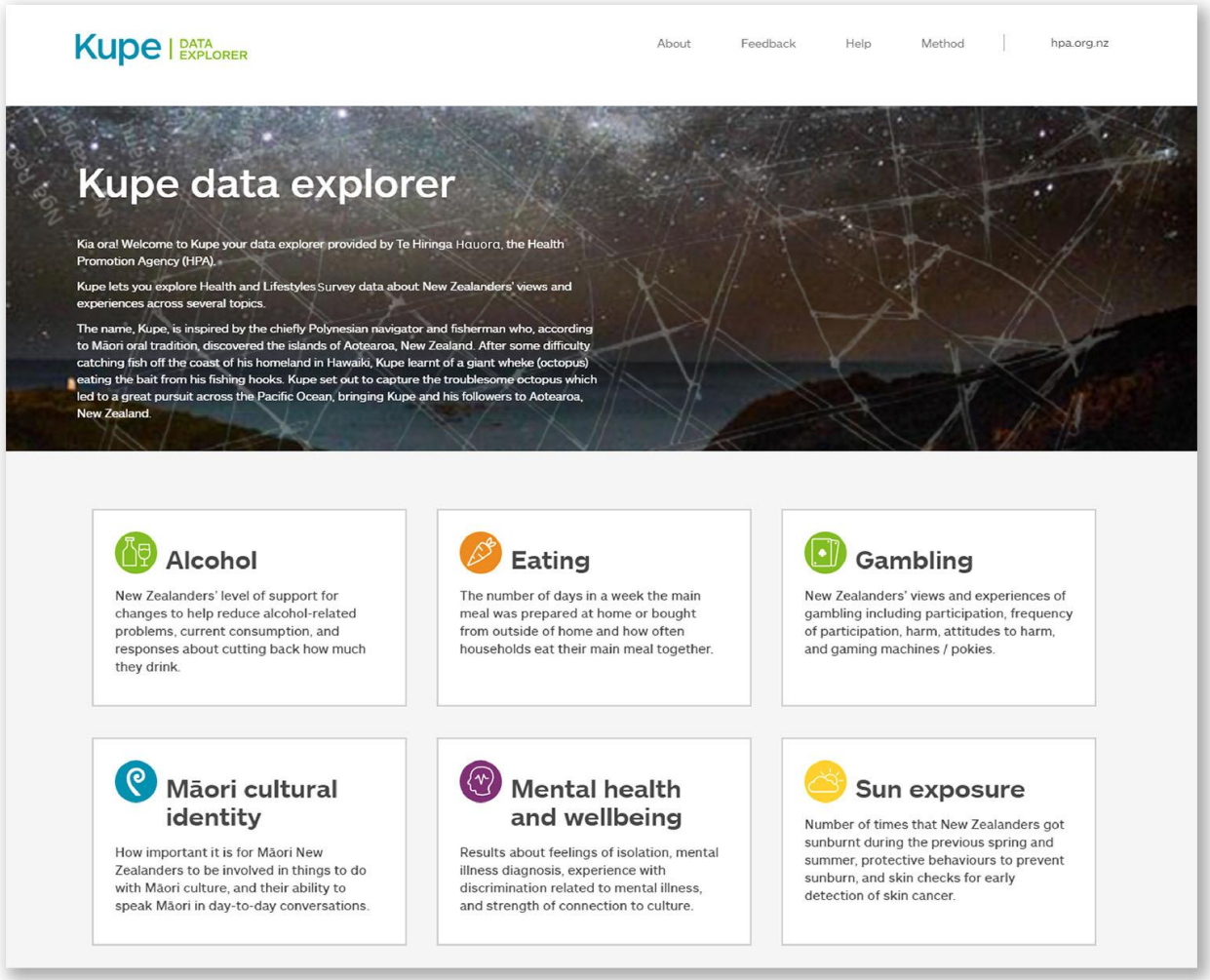
Save

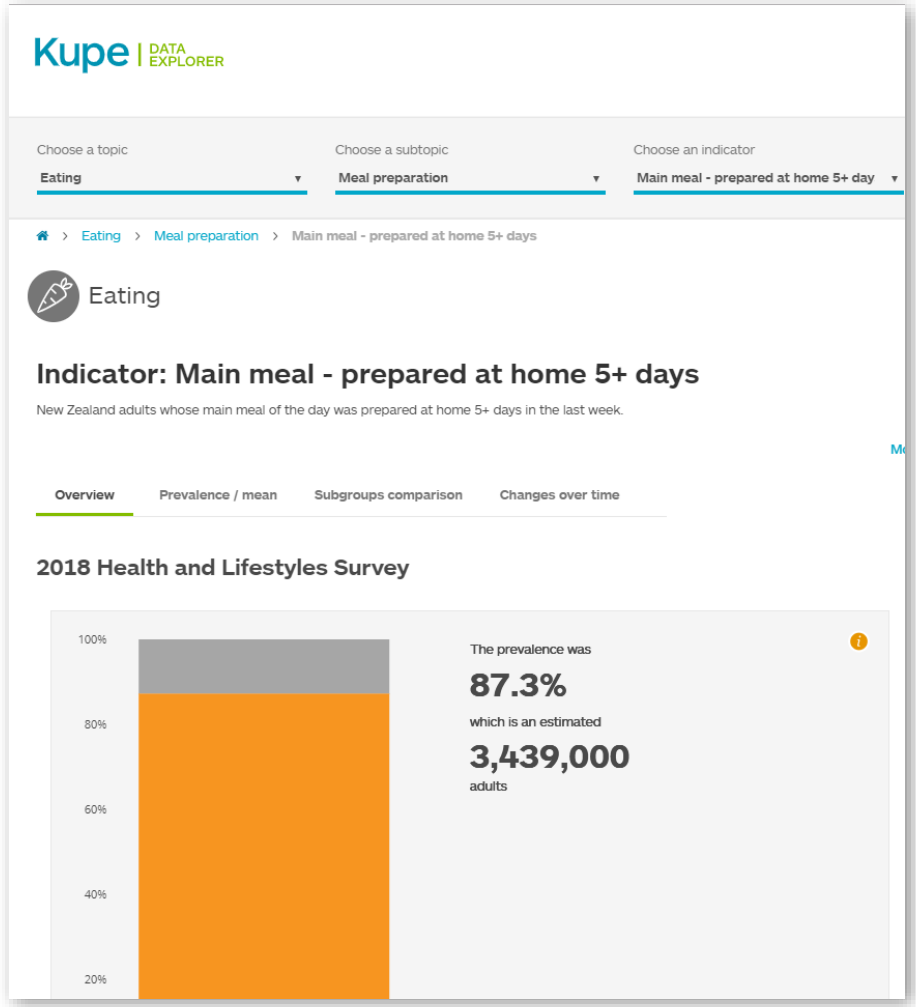
Volume

Settings

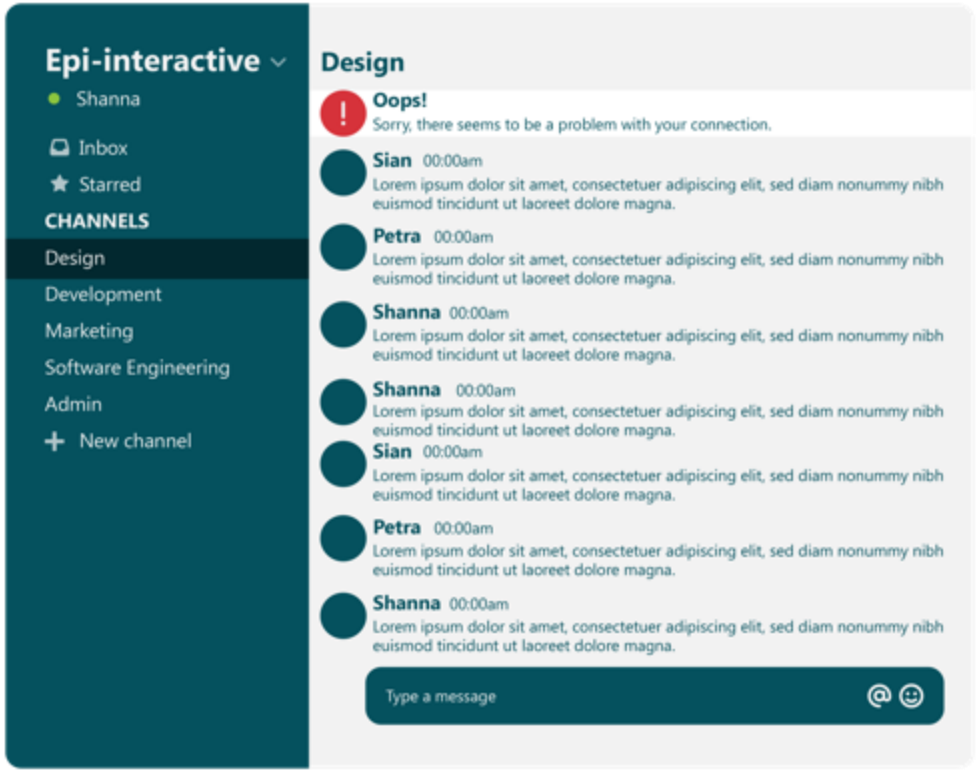


https://fontawesome.com/icons?d=gallery


Kupe | DATA EXPLORER
About
Feedback
Help
Method
hpa.org.nz
Kupe data explorer
Kia ora! Welcome to Kupe your data explorer provided by Te Hiringa Hauora, the Health Promotion Agency (HPA).
Kupe lets you explore Health and Lifestyles Survey data about New Zealanders' views and experiences across several topics.
The name, Kupe, is inspired by the chiefly Polynesian navigator and fisherman who, according to Māori oral tradition, discovered the islands of Aotearoa, New Zealand. After some difficulty catching fish off the coast of his homeland in Hawaiki, Kupe learnt of a giant wheke (octopus) eating the bait from his fishing hooks. Kupe set out to capture the troublesome octopus which led to a great pursuit across the Pacific Ocean, bringing Kupe and his followers to Aotearoa, New Zealand.
Alcohol
New Zealanders' level of support for changes to help reduce alcohol-related problems, current consumption, and responses about cutting back how much they drink.
Eating
The number of days in a week the main meal was prepared at home or bought from outside of home and how often households eat their main meal together.
Gambling
New Zealanders' views and experiences of gambling including participation, frequency of participation, harm, attitudes to harm, and gaming machines / pokies.
Māori cultural identity
How important it is for Māori New Zealanders to be involved in things to do with Māori culture, and their ability to speak Māori in day-to-day conversations.
Mental health and wellbeing
Results about feelings of isolation, mental illness diagnosis, experience with discrimination related to mental illness, and strength of connection to culture.
Sun exposure
Number of times that New Zealanders got sunburnt during the previous spring and summer, protective behaviours to prevent sunburn, and skin checks for early detection of skin cancer.


Kupe | DATA EXPLORER
Choose a topic
Eating
Choose a subtopic
Meal preparation
Choose an indicator
Main meal - prepared at home 5+ day
Eating > Meal preparation > Main meal - prepared at home 5+ days
Eating
Indicator: Main meal - prepared at home 5+ days
New Zealand adults whose main meal of the day was prepared at home 5+ days in the last week.
Overview
Prevalence / mean
Subgroups comparison
Changes over time
2018 Health and Lifestyles Survey
100%
80%
60%
40%
20%
The prevalence was
87.3%
which is an estimated
3,439,000
adults

White space


Epi-interactive
Shanna
Inbox
Starred
CHANNELS
Design
Development
Marketing
Software Engineering
Admin
New channel
Design
Oops!
Sorry, there seems to be a problem with your connection.
Sian 00:00am
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna.
Petra 00:00am
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna.
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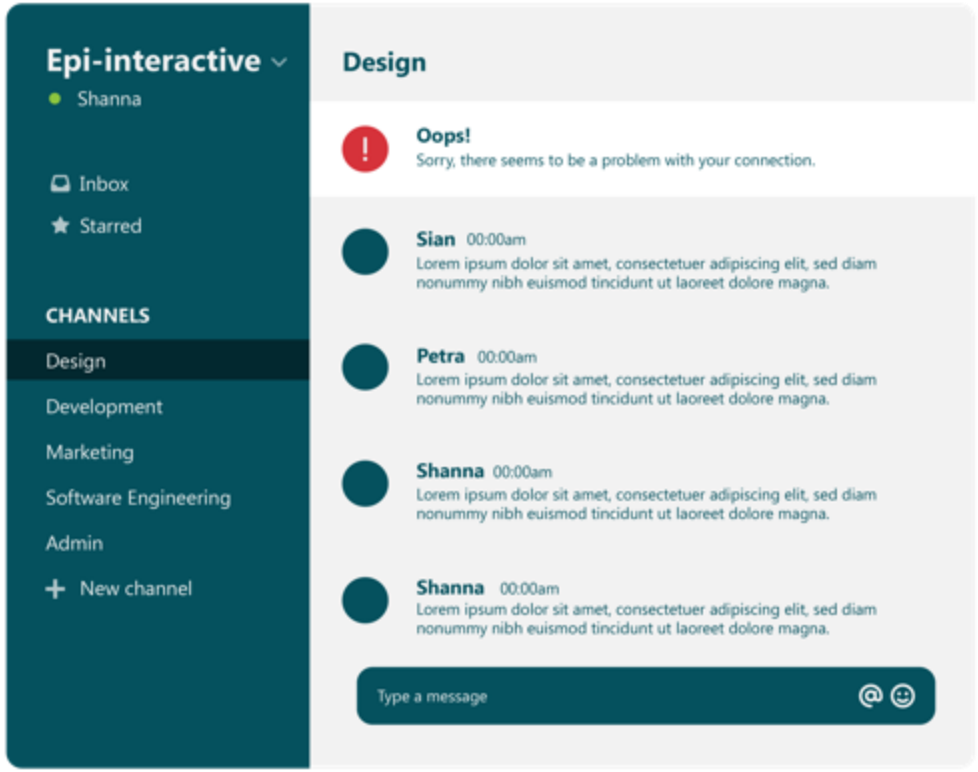
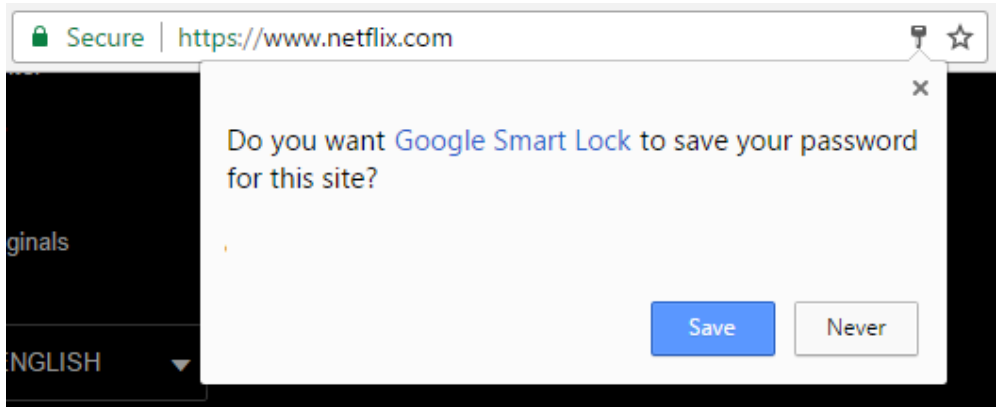
Type a message


Epi-interactive
Shanna
Inbox
Starred
CHANNELS
Design
Development
Marketing
Software Engineering
Admin
New channel
Design
Oops!
Sorry, there seems to be a problem with your connection.
Sian 00:00am
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna.
Petra 00:00am
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna.
Shanna 00:00am
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna.
Shanna 00:00am
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna.
Type a message

Web design mimics real life



Wrap-up design principles

- Choose a limited, well thought out colour palette
- Always consider accessibility in the design
- Pick the right font styles for your website
- Use icons to show and not tell
- Take inspiration from real life

R Shiny Publishing

Posit Cloud vs publishing

Posit Cloud

- Development environment*
- Others need to run the application from the code
- Testing
- Audience: analysts, data scientists, developers

Publishing

- Production environment
- Code is not accessible
- Audience: stakeholders, decision makers, end users

Hosting considerations

- Number of users
- Authentication and authentication
- Self or cloud hosting
- Performance
- Scalability
- Support
- Security
- Price

Cloud Hosting: shinyapps.io

Free

- 5 applications
- 25 active hours
- Community support

Paid

- 25+ applications
- 100+ active hours
- Premium email support
- Authentication
- Performance boost
- Custom domains

FREE

$0 /month

New to Shiny? Deploy your applications for FREE.

- **5** Applications
- **25** Active Hours
- Community Support

Sign Up Now

STARTER

$13 /month

(or $145/year)

More applications. More active hours!

- **25** Applications
- **100** Active Hours
- Premium Email Support

Sign Up Now

BASIC

$49 /month

(or $550/year)

Take your users to the next level!

- **Unlimited** Applications
- **500** Active Hours
- Performance Boost
- Premium Email Support

Sign Up Now

STANDARD

$119 /month

(or $1,330/year)

Password protection? Authenticate your users!

- **Unlimited** Applications
- **2,000** Active Hours
- Authentication
- Performance Boost
- Premium Email Support

Sign Up Now

PROFESSIONAL

$349 /month

(or $3,860/year)

Professional has it all! Personalize your domains.

- **Unlimited** Applications
- **10,000** Active Hours
- Authentication
- Account Sharing
- Performance Boost
- Custom Domains
- Premium Email Support

Sign Up Now

EPI-interactive

Cloud hosting: Posit connect cloud

- Public version of Posit Connect enterprise platform
- Announced July 2024 – currently in Alpha release
- Limited to deploying code from public GitHub accounts
- Cross platform
- Actively under development

Cloud Hosting: Open Source

Shiny server (Free)

- Linux only
- Fast deployment
- No limits with active hours
- Requires installation of packages (no limits)

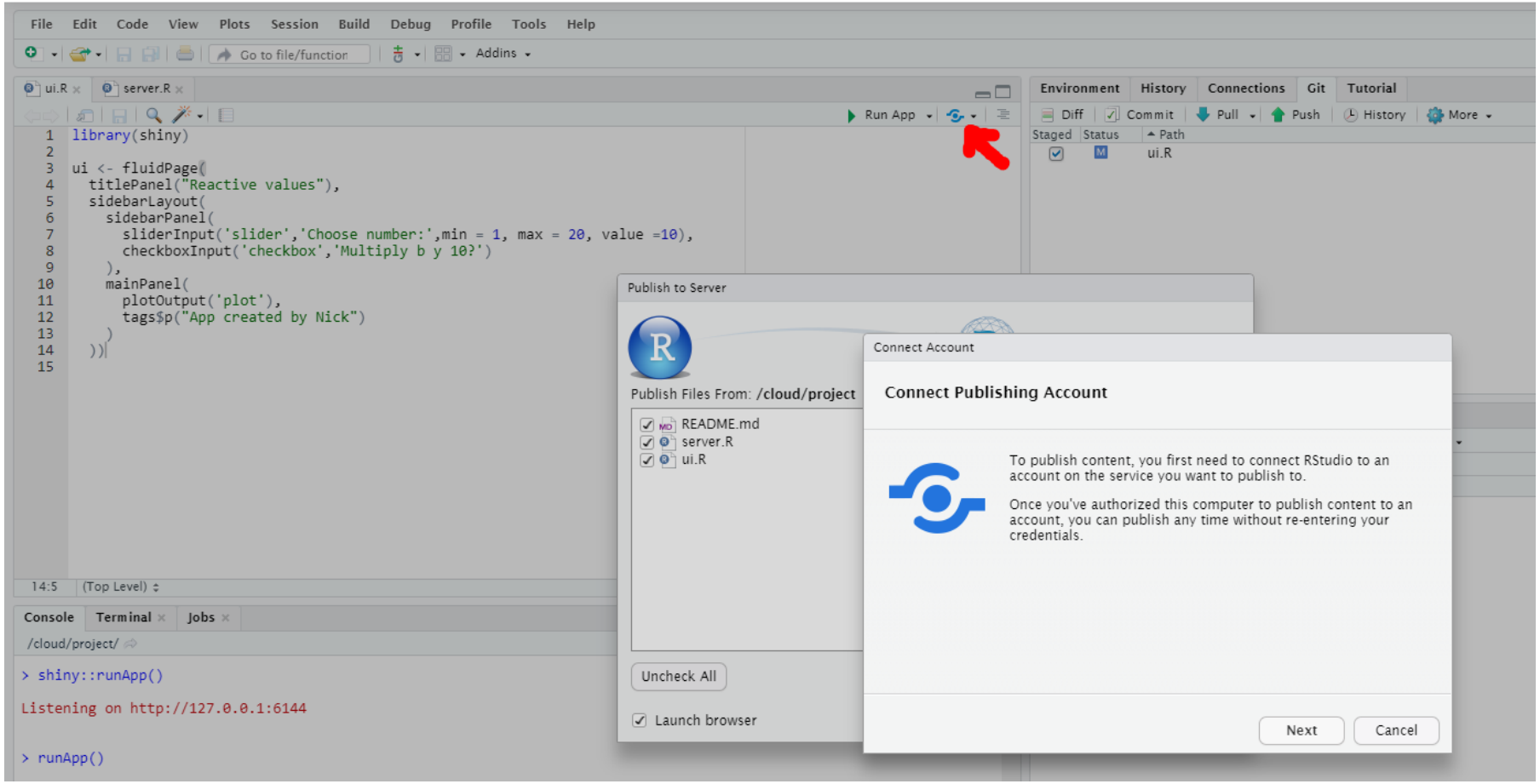
Shiny proxy

- For enterprise context (e.g. LDAP authentication)
- Based on Docker containers
- Can deploy other applications as well (e.g. Python Dash)
- Scalable – starts new app instance for each new user

Cloud Hosting: Commercial

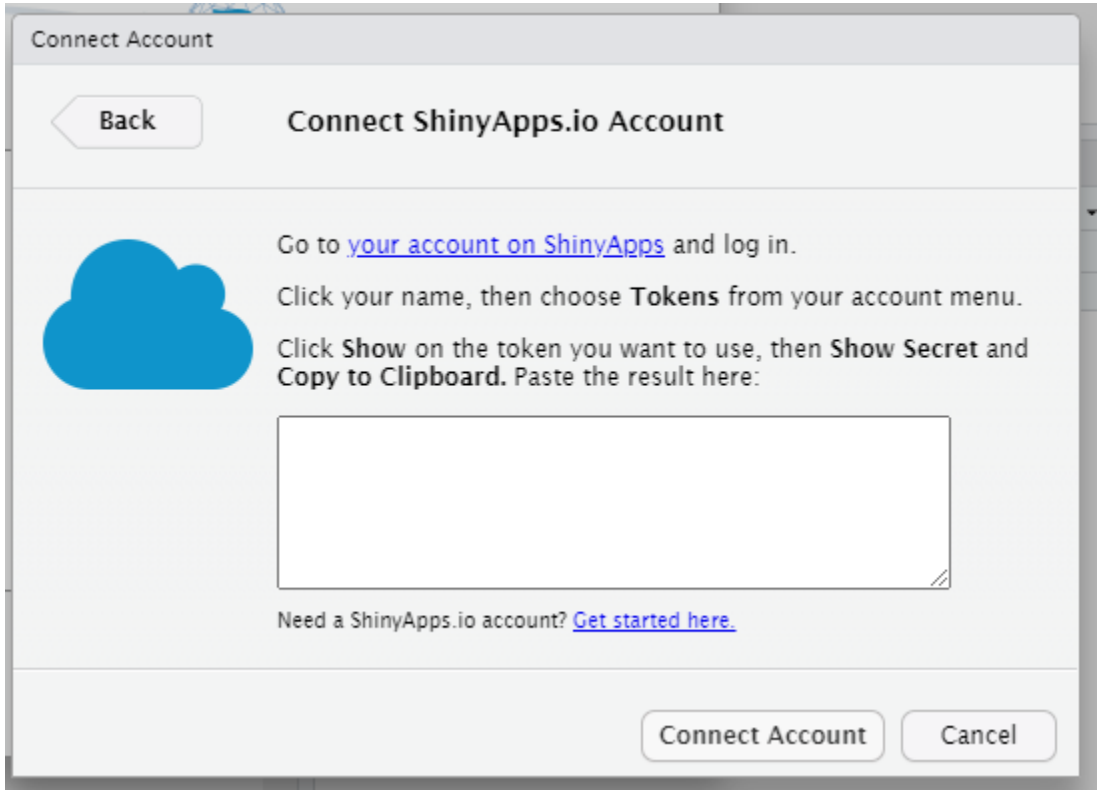
- Commercial License (not AGPL)
- Posit Support
- Push-button publishing from RStudio IDE
- Scheduled updates and distribution of reports
- Self-managed content - see and manage what you've published or can access from others
- Professional Drivers

Demo: shinyapps.io

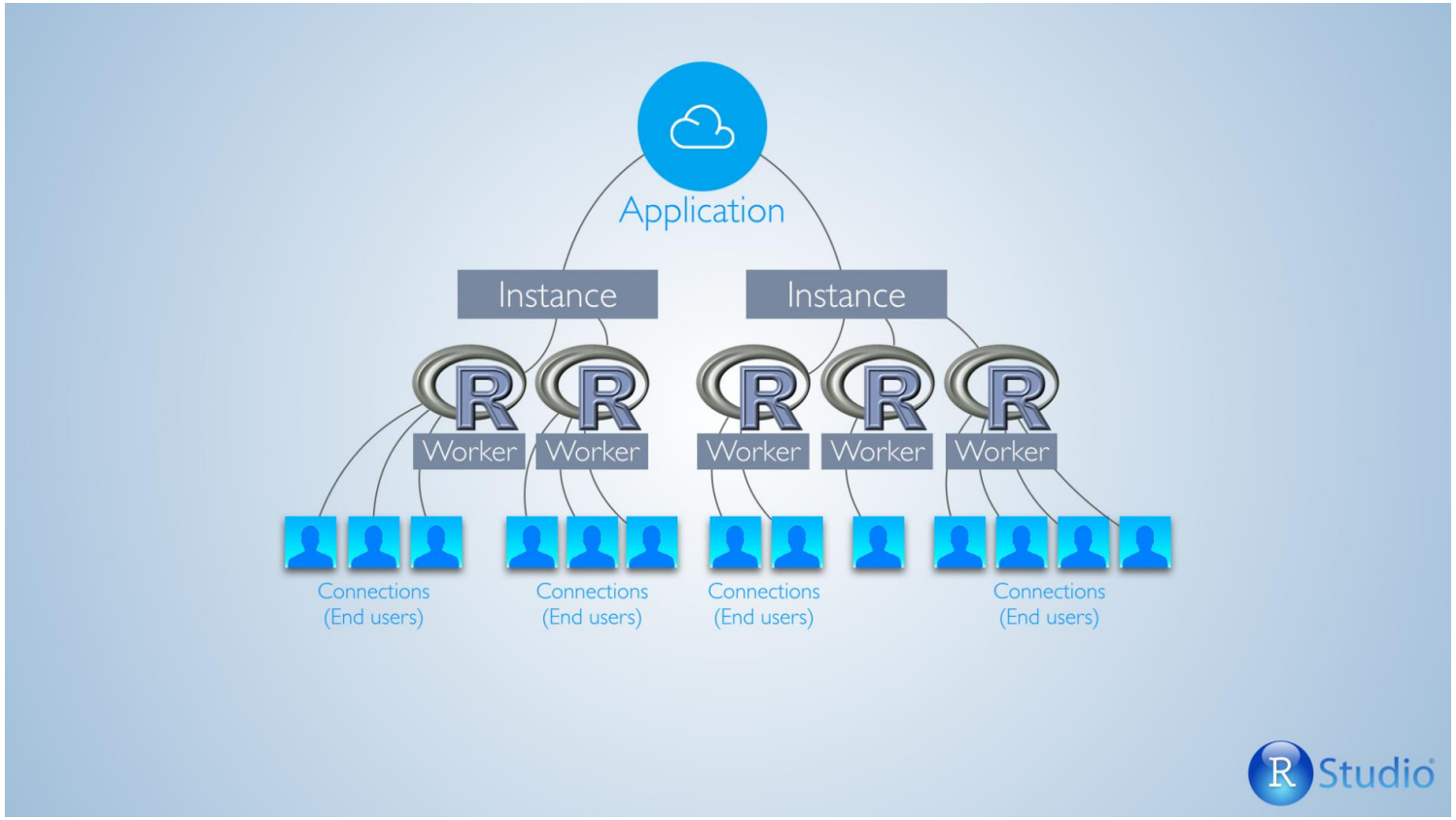


Publishing a Shiny application

Follow the prompted instructions to publish your application



Shinyapps.io – Scaling and Performance



Shinyapps.io – Scaling and Performance Settings

App settings:

- Connection Timeout – time after an idle app is stopped (default: 15 min)

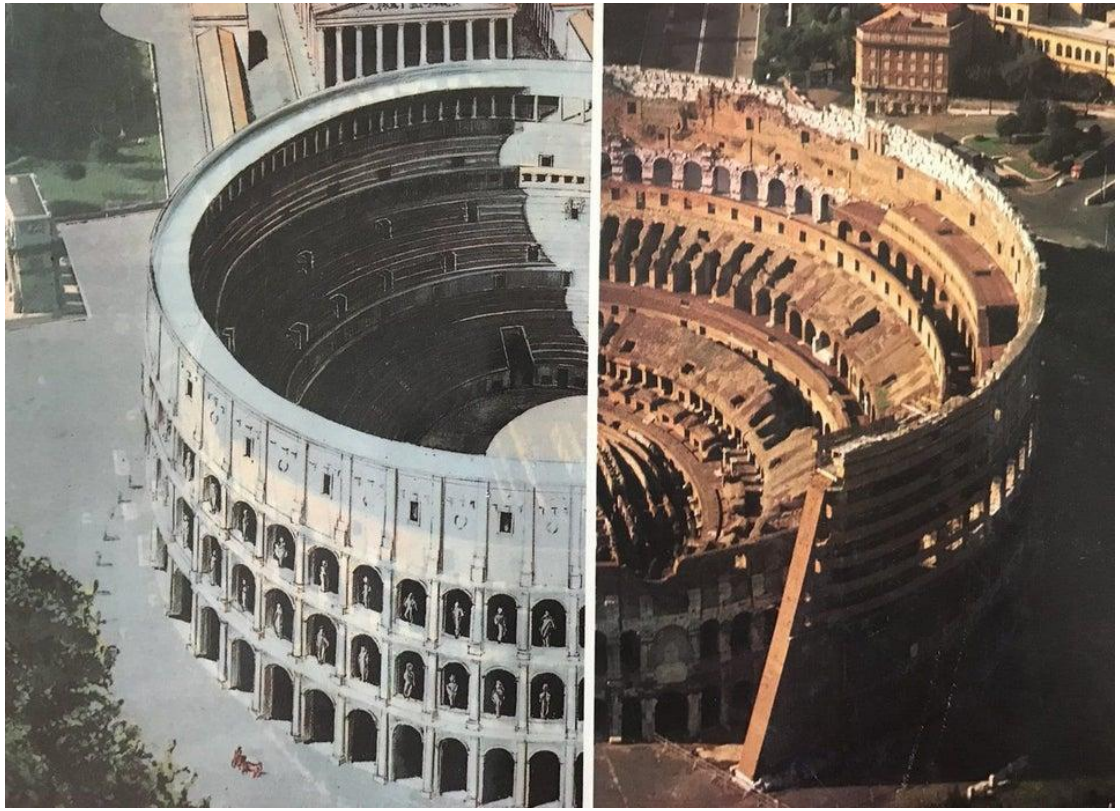
Multiple users:

- R is single-threaded
- More worker processes can be added to serve multiple users at the same time
- Application instances are virtualised servers to serve the app (restricted by plan, up to 10 allowed)

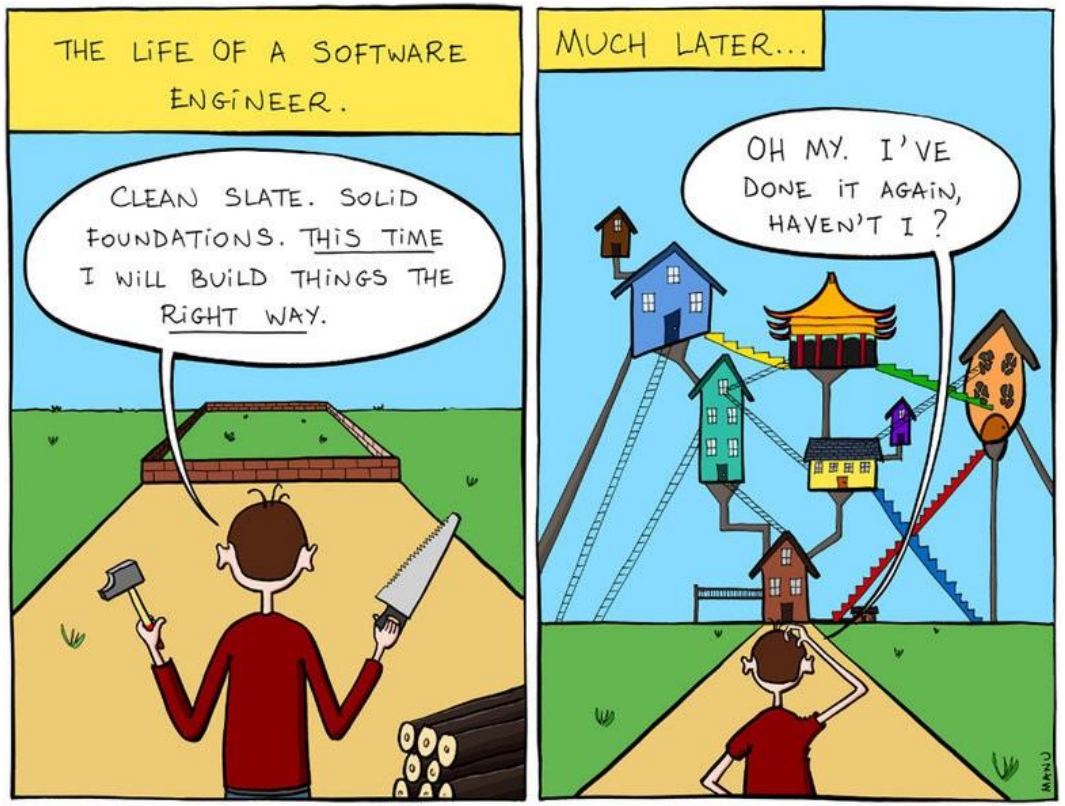
Shinyapps.io – Trouble shooting

- Instance Load Factor
- Worker Load Factor
- Max worker processes
- Max # of concurrent connections supported per worker

Software as a living organism



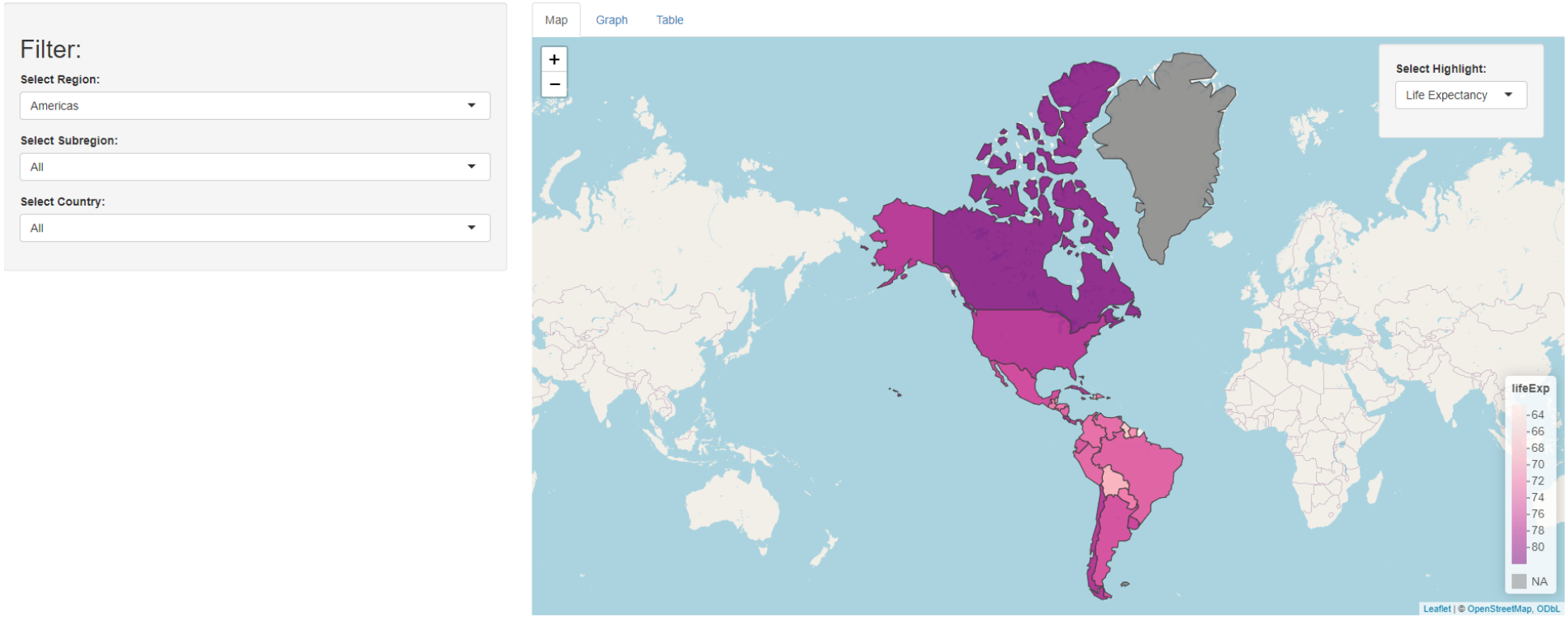
http://www.ferhatgokce.com/wp-content/uploads/2019/05/Kolezyum-Bilet-T%C3%BCrleri.jpg



Extended Exercise

Extended Exercise

- Let's try to combine everything we have learned so far!



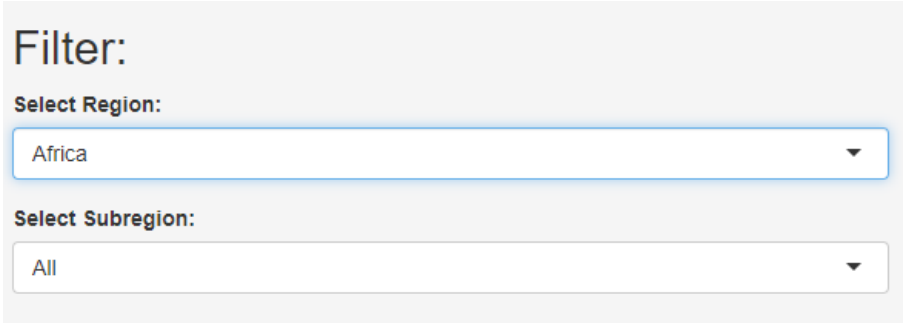
EPI-interactive

To do:

In *stage1*:

- Create a tabsetPanel with three tabPanels for a map, graph, and table
- Create a filter that filters by region, subregion, and country
- Add a map which will have the filtered countries highlighted (including a legend)

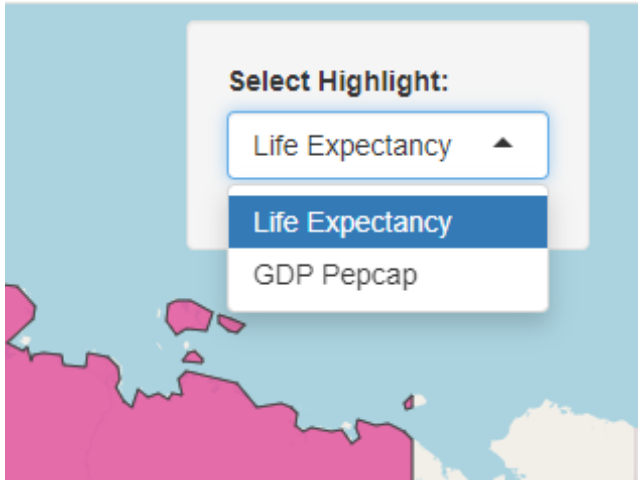
Optional: Add conditionalPanels to these filters to only display the next filter if the previous one is not "All"

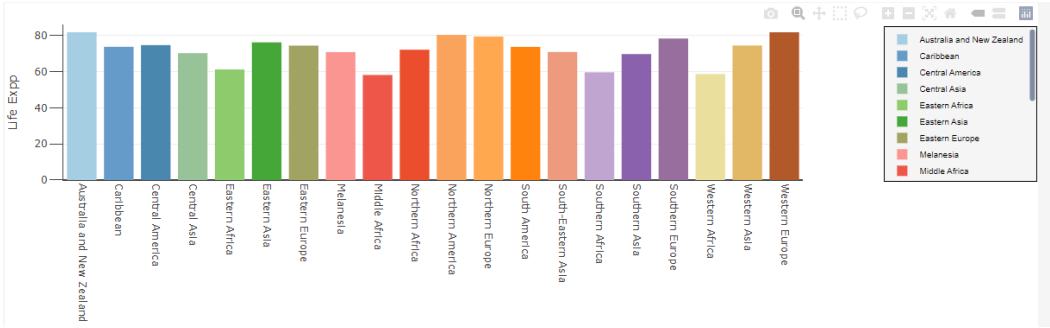


To do:

Continuing from the last exercise or starting at *stage2*:

- Add a selectInput to the map to choose whether to highlight the map based on Life Expectancy or GDP Percap. Reflect these changes in the map highlights and legend.
- Add a graph to the graph tabPanel to display subregion (x) and lifeExp/gdpPercap (y).





EPI-interactive

To do:

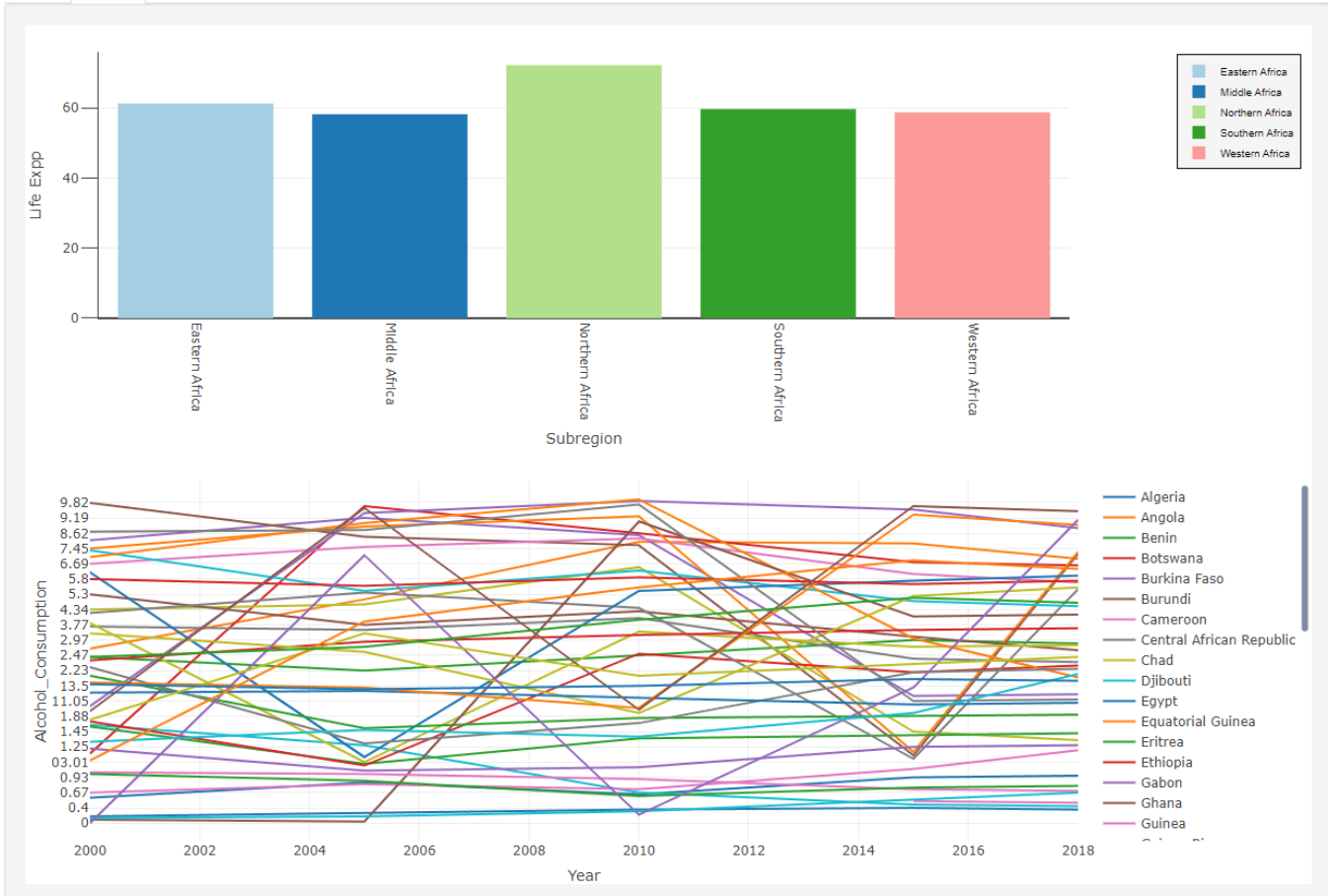
Filter:

Select Region:

Africa

Select Subregion:

All

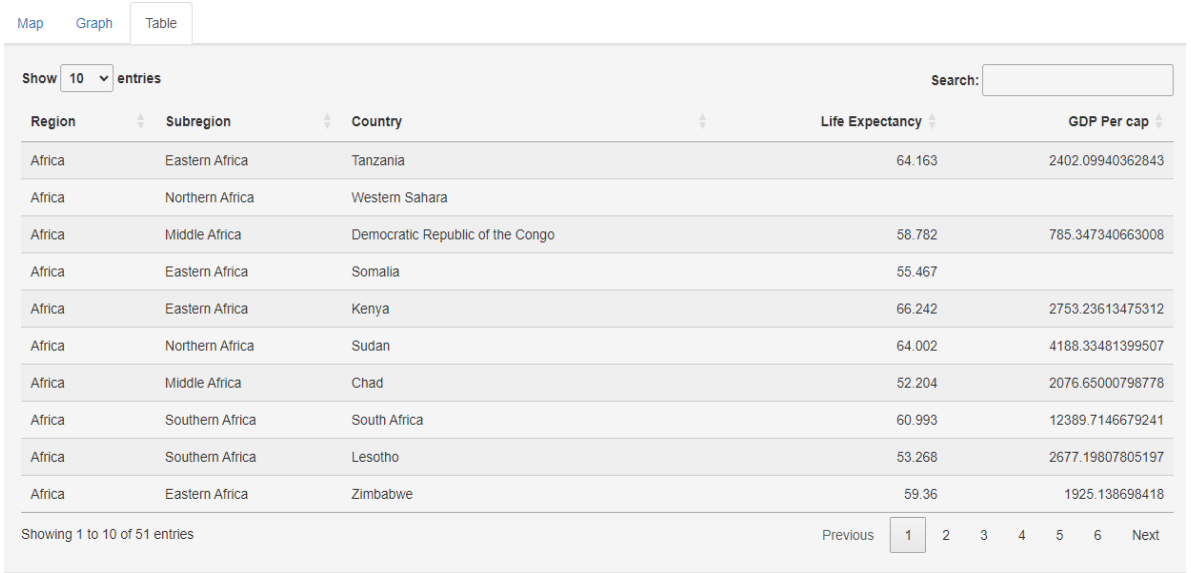


EPI-interactive

To do:

Continuing from the last exercise or starting at *stage3*:

- Create a second plot in the Graph tabPanel to show the alcohol consumption over time for the filtered countries.
- Create a table in Table tabsetPanel which provides the shows the filtered data. (Make sure to rename the column names to something appropriate)



Region	Subregion	Country	Life Expectancy	GDP Per cap
Africa	Eastern Africa	Tanzania	64.163	2402.09940362843
Africa	Northern Africa	Western Sahara		
Africa	Middle Africa	Democratic Republic of the Congo	58.782	785.347340663008
Africa	Eastern Africa	Somalia	55.467	
Africa	Eastern Africa	Kenya	66.242	2753.23613475312
Africa	Northern Africa	Sudan	64.002	4188.33481399507
Africa	Middle Africa	Chad	52.204	2076.65000798778
Africa	Southern Africa	South Africa	60.993	12389.7146679241
Africa	Southern Africa	Lesotho	53.268	2677.19807805197
Africa	Eastern Africa	Zimbabwe	59.36	1925.138698418

Optional: There is an error one of the alcohol consumption data points (Libya) how can you remove/correct this?

Optional:

- Add a download button to the Table panel to download the filtered data as a csv.
- Add/change the map hovers.

Next time

- Case Study
- Top 10 Data visualisation tips
- Q and A
- Wrap up

Challenge:

Complete the extended exercise, publish your work on shinyapps.io or share your work with us on the session 7 forum!