

surveydown

An open-source platform for programmable,
markdown-based surveys

Pingfan Hu

George Washington University

USRSE' 25



I try to figure out what people want...





Prof. John
Helveston



jhelvy.shinyapps.io

🦹 Welcome to the Ultimate Superhero Survey! 🦹

Thank you for participating in our research on superhero preferences and powers! This survey will help us understand what makes superheroes appealing to different people.

This survey should take about 3-5 minutes to complete.

Do you have a favorite super hero? *

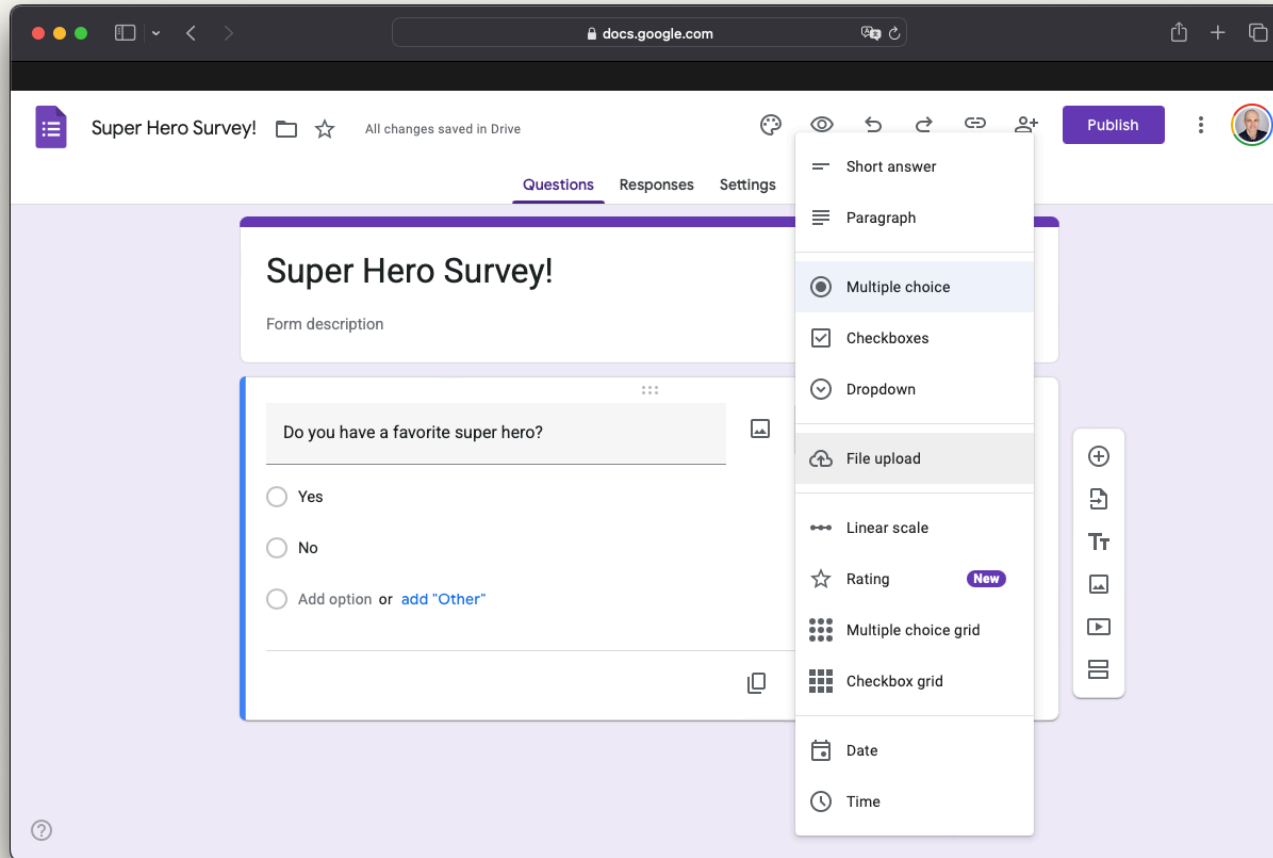
Yes

No

Next

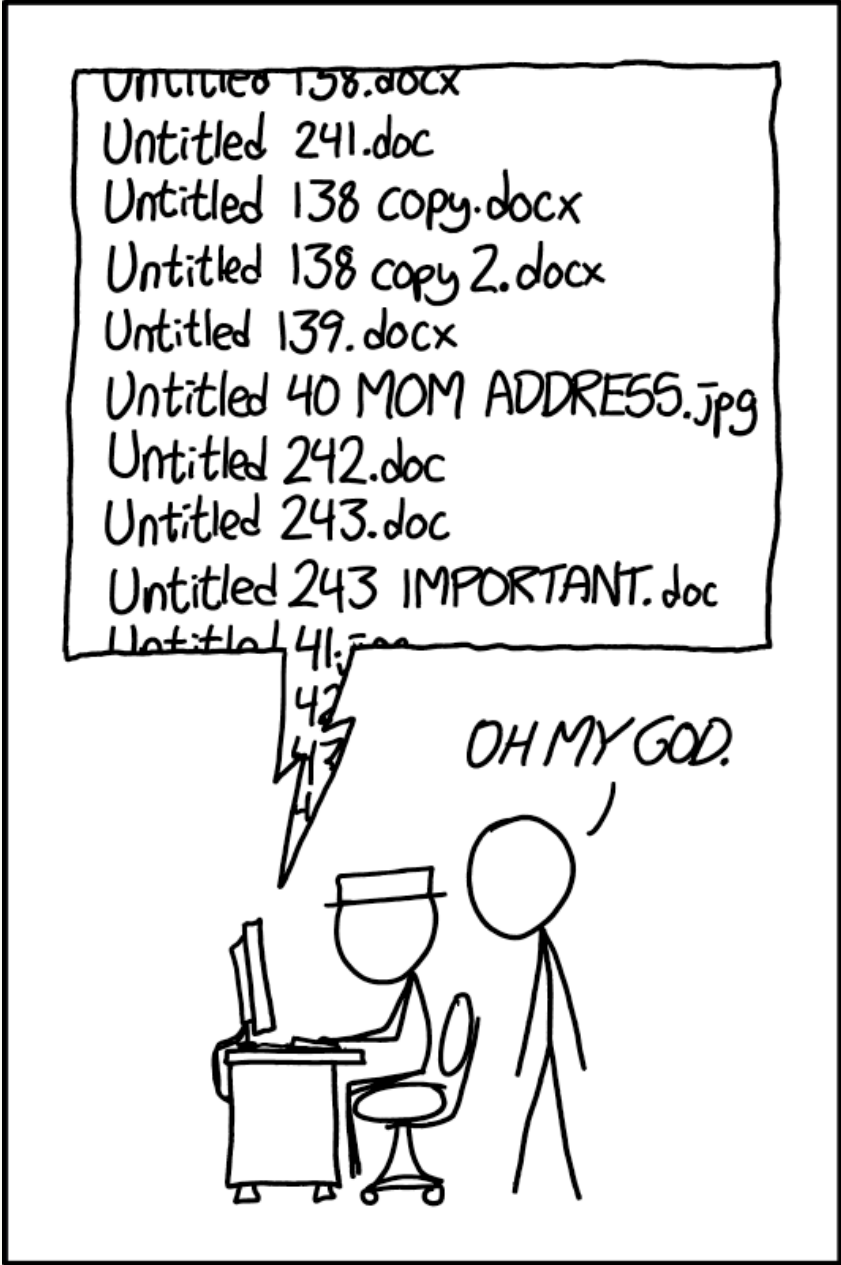
WYSIWYG Interface

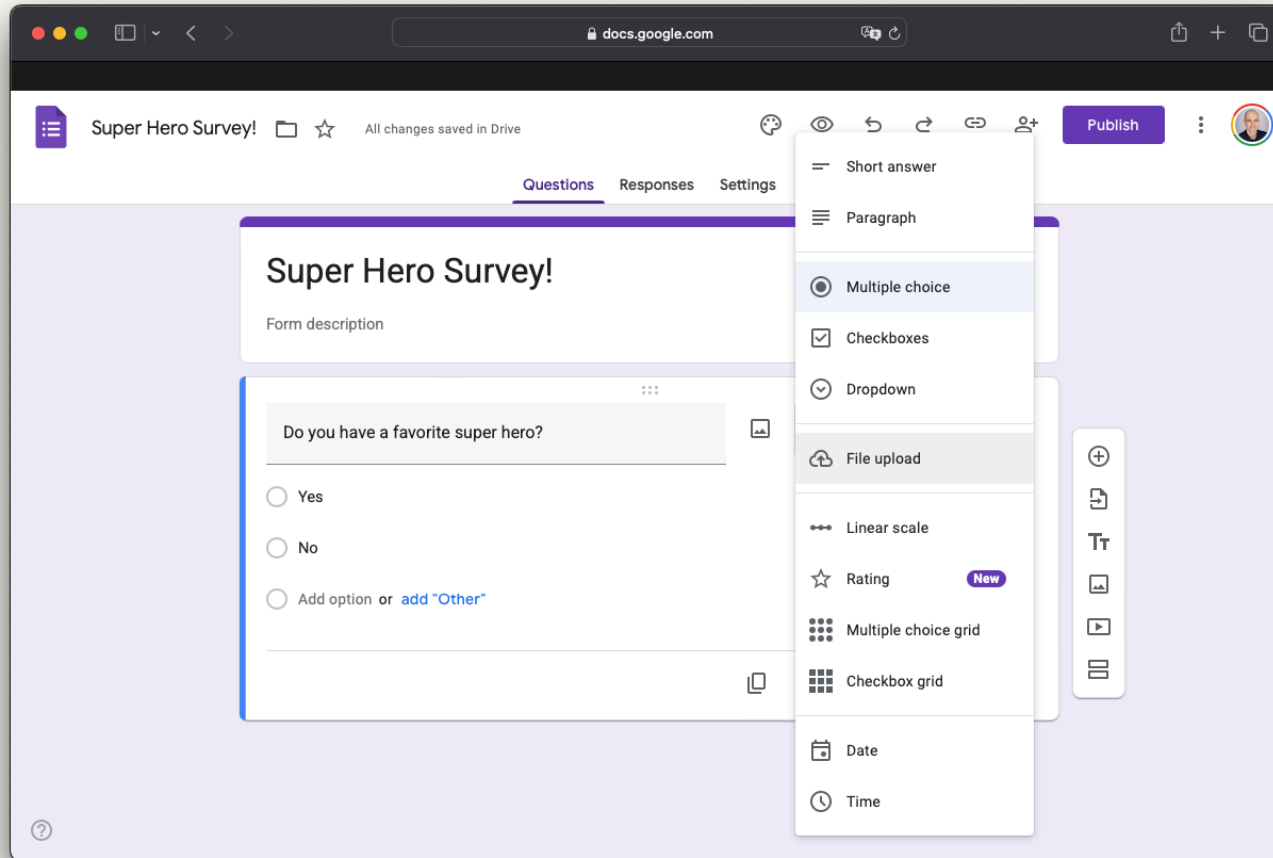
The screenshot shows the Google Forms editor interface. At the top, the browser address bar displays 'docs.google.com'. The document title is 'Super Hero Survey!' with a star icon and the text 'All changes saved in Drive'. The navigation bar includes 'Questions', 'Responses', and 'Settings' tabs. A 'Publish' button and a user profile icon are also visible. The main editing area shows a question titled 'Super Hero Survey!' with a 'Form description' field. Below this, a question is being edited: 'Do you have a favorite super hero?'. The question has three radio button options: 'Yes', 'No', and 'Add option or add "Other"'. A context menu is open over the question, listing various question types: Short answer, Paragraph, Multiple choice (selected), Checkboxes, Dropdown, File upload, Linear scale, Rating (marked 'New'), Multiple choice grid, Checkbox grid, Date, and Time. A vertical toolbar on the right side of the editor contains icons for adding new questions, inserting images, and other editing tools.



Limitations

- ✗ Reproducibility
- ✗ Version control





Limitations

- ✗ Reproducibility
- ✗ Version control
- ✗ Limited features
- ✗ Open source

Why not make surveys
from **code**?

~~Limitations~~

Features

- ✓ Reproducibility
- ✓ Version control
- ✓ Lots of features
- ✓ Open source

Introducing **surveydown**!



In this talk, we will cover:

What is surveydown?

How does it work?

What can I do with it?

What's next?

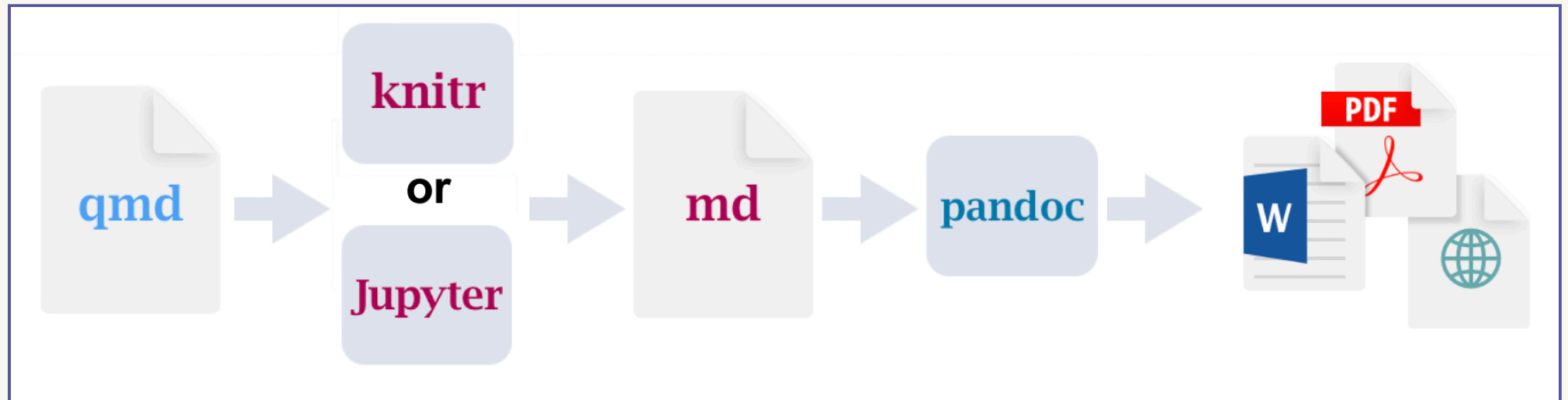
What is **surveydown**?



R package that renders Quarto files into surveys



Quarto is a publishing system

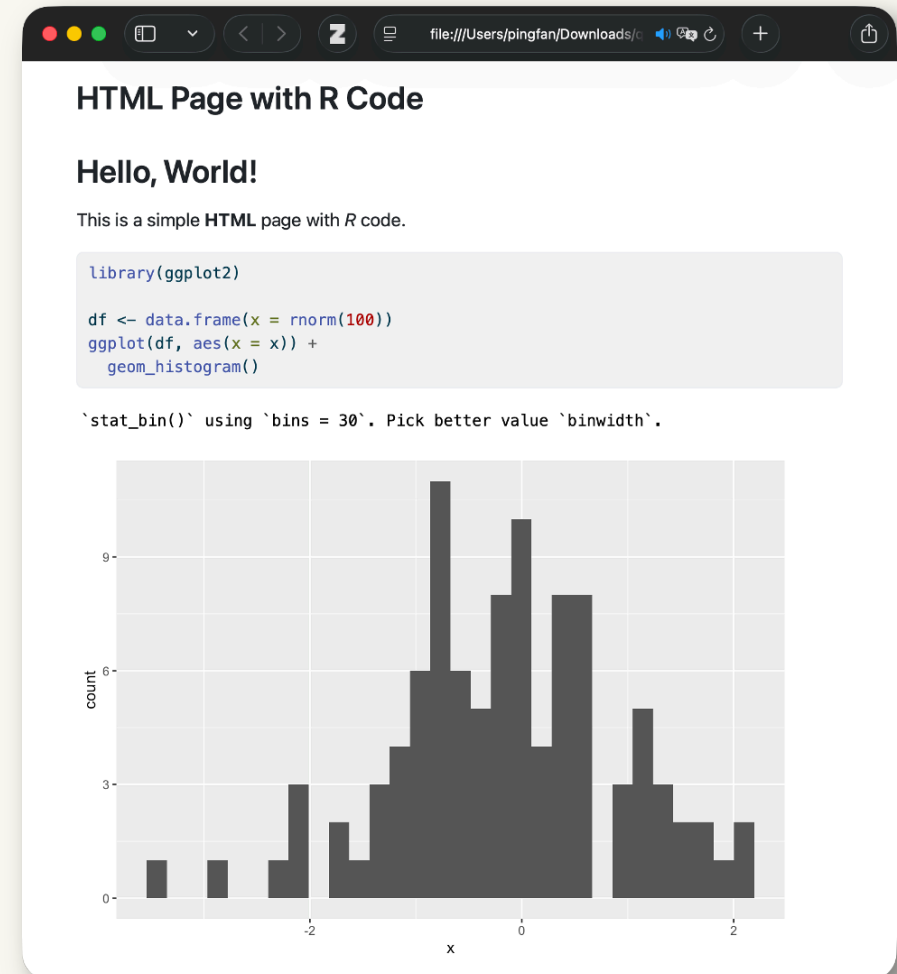


Original qmd file

Rendered HTML

Markdown + R code chunks

```
1 ---
2 format: html
3 title: "HTML Page with R Code"
4 ---
5
6 # Hello, World!
7
8 This is a simple HTML page with R code.
9
10 ```{r}
11 library(ggplot2)
12
13 df <- data.frame(x = rnorm(100))
14 ggplot(df, aes(x = x)) +
15   geom_histogram()
16 ```
```

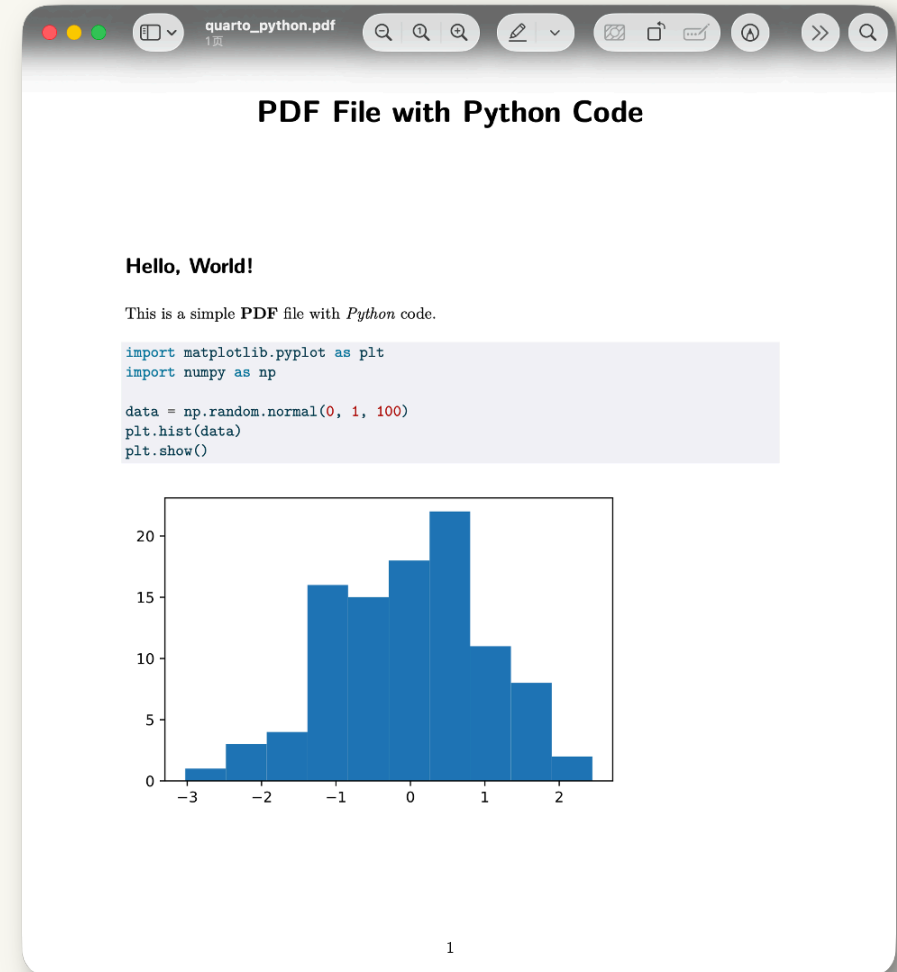


Original qmd file

Rendered PDF

Markdown + Python code chunks

```
1 ---
2 format: pdf
3 title: "PDF File with Python Code"
4 ---
5
6 # Hello, World!
7
8 This is a simple **PDF** file with *Python* code.
9
10 ```{python}
11 import matplotlib.pyplot as plt
12 import numpy as np
13
14 data = np.random.normal(0, 1, 100)
15 plt.hist(data)
16 plt.show()
17 ```
```

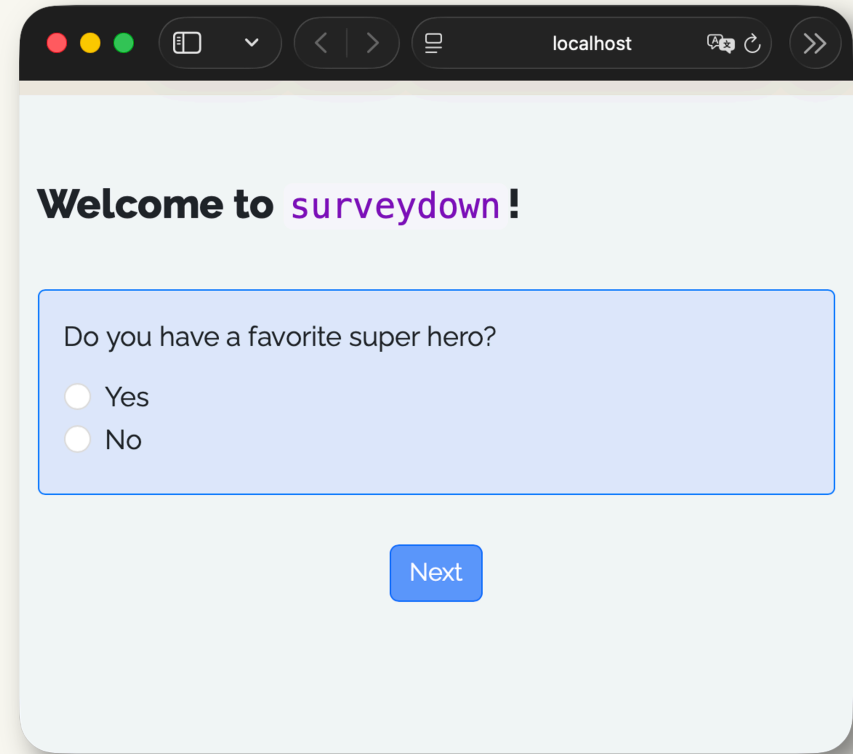




+



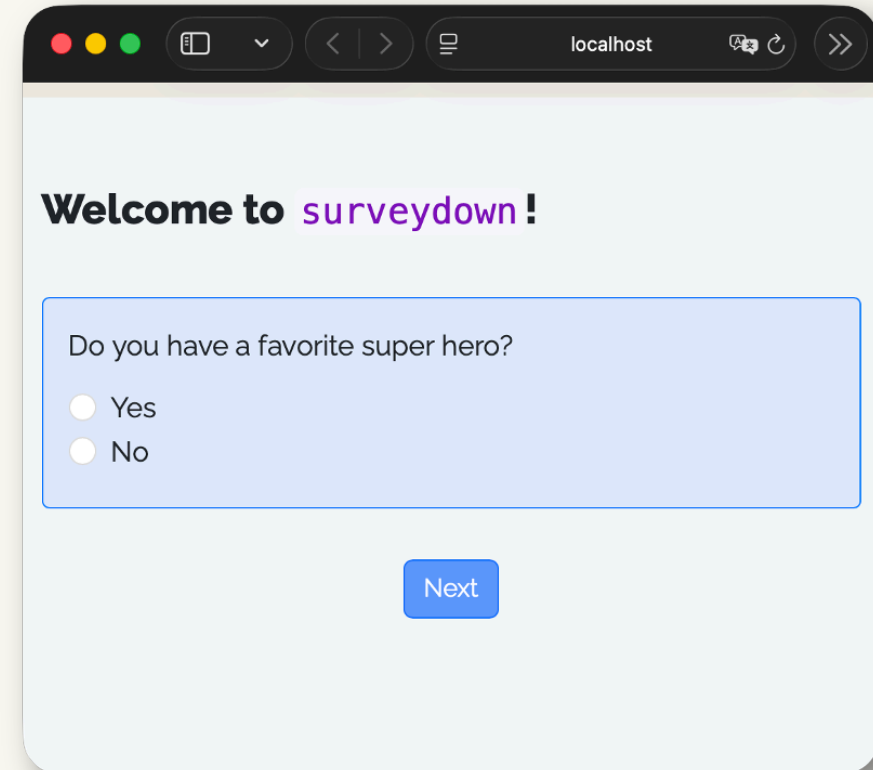
=



survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id   = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

Rendered Survey



survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id    = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

YAML header for a “clean” output

survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id    = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

Load the surveydown Package

survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id   = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

Use Quarto fences (:::)
to define survey pages

survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id   = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

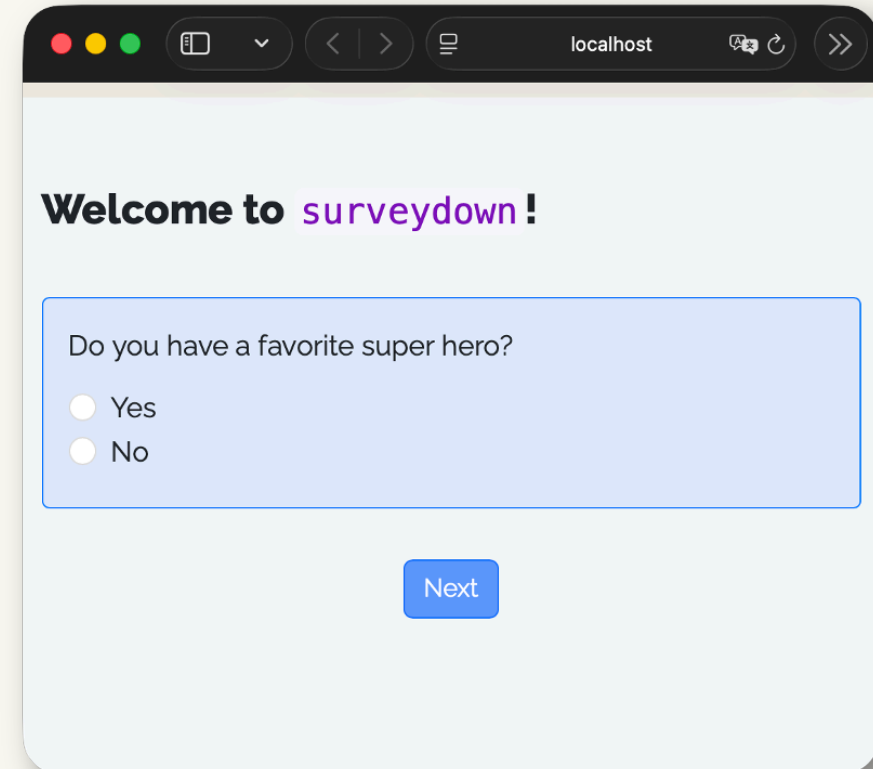
Page content

- Markdown for texts, images, etc.
- `sd_question()` for survey questions
- `sd_next()` for page navigation

survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id   = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

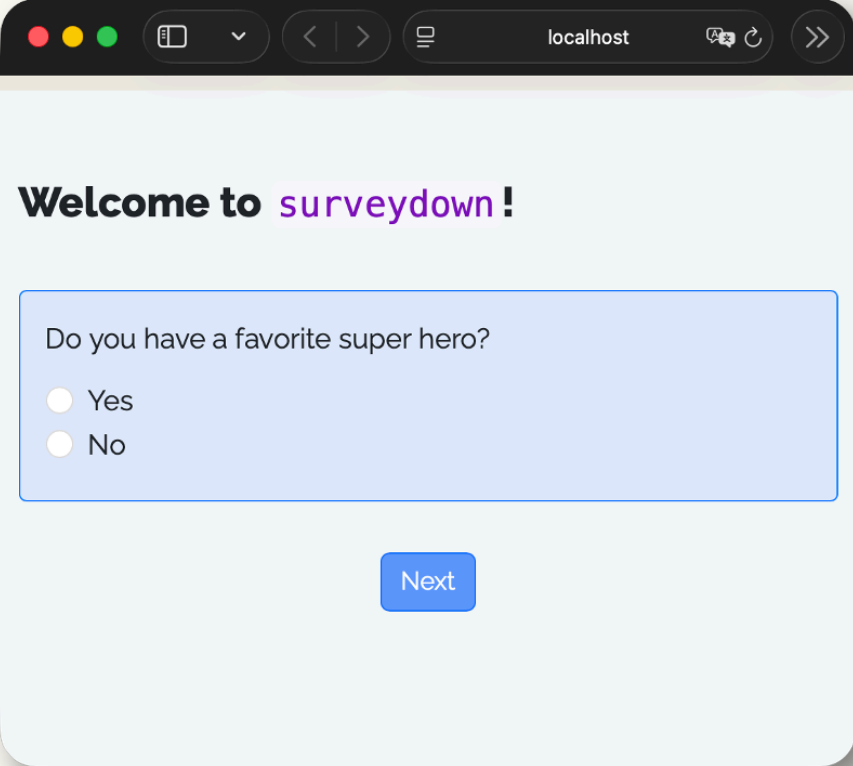
Rendered Survey



survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 ::: {#welcome .sd-page}
12
13 # Welcome to `surveydown`!
14
15 ```{r}
16 sd_question(
17   type = "mc",
18   id   = "has_fav_hero",
19   label = "Do you have a favorite super hero?",
20   option = c(
21     "Yes" = "yes",
22     "No"  = "no"
23   )
24 )
25
26 sd_next()
27 ```
28
29 :::
```

Rendered Survey



localhost

Welcome to surveydown!

Do you have a favorite super hero?

Yes

No

Next

has_fav_hero
yes
no
no
yes

Wait a minute...

Quarto renders to **static** html pages, right?



Shiny to the rescue!

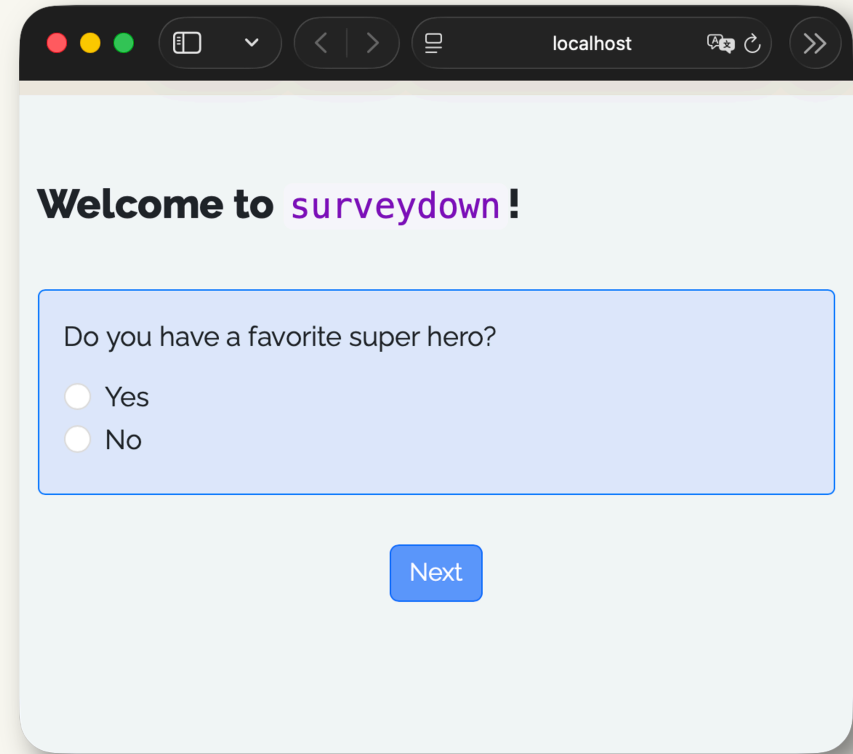




+



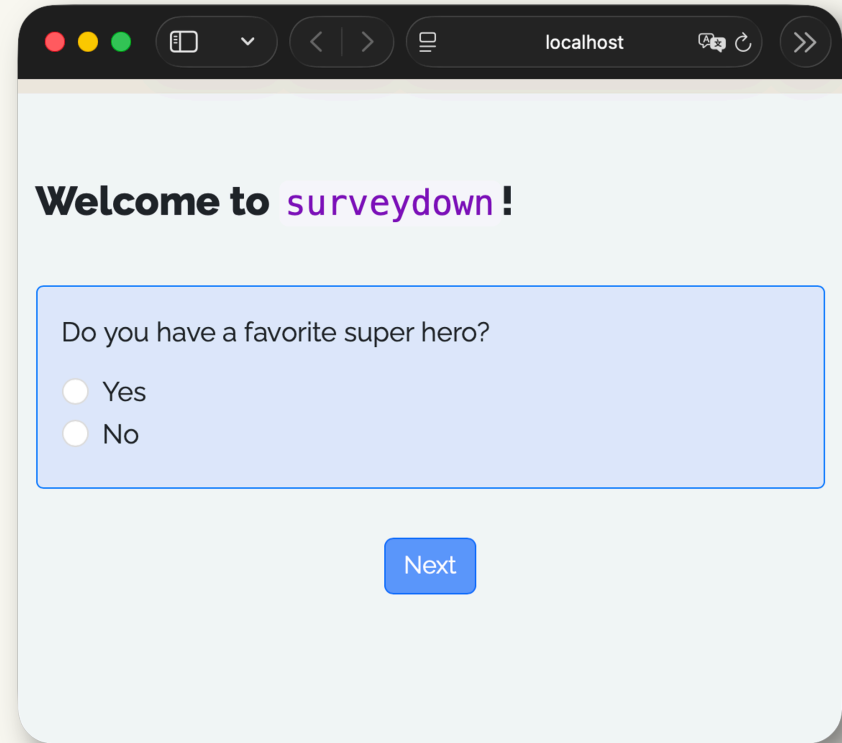
=



Shiny App



UI

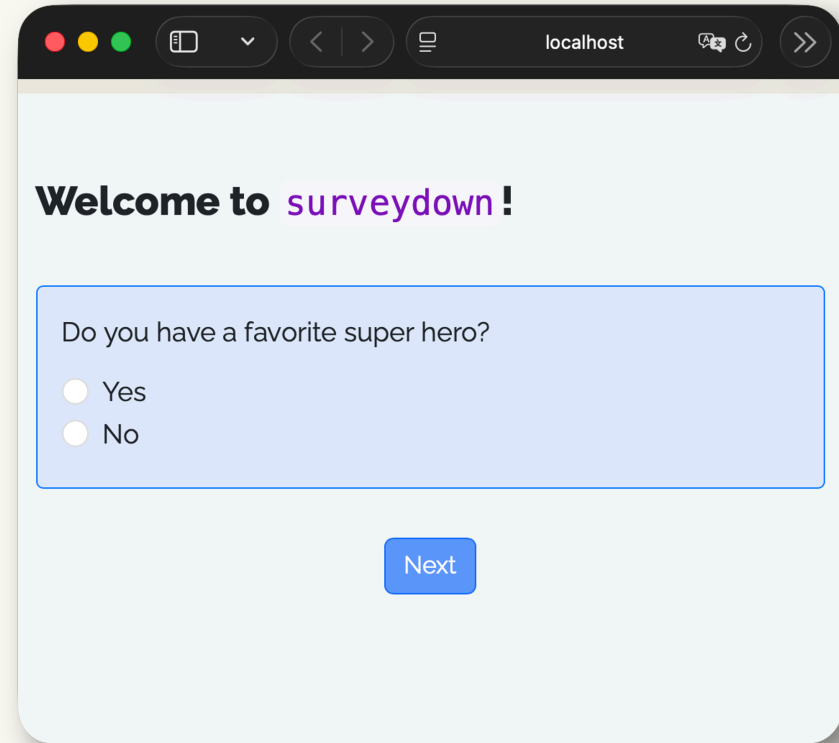


Shiny App

UI



Server



A complete surveydown survey

`survey.qmd`

A **Quarto doc** defining the survey content (pages, texts, images, questions, etc).

`app.R`

An **R script** defining the survey Shiny app.

Don't panic!



app.R

```
1 library(surveydown)
2
3 ui ← sd_ui()
4
5 server ← function(input, output, session) {
6
7   sd_server()
8
9 }
10
11 shiny::shinyApp(ui = ui, server = server)
```

app.R

```
1 library(surveydown)
2
3 ui ← sd_ui()
4
5 server ← function(input, output, session) {
6
7   sd_server()
8
9 }
10
11 shiny::shinyApp(ui = ui, server = server)
```

Render `survey.qmd` as UI

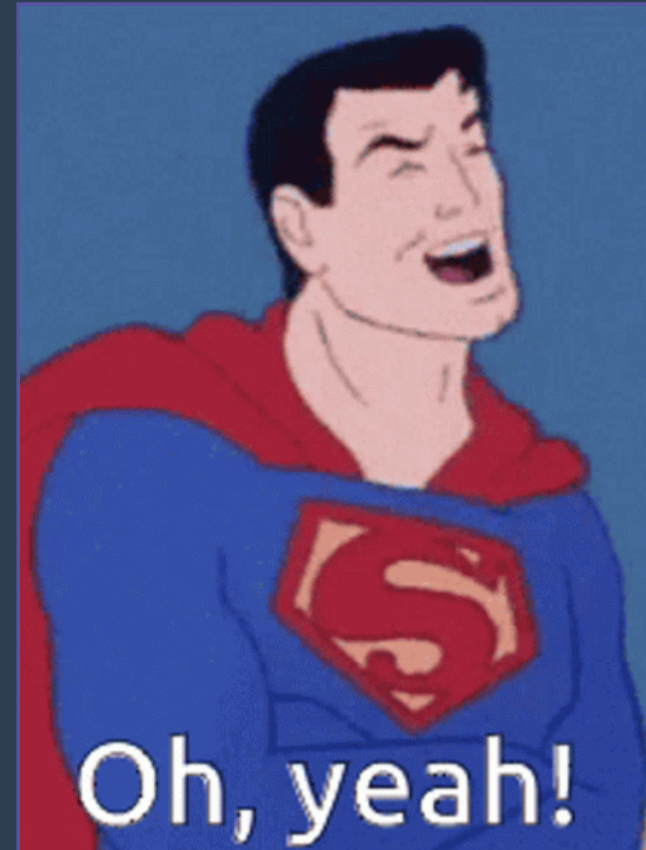
Run the `surveydown` server

Wait a minute...

How do you store the response **data**?



PostgreSQL to the rescue!



The screenshot displays the Supabase Table Editor interface. The browser address bar shows 'supabase.com'. The navigation bar includes 'Demo Free', 'surveydown', 'main Production', and a 'Connect' button. The interface is divided into a left sidebar, a main table view, and a bottom control bar.

Table Editor

schema public

+ New table

Search tables...

- coders
- data
- demo
- demo2
- evRangeSurvey
- leaf_miles
- my_test_table
- mydata
- mytable1
- newtable
- responses
- slider_test
- slider_test2
- slider_test3
- speedtest
- superheros**
- temn

Filter Sort Insert

Add RLS policy Role postgres Realtime off API Docs

<input type="checkbox"/>	session_id text	has_fav_hero text	fav_hero_name text	hero_universe text
<input type="checkbox"/>	064585d4b3ce857a4a24e9dea4a657da	no	NULL	NULL
<input type="checkbox"/>	14d82544a547922107f492e6ee9a67dc	no	NULL	NULL
<input type="checkbox"/>	1eb83f38450cc4fa5b3bc8540d161f38	yes	Superman	dc
<input type="checkbox"/>	4ef1e74ae94737c502edb08db8e27f77	yes	NULL	marvel
<input type="checkbox"/>	5cf0f43d847425de2d015e1145ac3199	yes	Spiderman	all
<input type="checkbox"/>	676ae2ebd611f7fe70586c23af5b53c	NULL	NULL	NULL
<input type="checkbox"/>	68fe326c20852efae79bca9b0b089815	no	NULL	NULL
<input type="checkbox"/>	6f436b4a64f154324ad6c4c883e99002	yes	Monkey King	marvel
<input type="checkbox"/>	8352cbbaad349838729c489c43f08c4f	yes	Spiderman	dc
<input type="checkbox"/>	86e11fbaa660bc1d94b686fd0206b55d	yes	Superman	all
<input type="checkbox"/>	a426816365182d50dc133ee0c6255b3d	yes	NULL	NULL
<input type="checkbox"/>	a754b629d48ad2c53049c6741e9d4645	no	NULL	NULL
<input type="checkbox"/>	bb7021e8ad7e35be6d75831a2f5c51cd	yes	Spiderman	all
<input type="checkbox"/>	bbe8c56090359bb4eb37e58b95b31316	yes	Spider Man	marvel

Page 1 of 1 100 rows 20 records Refresh Data Definition

app.R

```
1 library(surveydown)
2
3 # sd_db_config()
4 db ← sd_db_connect()
5
6 ui ← sd_ui()
7
8 server ← function(input, output, session) {
9
10   sd_server(db)
11
12 }
13
14 shiny::shinyApp(ui = ui, server = server)
```

Store credentials
Connect to the database

Pass connection to
sd_server()

```
demo - main - RStudio
Go to file/function
Addins
survey.qmd x app.R x analysis.R x
Source on Save Run Source
1 library(surveydown)
2 library(dplyr)
3
4 db <- sd_db_connect()
5
6 data <- sd_get_data(db = db)
7
8 glimpse(data)
9

Console Terminal Background Jobs
R 4.4.1 · ~/gh/slides/2025-posit-conf-surveydown/demo/
> db <- sd_db_connect()
✓ Successfully connected to the database.
>
> data <- sd_get_data(db = db)
>
> glimpse(data)
Rows: 20
Columns: 50
$ session_id <chr> "5cf0f43d847425..."
$ time_start <chr> "2025-08-15 15:..."
$ time_end <chr> "2025-08-15 15:..."
$ completion_code <chr> "37081685", "60..."
$ browser <chr> "Safari v26, iO..."
$ ip_address <chr> "140.248.0.0", ...
$ has_fav_hero <chr> "yes", "yes", "...
$ fav_hero_name <chr> "Spiderman", "S...
$ hero_universe <chr> "all", "dc", "a...
$ hero_qualities <chr> "strength, flyi...
$ dream_power <chr> "telepathy", "t...
$ responsibility_scale <chr> "10", "8.1", "1...
$ villain_encounter <chr> "help_backup", ...
$ superhero_rating <chr> NA, NA, NA, NA, ...
$ superhero_rating_spiderman <chr> "love", "love", ...
$ superhero_rating_batman <chr> "love", NA, "li...
$ superhero_rating_wonder_woman <chr> "love", NA, "li...
```

What is **surveydown**?



Control Logic

Data Storage

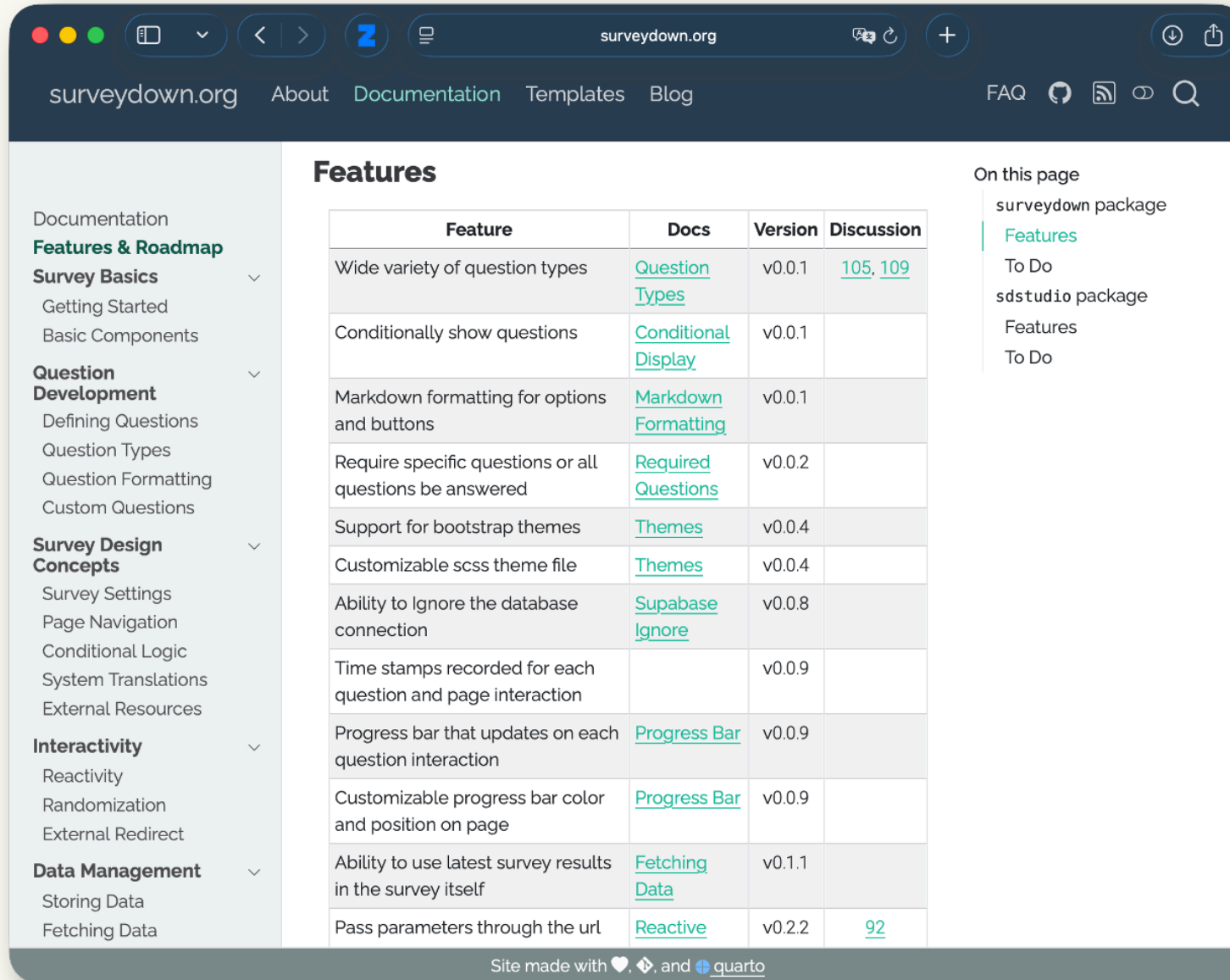


Survey Design

Web Framework

What can **surveydown** do?

surveydown is feature-packed!



The screenshot shows the surveydown.org website. The main content is a table titled "Features" with columns for Feature, Docs, Version, and Discussion. The table lists 14 features, including question types, conditional display, markdown formatting, required questions, themes, database connection, progress bars, and data management. A sidebar on the left contains a navigation menu with categories like "Documentation", "Survey Basics", "Question Development", "Survey Design Concepts", "Interactivity", and "Data Management". A right sidebar titled "On this page" lists "surveydown package" and "sdstudio package" with sub-links for "Features" and "To Do". The footer of the page states "Site made with ❤️, 📦, and 📄 quarto".

Feature	Docs	Version	Discussion
Wide variety of question types	Question Types	v0.0.1	105 , 109
Conditionally show questions	Conditional Display	v0.0.1	
Markdown formatting for options and buttons	Markdown Formatting	v0.0.1	
Require specific questions or all questions be answered	Required Questions	v0.0.2	
Support for bootstrap themes	Themes	v0.0.4	
Customizable scss theme file	Themes	v0.0.4	
Ability to ignore the database connection	Supabase Ignore	v0.0.8	
Time stamps recorded for each question and page interaction		v0.0.9	
Progress bar that updates on each question interaction	Progress Bar	v0.0.9	
Customizable progress bar color and position on page	Progress Bar	v0.0.9	
Ability to use latest survey results in the survey itself	Fetching Data	v0.1.1	
Pass parameters through the url	Reactive	v0.2.2	92

Feature Highlights

Question types

Conditional logic

12 Built-in Question Types

text

textarea

numeric

mc

mc_multiple

mc_buttons

mc_multiple_buttons

select

slider

slider_numeric

date

daterange

Question Type: text

```
1 sd_question(  
2   type = "text",  
3   id   = "fav_hero_name",  
4   label = "Who is your favorite super hero?"  
5 )
```



Who is your favorite super hero?

Question Type: mc_buttons

```
1 sd_question(  
2   type = "mc_buttons",  
3   id   = "dream_power",  
4   label = "If you could have ONE superpower?",  
5   option = c(  
6     "🕸 Web-slinging" = "webslinging",  
7     "🛡 Super Strength" = "strength",  
8     "✈ Flight" = "flight",  
9     "🧠 Telepathy" = "telepathy",  
10    "⚡ Super Speed" = "speed"  
11  ),  
12  direction = "vertical"  
13 )
```



If you could have ONE superpower?

🕸 Web-slinging
Swing through cities

🛡 Super Strength
Lift anything

✈ Flight
Soar through the skies

🧠 Telepathy
Read minds

⚡ Super Speed
Faster than lightning

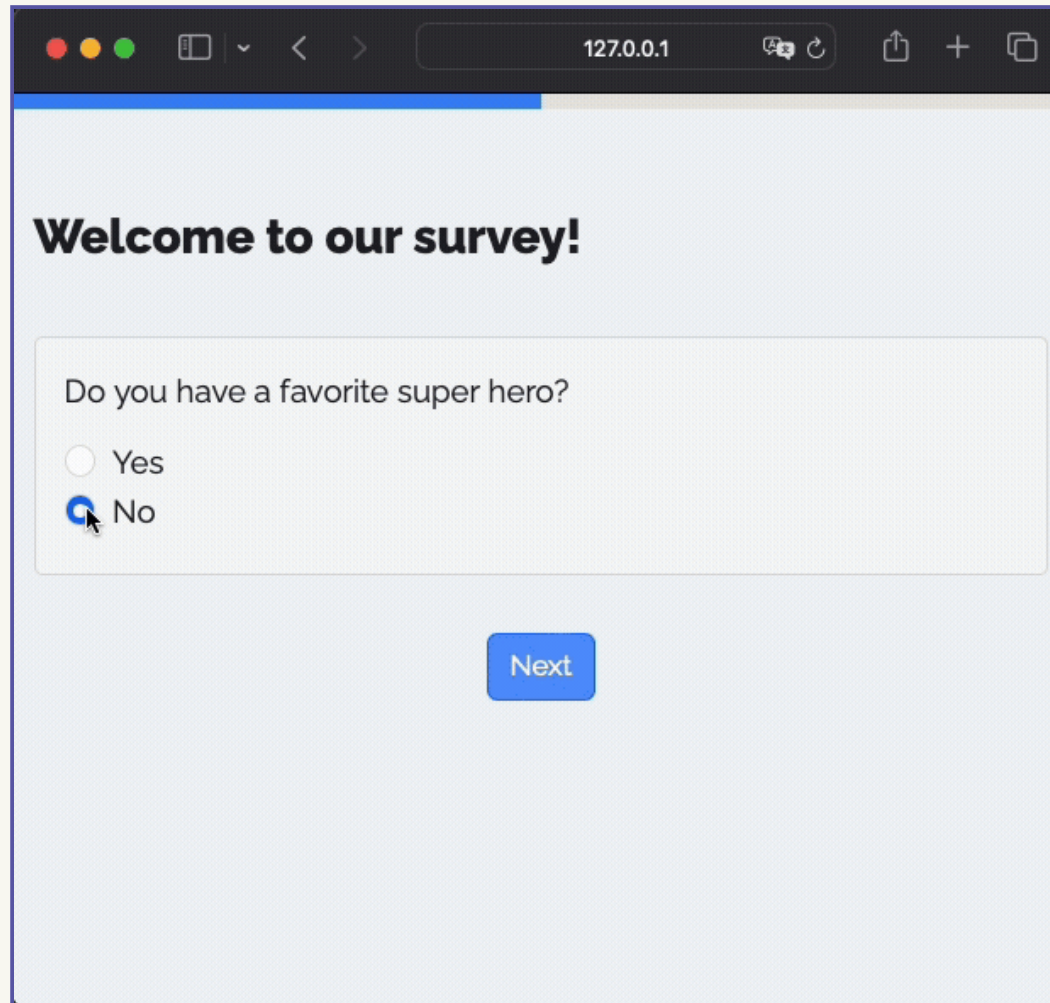
Conditional logic

Conditional showing

Conditional skipping

Conditional stopping

Conditional showing - `sd_show_if()`



A screenshot of a web browser window displaying a survey. The browser's address bar shows the URL `127.0.0.1`. The survey content is as follows:

Welcome to our survey!

Do you have a favorite super hero?

Yes

No

Next

Conditional showing - `sd_show_if()`

survey.qmd

```
1 # Conditional Question
2 sd_question(
3   type = "mc",
4   id   = "has_fav_hero",
5   label = "Do you have a favorite hero?",
6   option = c("Yes" = "yes", "No" = "no")
7 )
8
9 # Target Question
10 sd_question(
11   type = "text",
12   id   = "fav_hero",
13   label = "Who is your favorite super hero?"
14 )
```

app.R

```
1 # Inside server
2 sd_show_if(
3   input$has_fav_hero == "yes" ~ "fav_hero"
4 )
```

Condition ~ Target

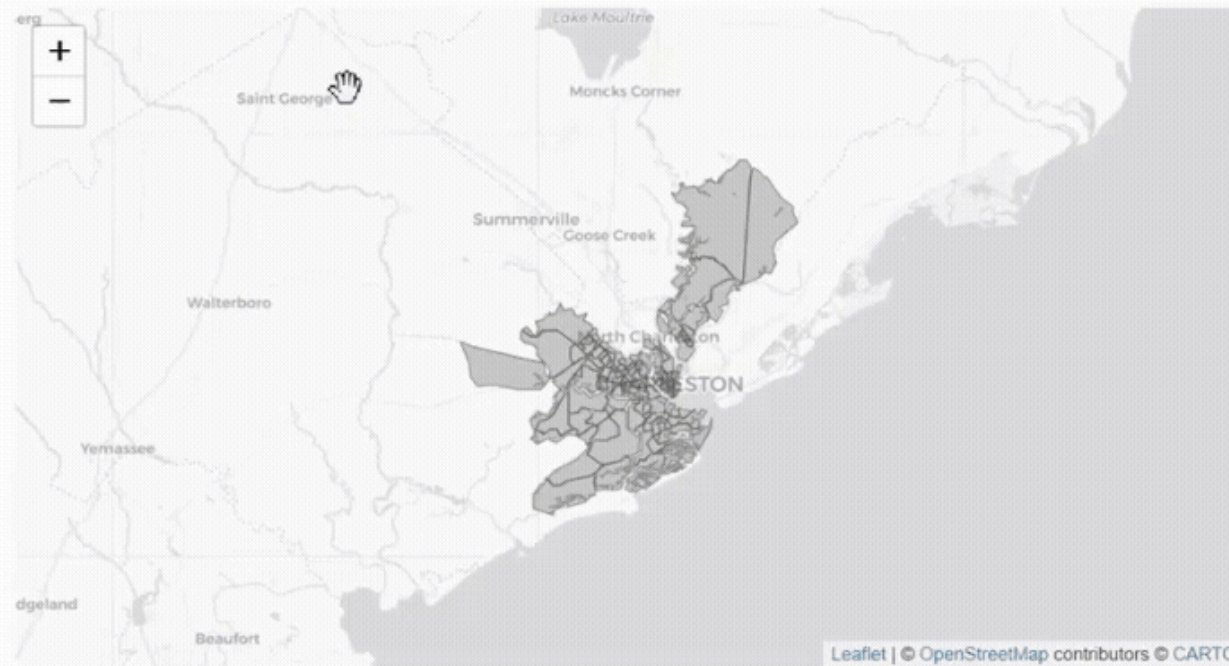
“If {condition}, then show {target}”

If it works in **Shiny**,
it works in **surveydown**.

Embedding an interactive map with Leaflet:

Question 1: Social Vulnerability is how likely people are to face greater harm or impact on their lives after disruptive hazard events like flooding based on social or economic conditions like income or transportation access.

Please review the map of the City of Charleston, South Carolina, and select the areas you believe are more socially vulnerable to the impacts of hazardous events.

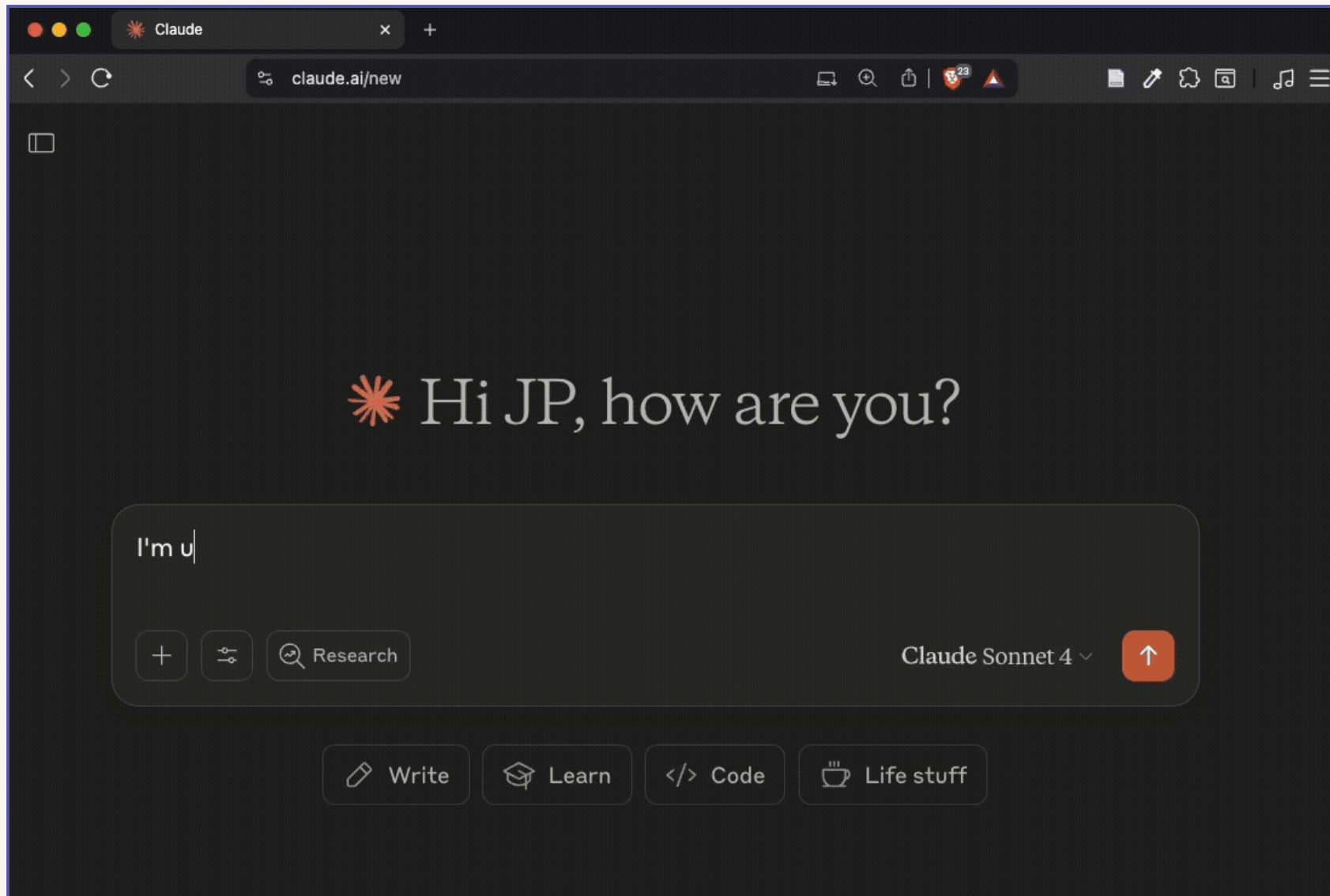


Next Question



surveydown + LLMs
is pretty cool

Generate surveys with LLMs!



What's next?

Try out the companion `sdstudio` package:

```
sdstudio::launch()
```

surveydown Studio Build Preview Responses

Structure

- Page: welcome
 - # 🦸 Welcome to the...
 - has_fav_hero | mc
Do you have a favorite super hero?
 - fav_hero_name | text
Who is your favorite super hero?
- Page: hero_details
 - # Tell us about your...
 - hero_universe | mc
Which superhero universe do you prefer?
 - hero_qualities | mc_multiple
What qualities do you find most appealing in superheroes? (Select all that apply)
- Page: powers
 - # If you could have...

Code

```

survey.qmd  app.R
1 ---
2 format: html
3 echo: false
4 warning: false
5 theme: [superhero, custom.scss]
6 barcolor: "#e74c3c"
7 ---
8
9 ```${r}```
10 library(surveydown)
11 ````
12
13 ::: {.sd_page id=welcome}
14
15 # 🦸 Welcome to the Ultimate Superhero Survey! 🦸♀️
16
17 Thank you for participating in our research on superhero preferences and
18 powers! This survey will help us understand what makes superheroes
19 appealing to different people.
20
21 **This survey should take about 3-5 minutes to complete.**
22
23 <br>
24 ```${r}```
25 sd_question(
26   type = "mc",
27   id   = "has_fav_hero",
28   label = "Do you have a favorite super hero?",
29   option = c("Yes" = "yes", "No" = "no")
30 )

```

surveydown Studio Build Preview Responses

127.0.0.1

🔄 🖥️ 📱 📄 ☁️

🧑 Welcome to the Ultimate Superhero Survey! 🧑

Thank you for participating in our research on superhero preferences and powers! This survey will help us understand what makes superheroes appealing to different people.

This survey should take about 3-5 minutes to complete.

Do you have a favorite super hero? *

Yes
 No

Who is your favorite super hero?

Next



Database Connection [Settings](#)

Connected (GSSAPI enabled)

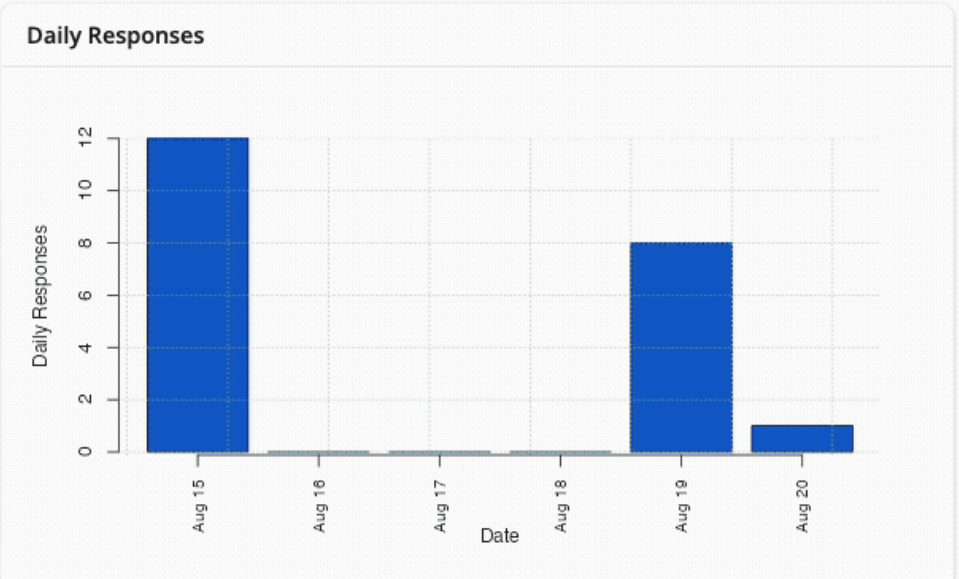
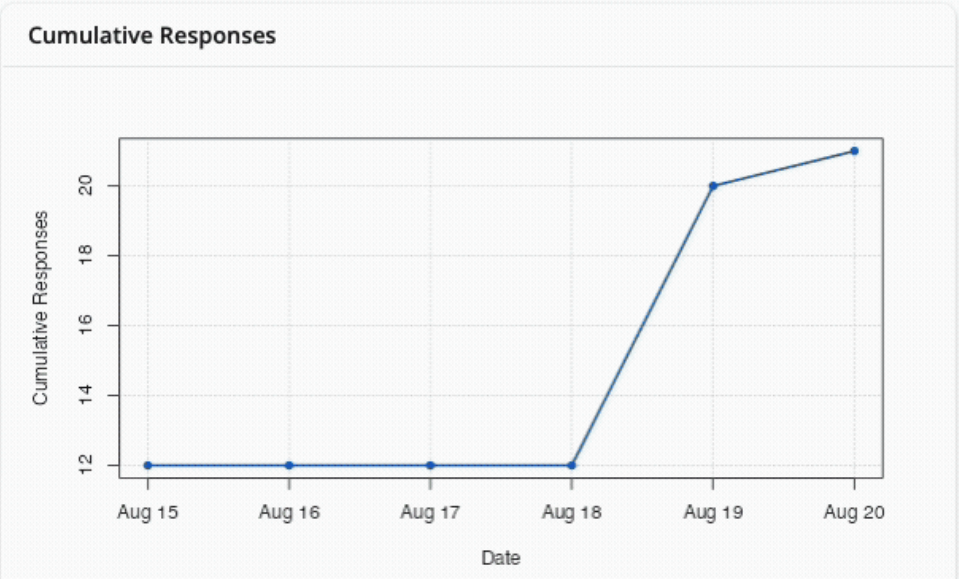
Choose a table to view:

superheros

Total Responses
21

Daily Average
4.2

Completion Rate
85.7%



**With great power comes great
responsibility.**

Ways to help:

github.com/surveydown-dev/surveydown/

- Try it out!
- Give it a 🌟
- Post an issue
- Join the GitHub discussion
- Contribute a template



Meet the team!



John Helveston, Ph.D.



Pingfan Hu



Bogdan Bunea

surveydown.org

