

surveydown

An Open-Source, Markdown-Based Platform
for Reproducible and Programmable Surveys

Pingfan Hu

George Washington University

Quant UX Con 2025



About Me



- **Pingfan Hu**, PhD Candidate at George Washington University, advised by Dr John Helveston.
- Research field:
 1. Sustainable transportation
 2. Human behavior and decision-making
- Research focuses:
 1. Open-source software development
 2. Data science and choice modeling
- For more information, visit pingfanhu.com

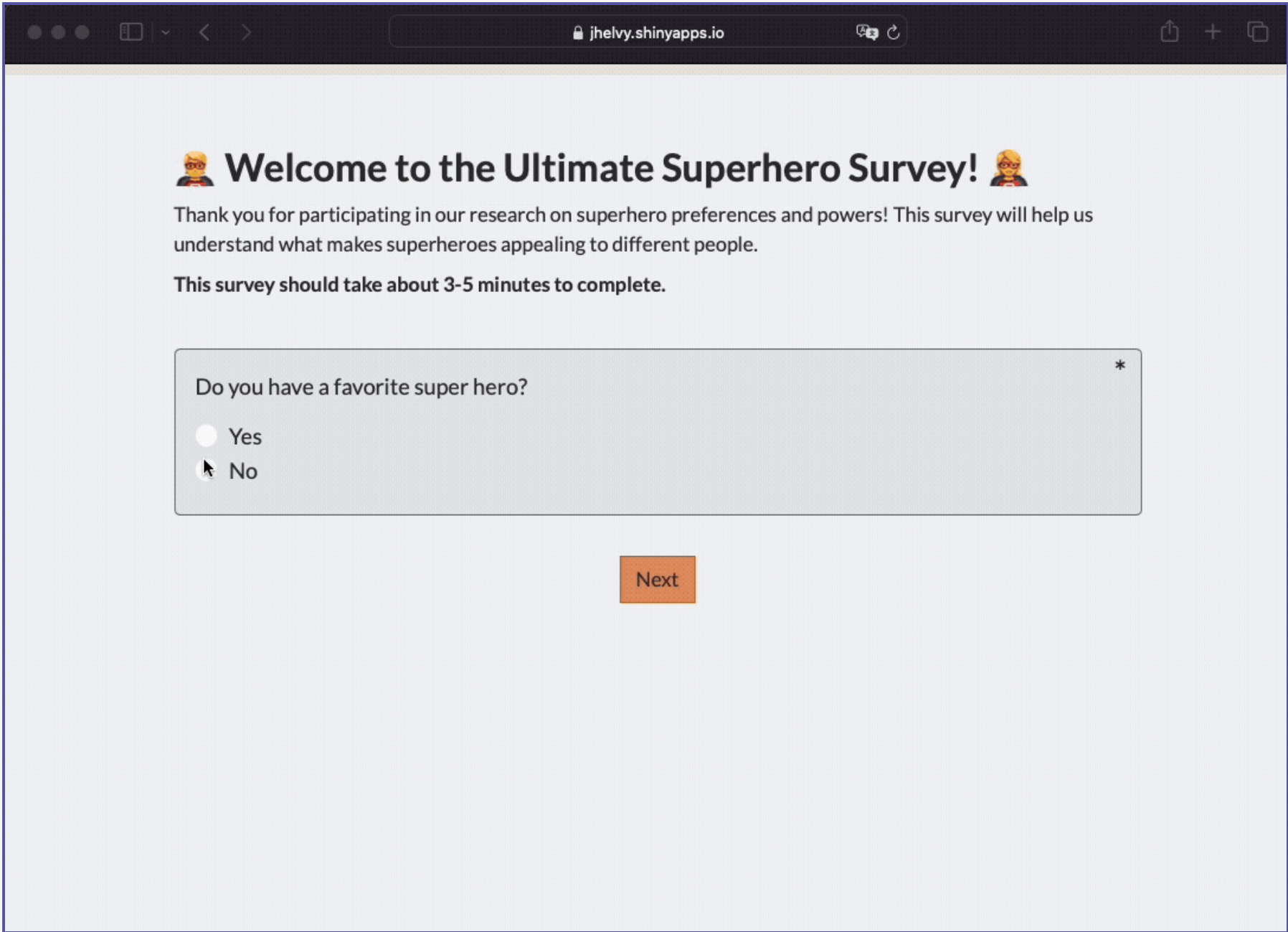
I try to figure out what people want...





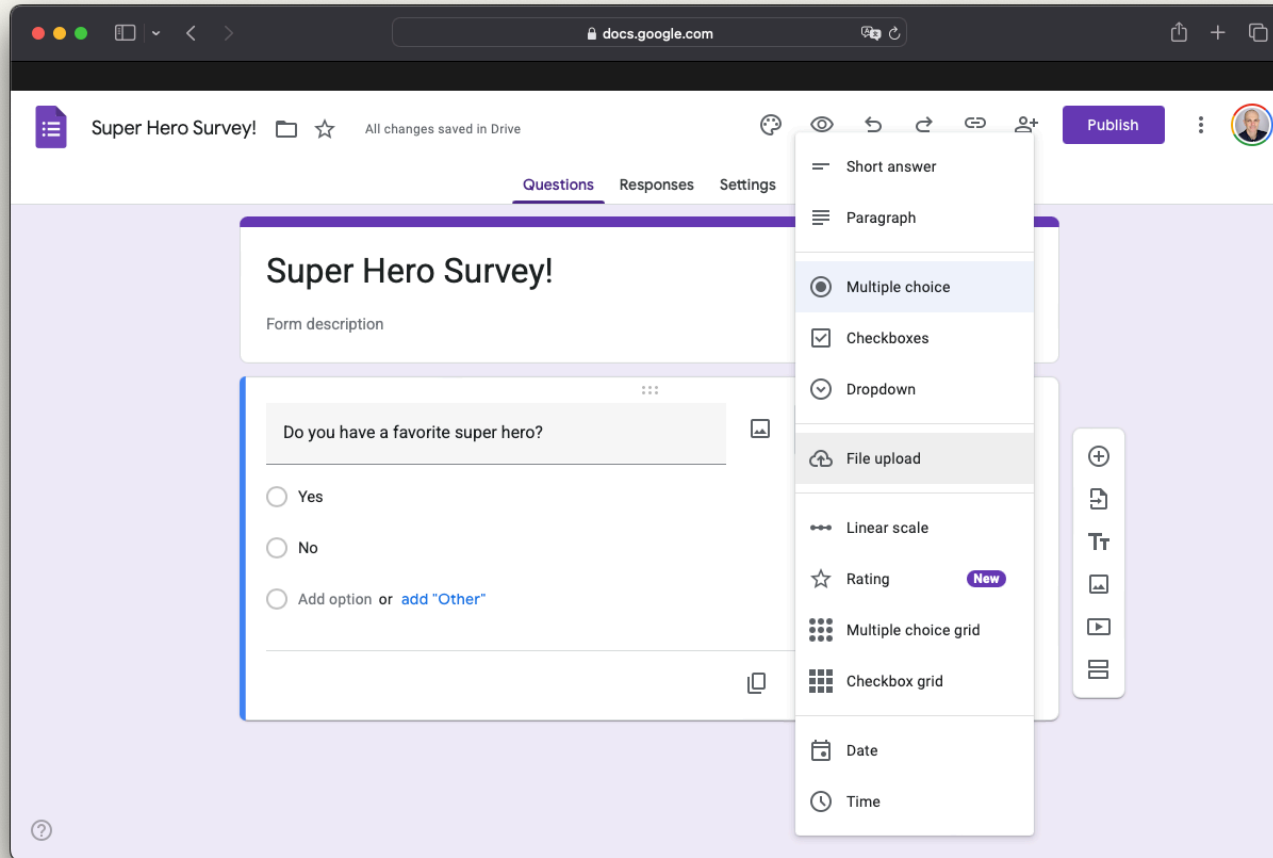
Prof. John
Helveston





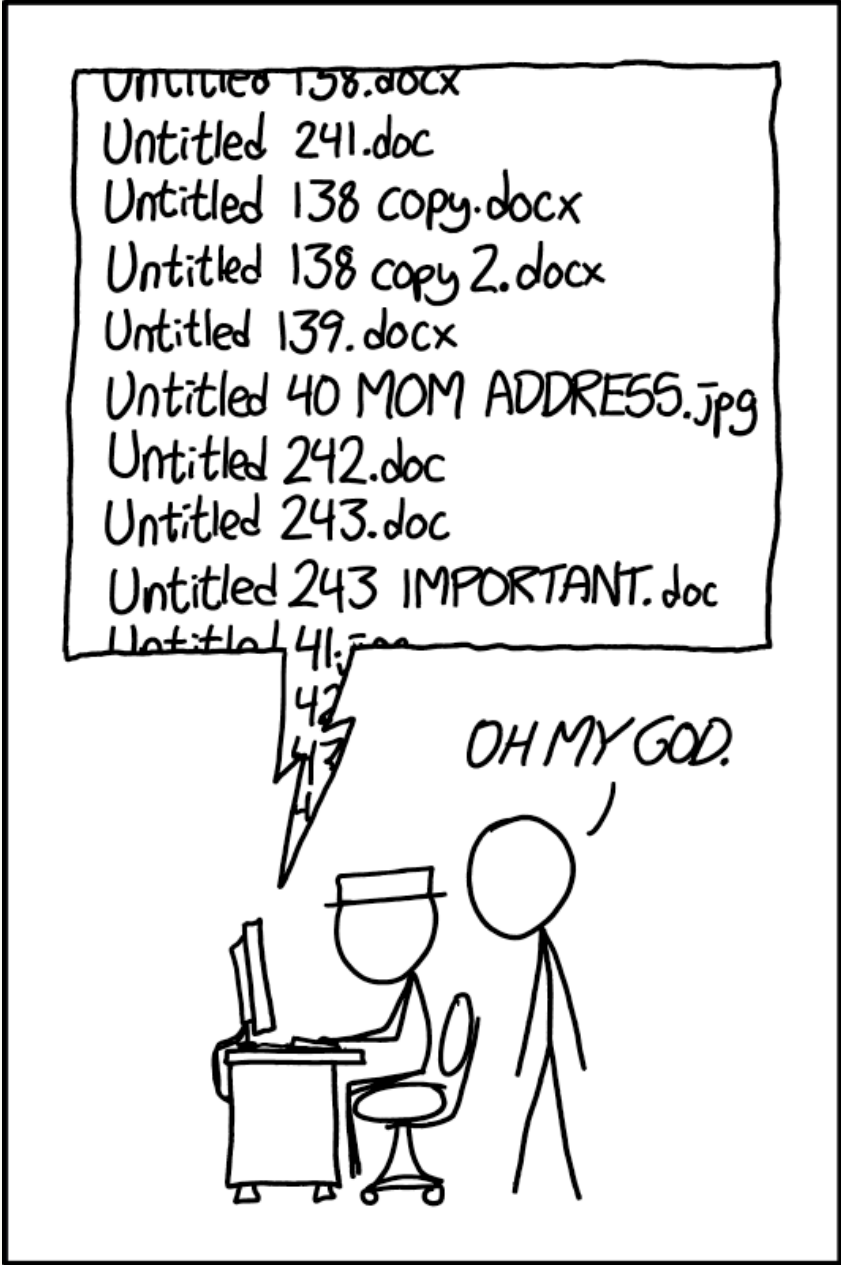
WYSIWYG Interface

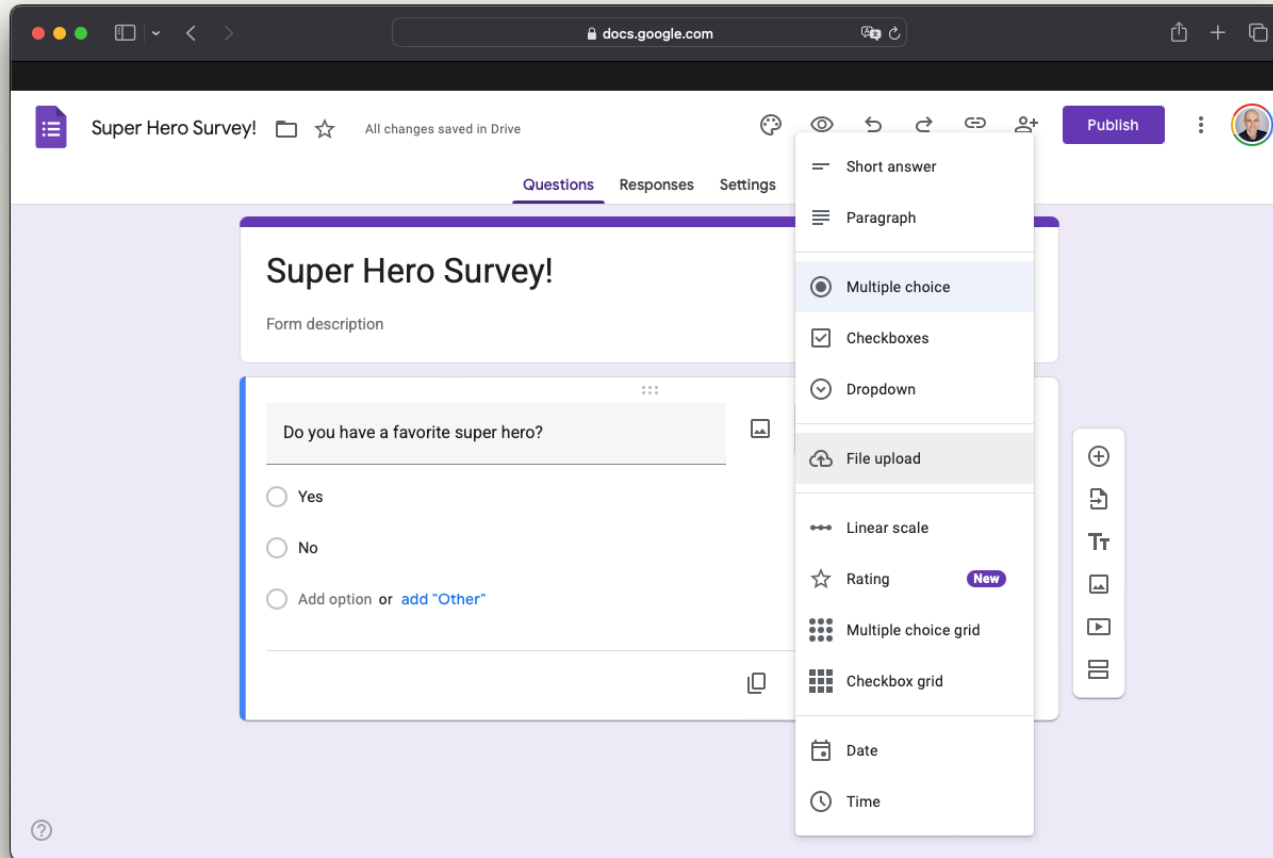
The image shows a browser window displaying a Google Docs document titled "Super Hero Survey!". The document is in "Questions" mode, showing a survey form with a question: "Do you have a favorite super hero?". The question has three radio button options: "Yes", "No", and "Add option or add 'Other'". A menu is open over the question, listing various question types: Short answer, Paragraph, Multiple choice (selected), Checkboxes, Dropdown, File upload, Linear scale, Rating (marked as "New"), Multiple choice grid, Checkbox grid, Date, and Time. The interface includes a top navigation bar with "Questions", "Responses", and "Settings" tabs, a "Publish" button, and a user profile icon. The browser address bar shows "docs.google.com".



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?

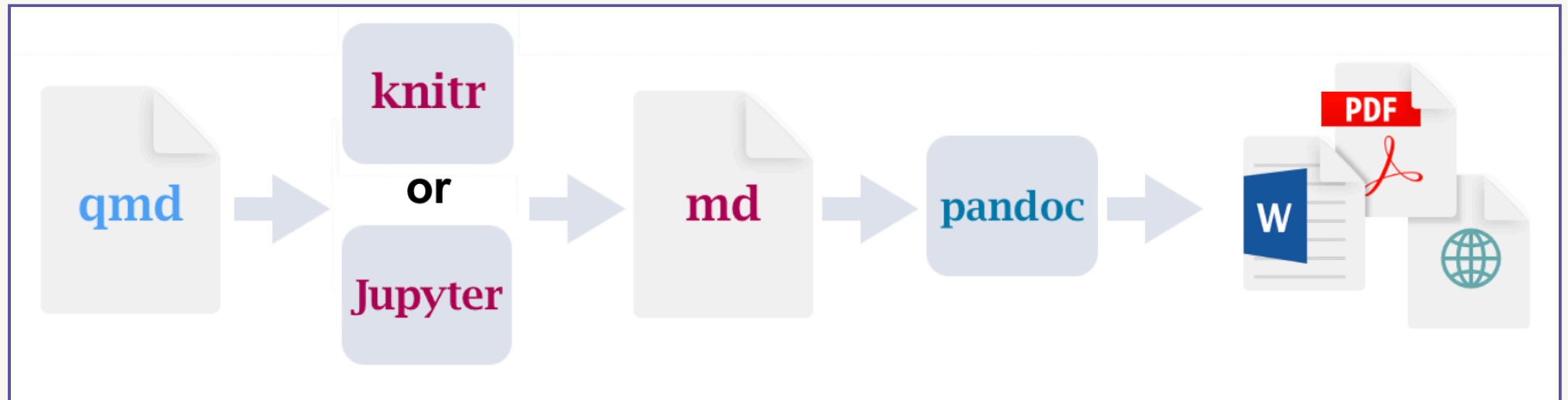
What is **surveydown**?



R package that renders Quarto files into surveys



Quarto is a publishing system

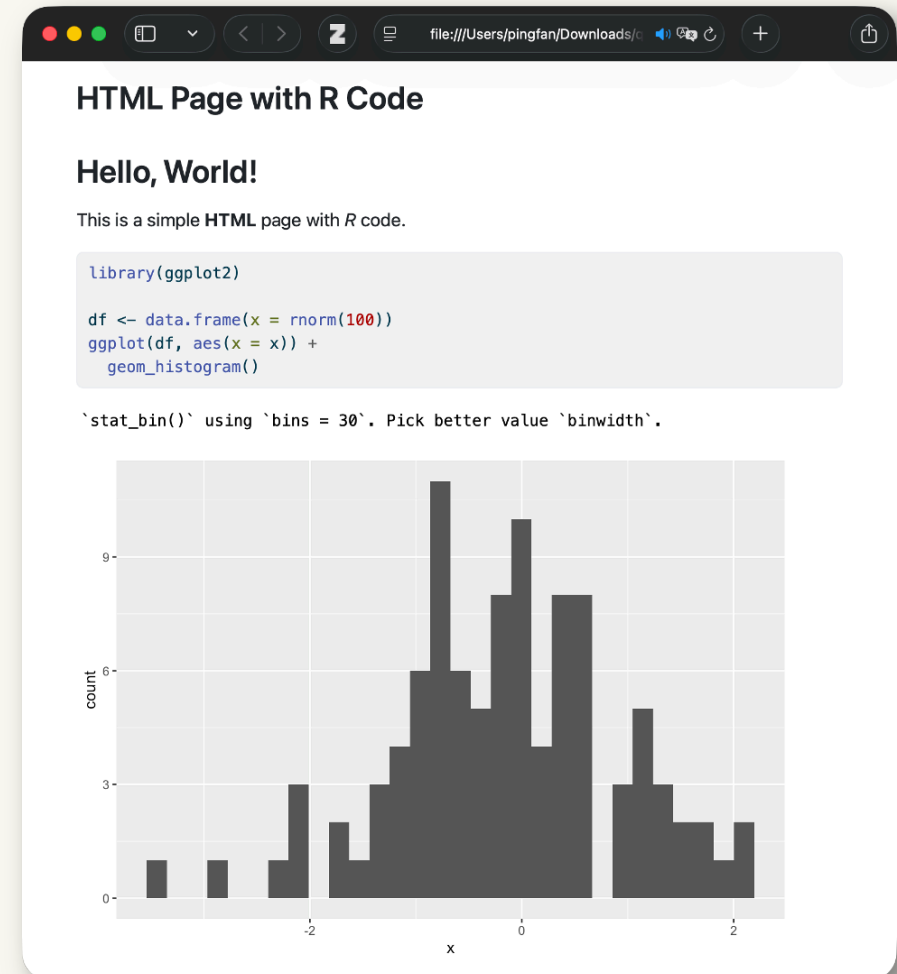


Original qmd file

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 ```
```

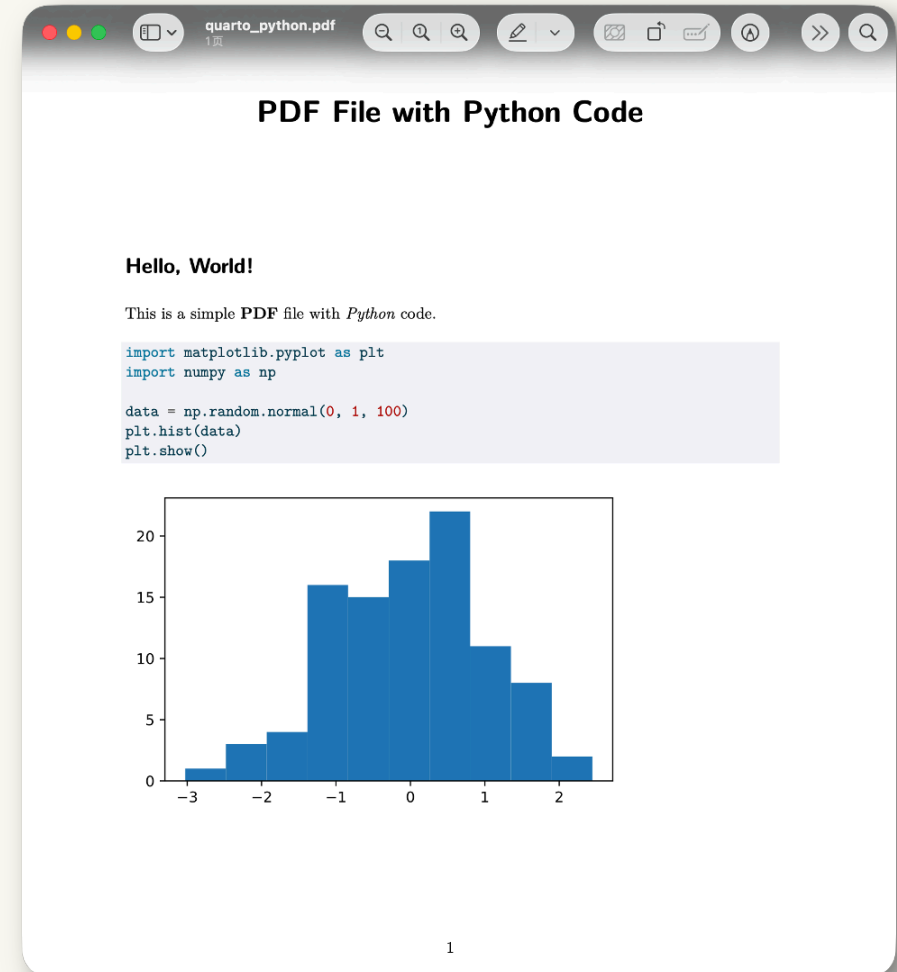


Original qmd file

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 ```
```

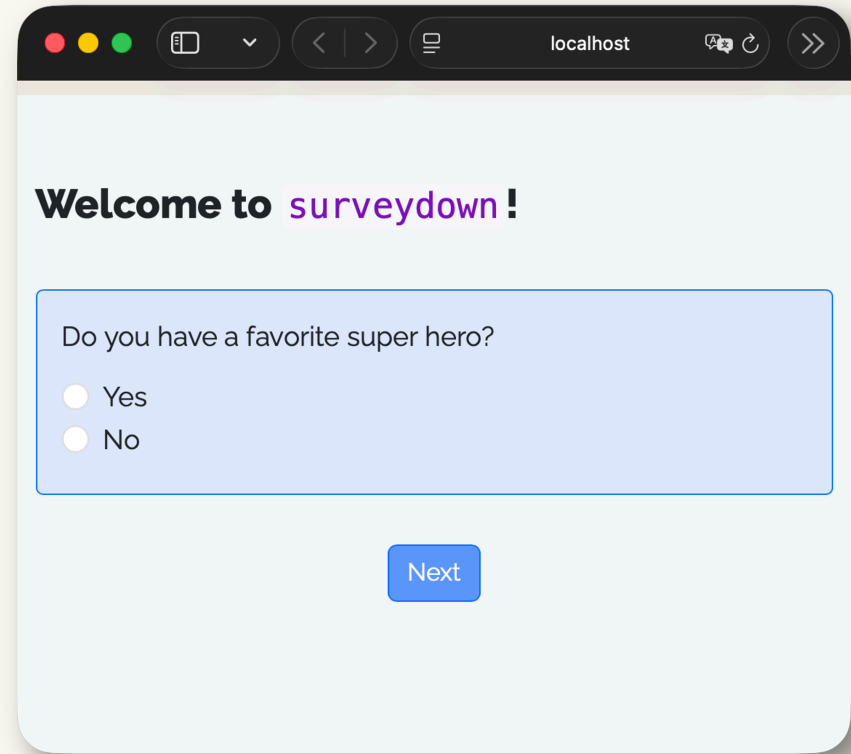




+



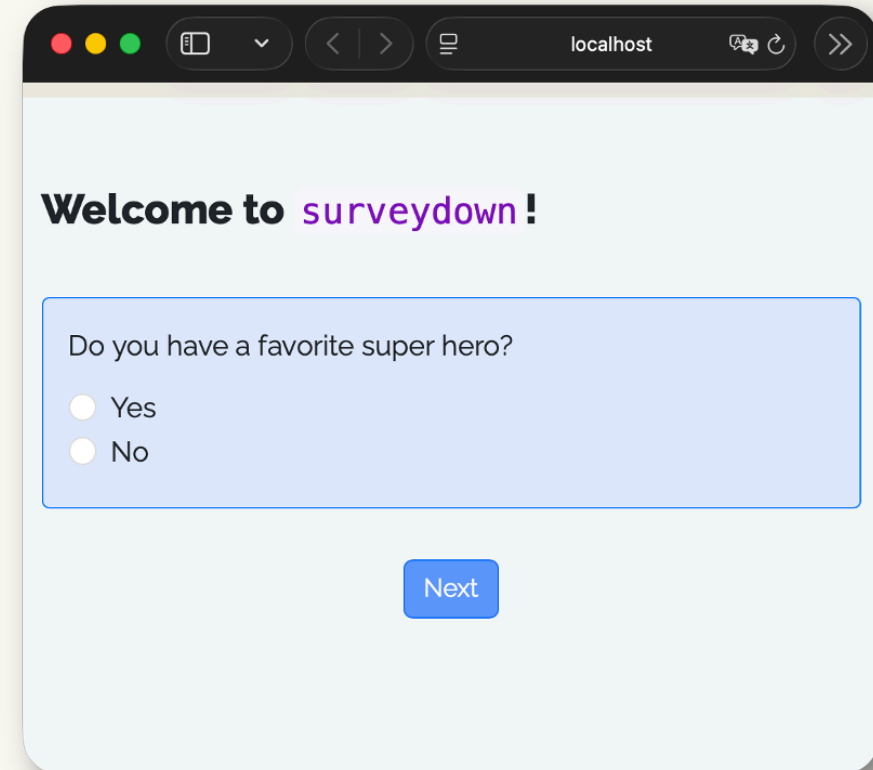
=



survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 --- welcome
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 --- some_other_page
30
31 Other content...
```

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
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 --- some_other_page
30
31 Other content...
```

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
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 --- some_other_page
30
31 Other content...
```

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
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 --- some_other_page
30
31 Other content...
```

Use triple-dash marker (---) to define survey pages

Quarto fences (:::) also OK:

```
::: {#welcome .sd-page}
```

Page content

```
:::
```

survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 --- welcome
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 --- some_other_page
30
31 Other content...
```

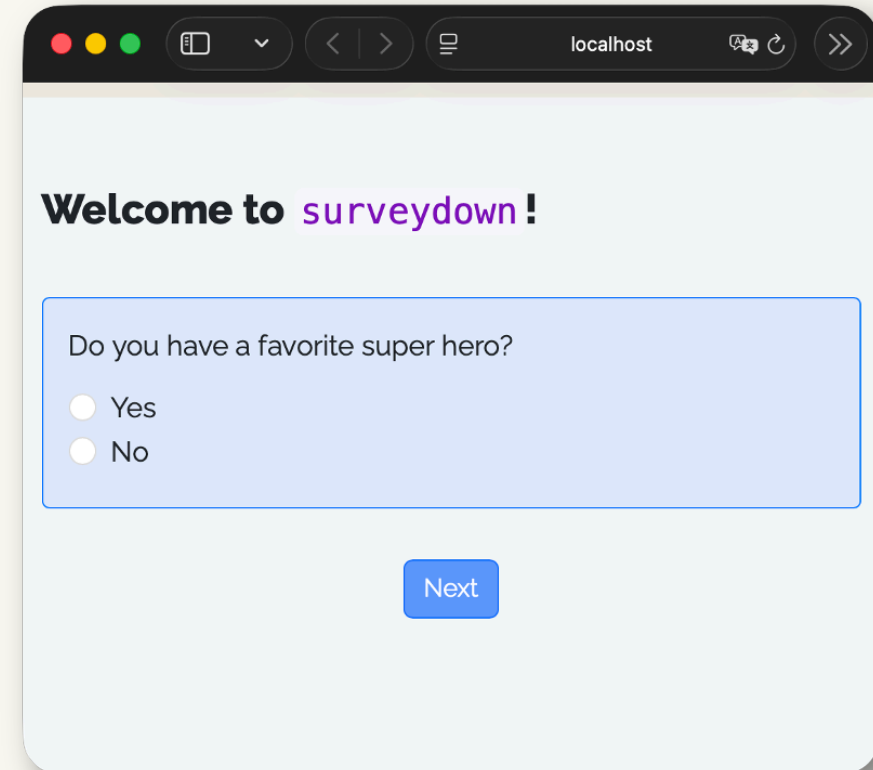
Page content

- 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
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 --- some_other_page
30
31 Other content...
```

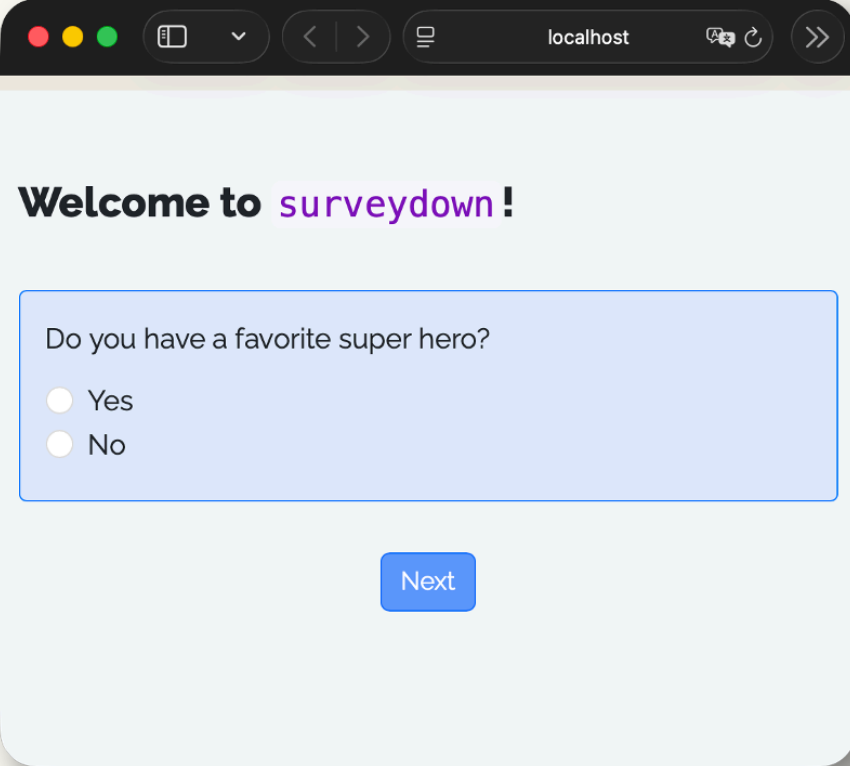
Rendered Survey



survey.qmd

```
1 ---
2 format: html
3 echo: false
4 warning: false
5 ---
6
7 ```{r}
8 library(surveydown)
9 ```
10
11 --- welcome
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 --- some_other_page
30
31 Other content...
```

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!

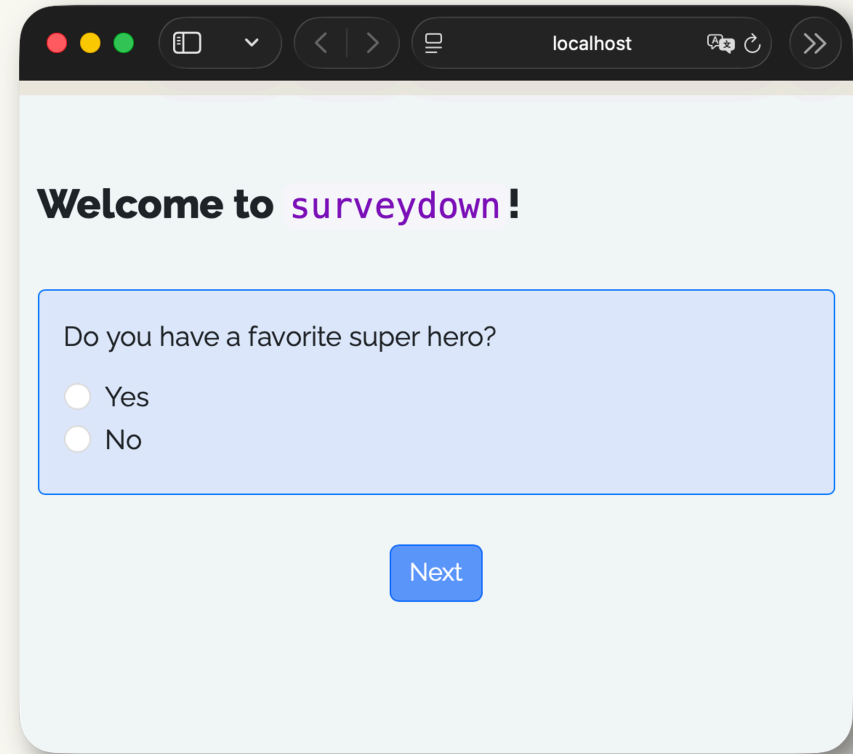




+



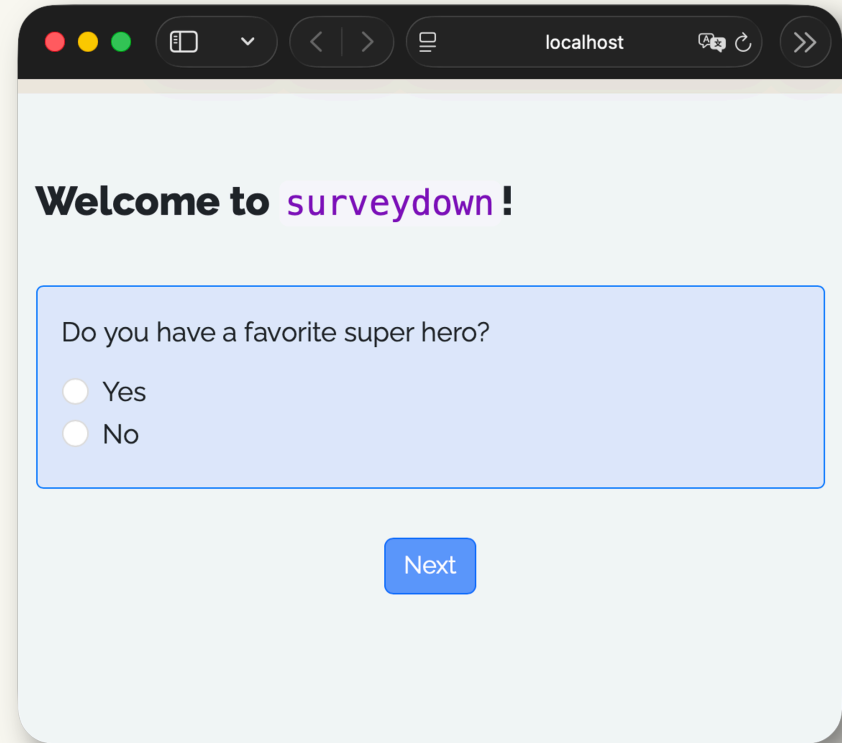
=



Shiny App



UI

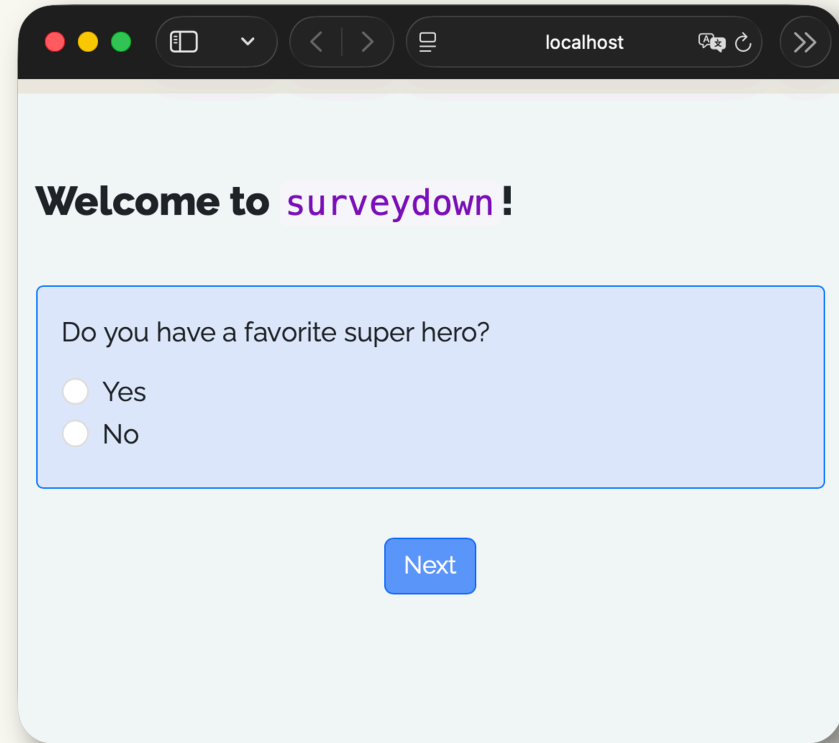


Shiny App

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

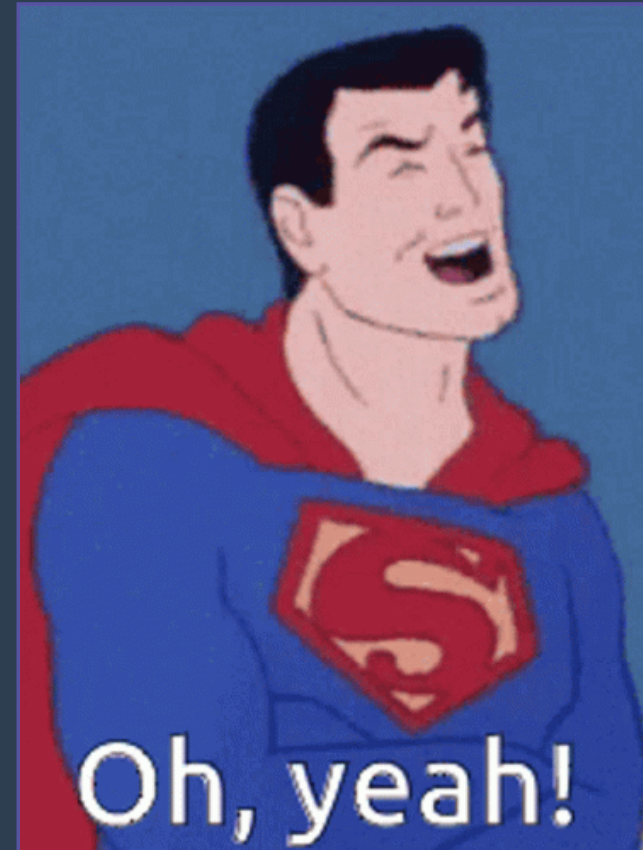
Run the `surveydown` server

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 left sidebar shows a list of tables under the 'public' schema, with 'superheros' selected. The main area shows the 'superheros' table with the following columns: 'session_id' (text), 'has_fav_hero' (text), 'fav_hero_name' (text), and 'hero_universe' (text). The table contains 20 rows of data. The bottom of the interface shows pagination controls: 'Page 1 of 1', '100 rows', and '20 records'. There are also 'Refresh', 'Data', and 'Definition' buttons.

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

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

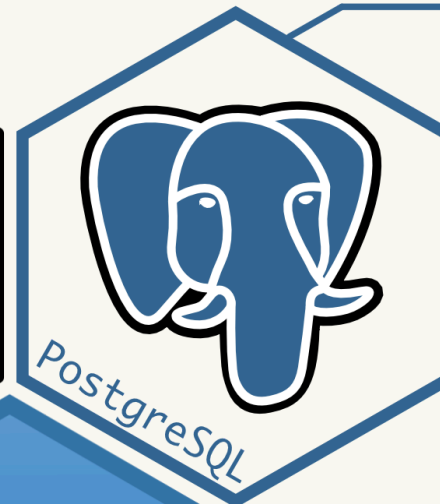
Console Terminal Background Jobs
R 4.4.1 · ~/gh/slides/2025-posit-conf-surveydown/demo/
> db <- sd_db_connect()
✓ Successfully connected to the database.
>
> data <- sd_get_data(db = db)
>
> glimpse(data)
Rows: 20
Columns: 50
$ session_id <chr> "5cf0f43d847425..."
$ time_start <chr> "2025-08-15 15:..."
$ 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

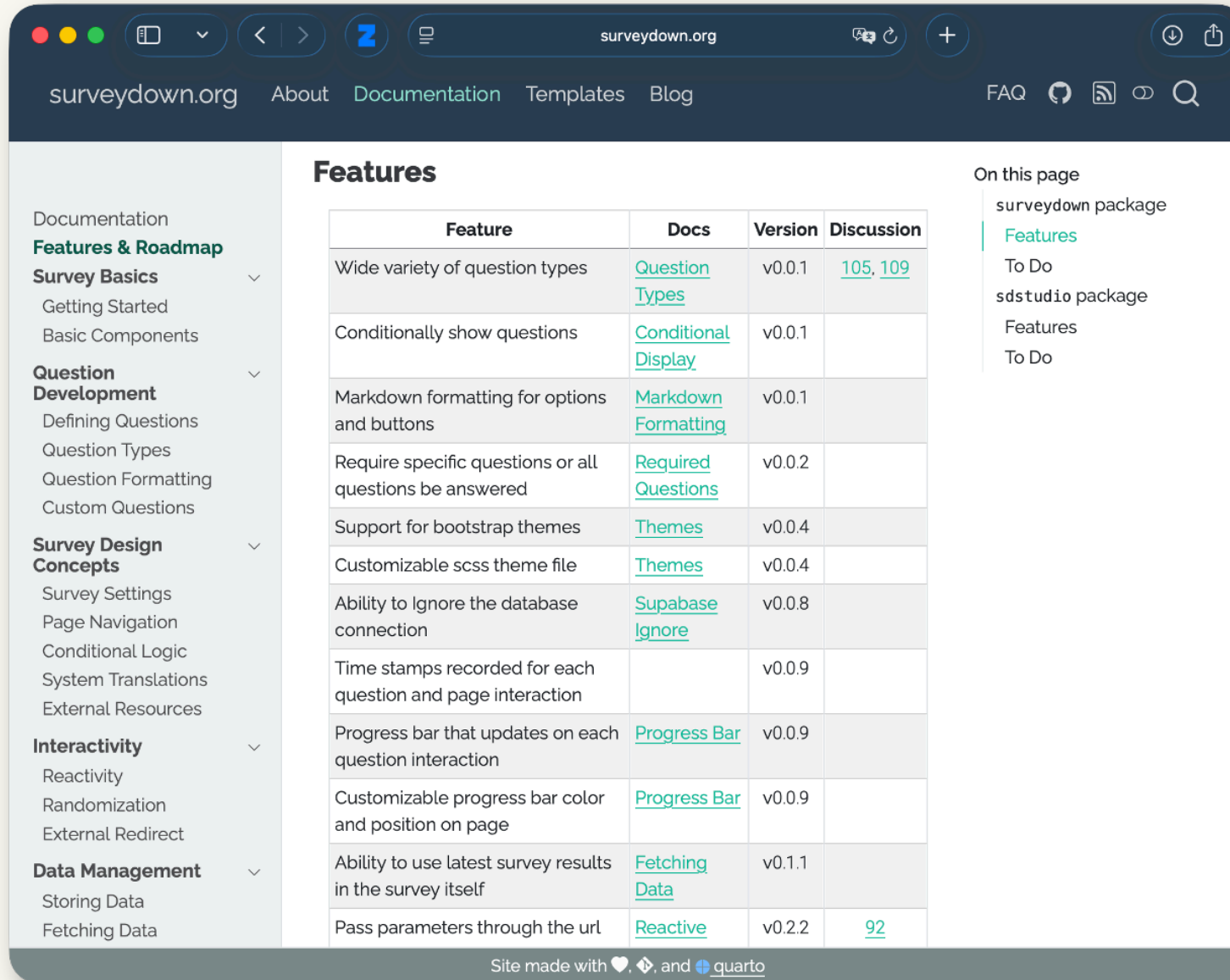


Survey Design

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 four columns: Feature, Docs, Version, and Discussion. The table lists various features such as "Wide variety of question types", "Conditionally show questions", "Markdown formatting for options and buttons", etc. The website also has a navigation menu on the left and a "On this page" section on the right.

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

On this page

- surveydown package
 - [Features](#)
 - To Do
- sdstudio package
 - Features
 - To Do

Site made with , , and  quarto

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

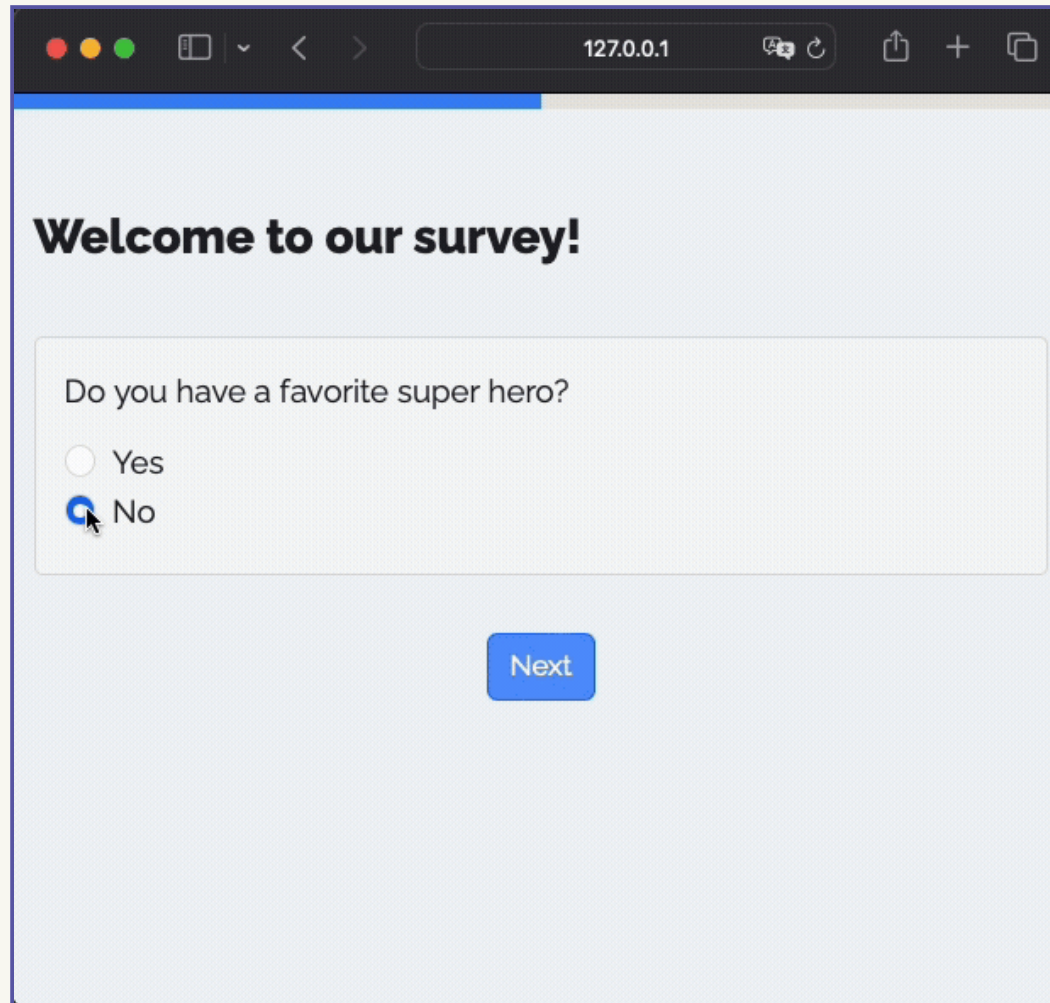
Conditional logic

Conditional showing

Conditional skipping

Conditional stopping

Conditional showing - `sd_show_if()`



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

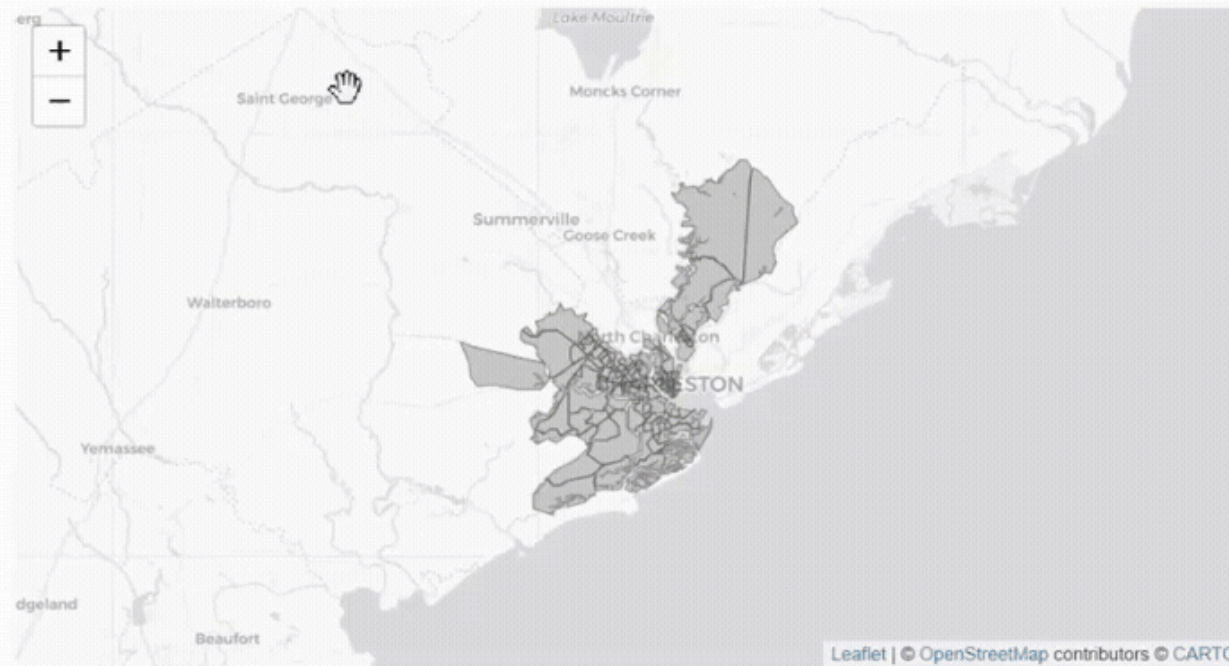
“If {condition}, then show {target}”

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.

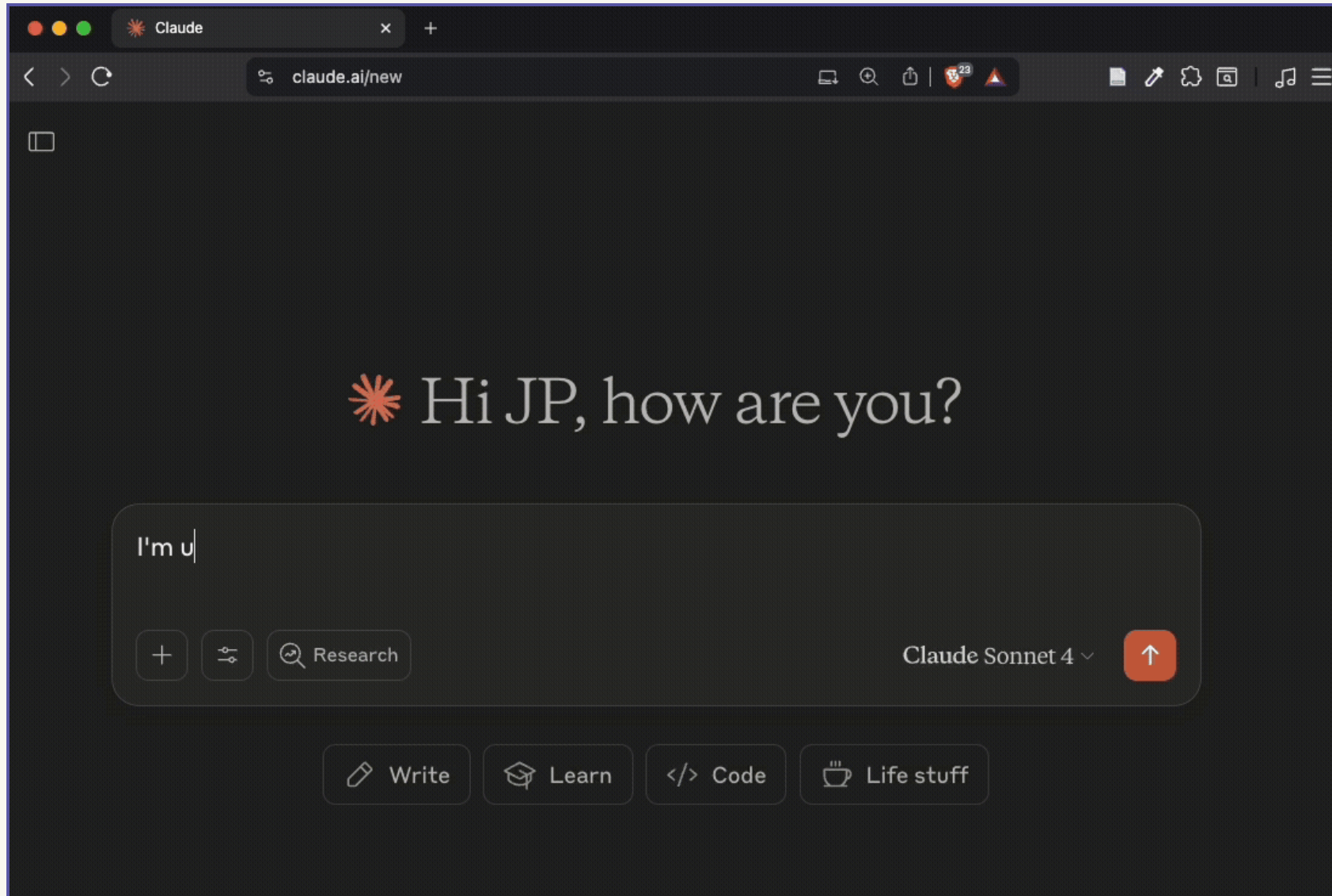


Next Question



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

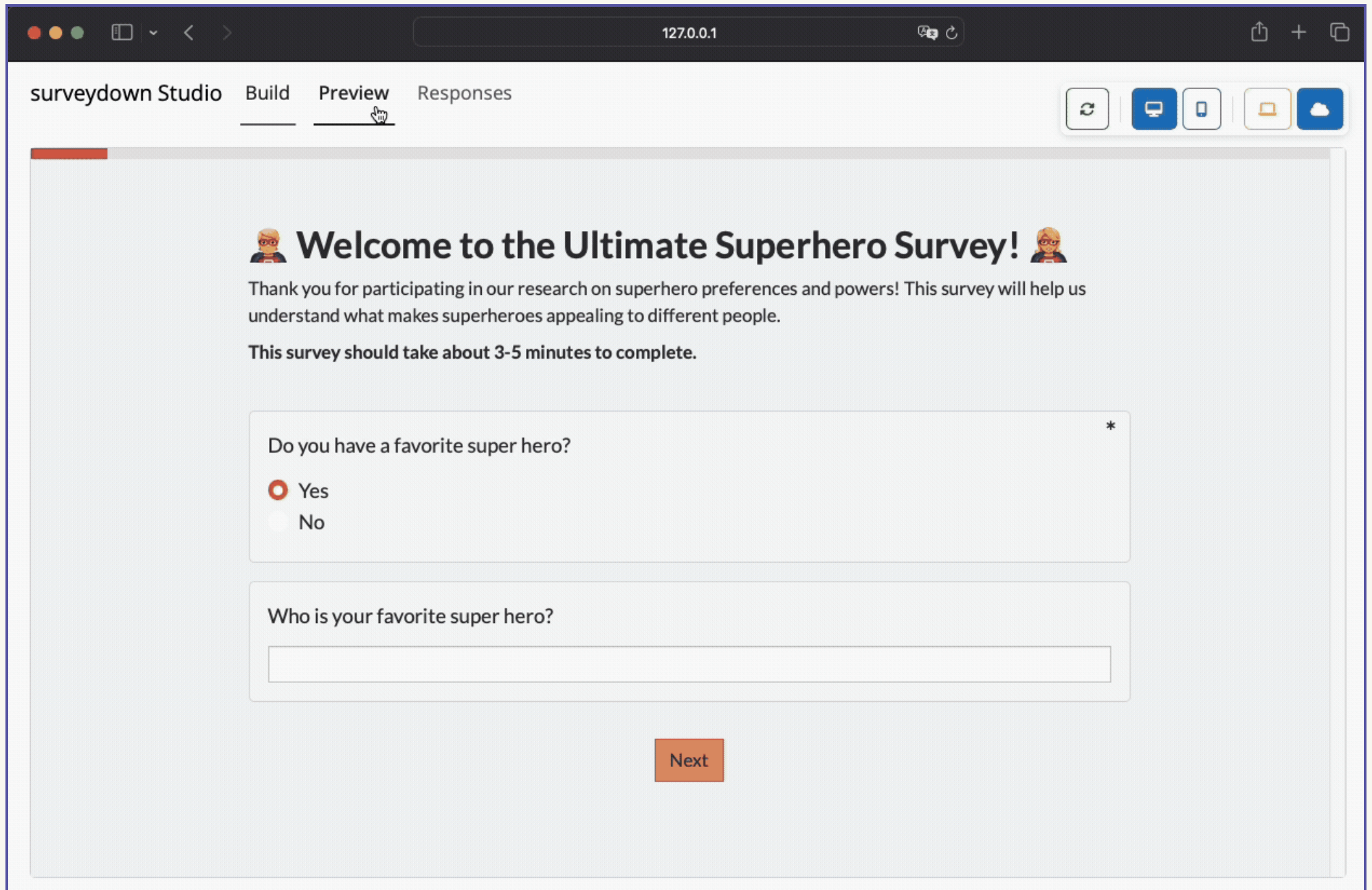
- Page: welcome
 - # 🦸 Welcome to the...
 - has_fav_hero | mc
Do you have a favorite super hero?
 - fav_hero_name | text
Who is your favorite super hero?
- Page: hero_details
 - # Tell us about your...
 - hero_universe | mc
Which superhero universe do you prefer?
 - hero_qualities | mc_multiple
What 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 )

```





Database Connection [Settings](#)

Connected (GSSAPI enabled)

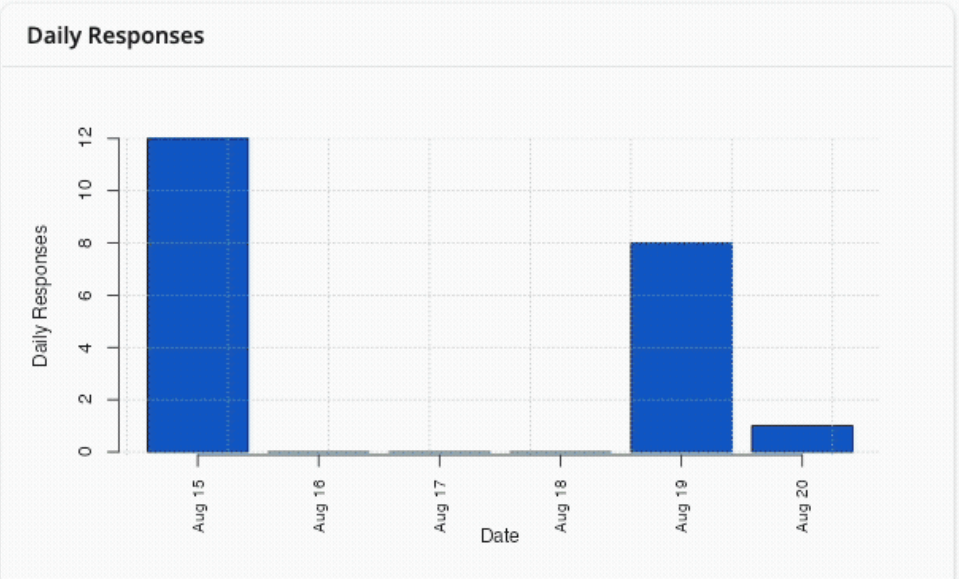
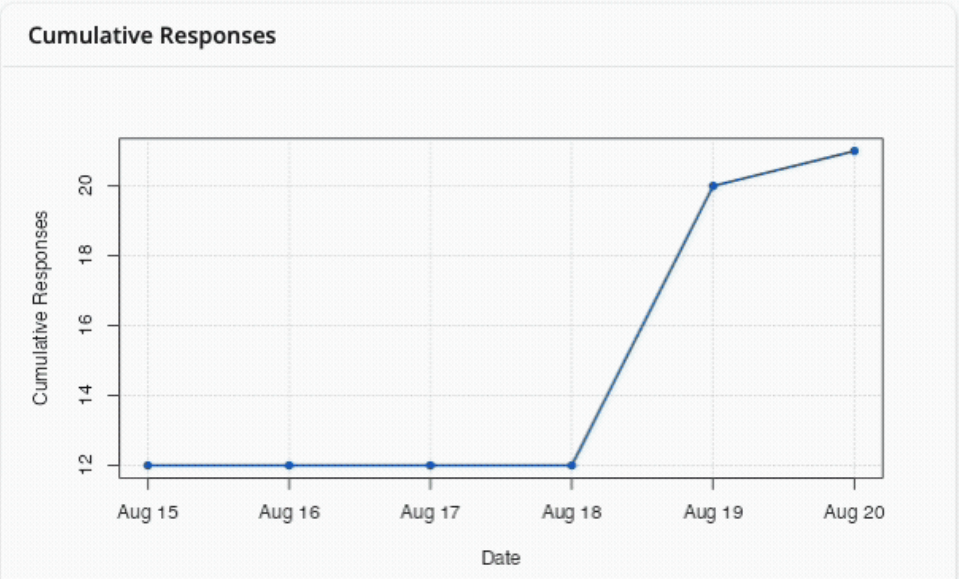
Choose a table to view:

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!

surveydown.org



John Helveston, Ph.D.



Pingfan Hu



Bogdan Bunea



One more thing...

Workshop by Dr John Helveston Tomorrow

jhelvy.github.io/2025-qux-surveydown-workshop/

Thursday Nov 6, 2:00 PM UTC – 5, Eastern Time (U.S.)