

# **Data Science, AI, and Machine Learning in Public Health using R**

## **Part 3**

December 2025

Presented By: Wronski Associates

# Working in Posit Cloud

## Tasks:

- Create a posit.cloud account
- Install packages for other code (installs.R).
- Set an Anthropic API key (provided by instructor)
- Generate R code in Claude (math.R).
- Run the generated code (math.R) in posit.cloud

# Create an account

 posit™ Cloud

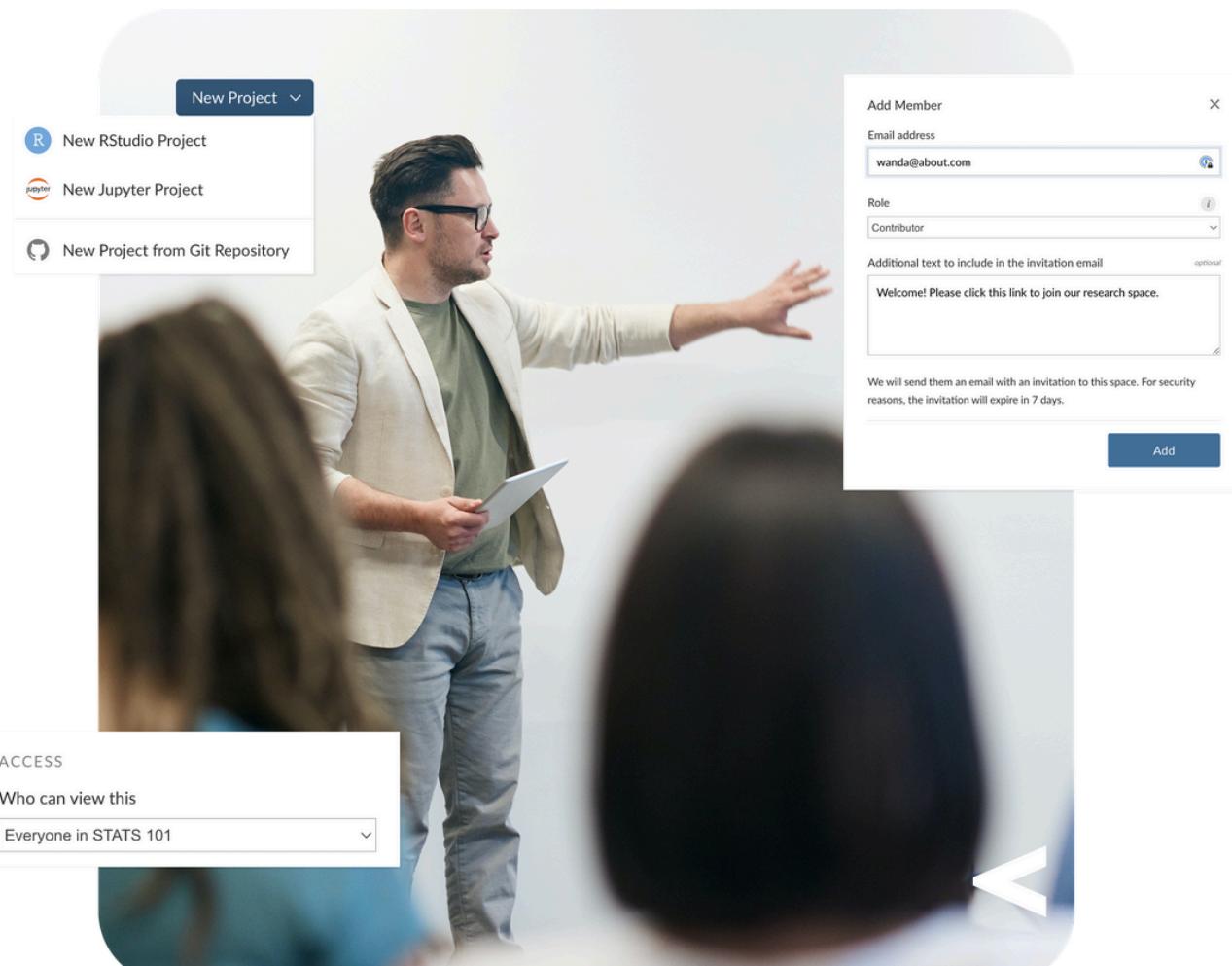
Log In   Sign Up

# Friction free data science

Posit Cloud lets you access Posit's powerful set of data science tools right in your browser – no installation or complex configuration required.

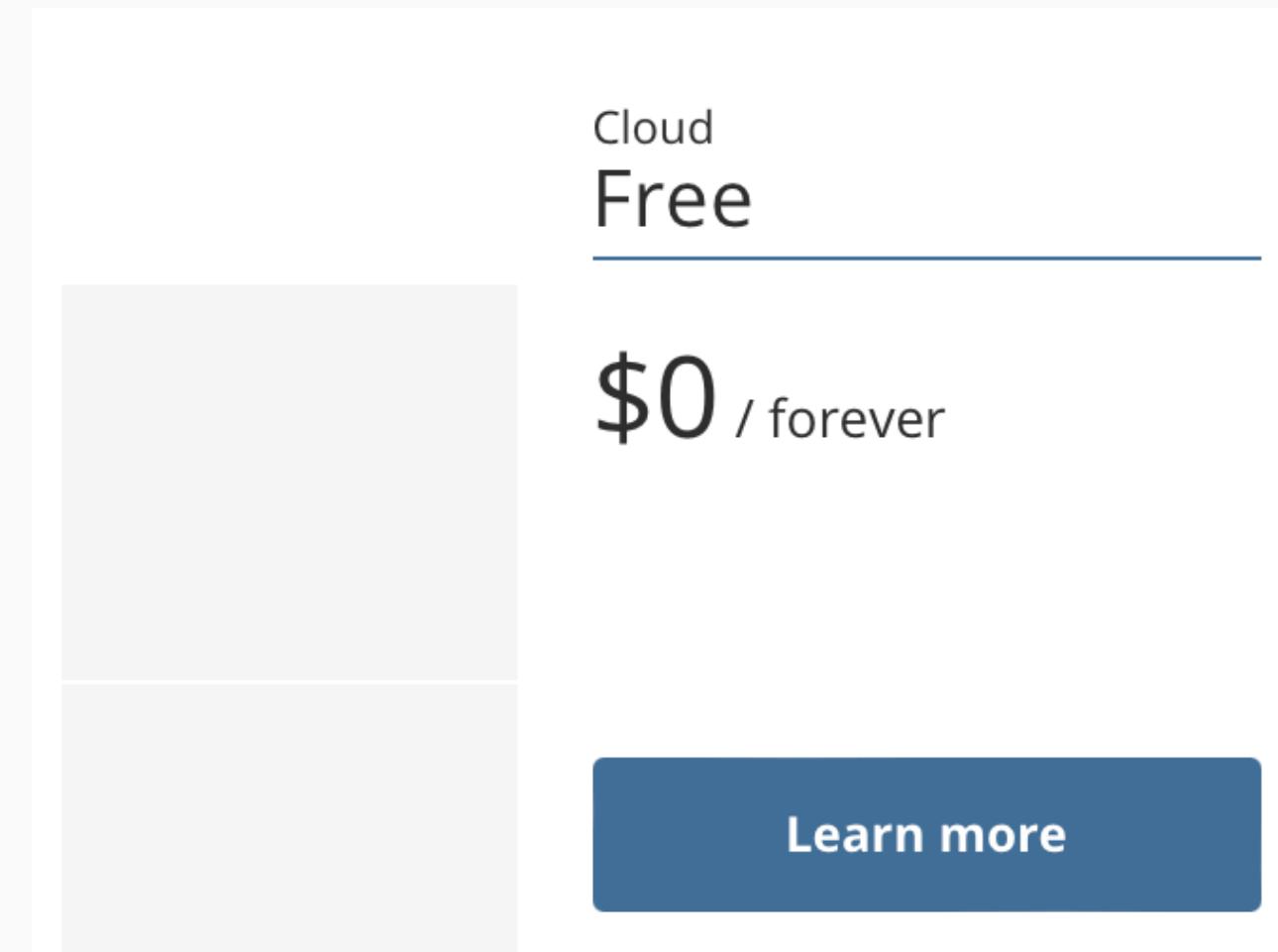
[GET STARTED](#)   [ALREADY A USER? LOG IN](#)

If you already have a shinyapps.io account, you can log in using your existing credentials.



The composite image features a man in a light-colored blazer and glasses, gesturing while speaking to an audience. In the foreground, a large image of the Posit Cloud interface is displayed. The interface includes a 'New Project' dropdown menu with options like 'New RStudio Project', 'New Jupyter Project', and 'New Project from Git Repository'. To the right, a modal window titled 'Add Member' shows fields for 'Email address' (wanda@about.com), 'Role' (Contributor), and 'Additional text to include in the invitation email' (Welcome! Please click this link to join our research space). A note at the bottom states: 'We will send them an email with an invitation to this space. For security reasons, the invitation will expire in 7 days.' A blue 'Add' button is at the bottom right of the modal.

## Select the Free option



## Enter account information

### Sign Up for Cloud Free

\$0 / forever

Questions? [Contact Us.](#)

If you make limited, occasional use of Posit Cloud, have access to an organization account, or just want to explore Cloud to see if it's right for you, our Cloud Free plan is all you need.

[Sign Up](#)

# Verify email

## Verify Your Email

We sent a link to verify your email address to

Please go to your email and click  
that link to verify that we have your correct email  
address - then return to this page and press  
Continue.

Continue

Wrong email address? [Update your email](#)

Didn't get the email? You can [resend the link](#), but  
you should also make sure our email didn't end up in  
your spam folder.

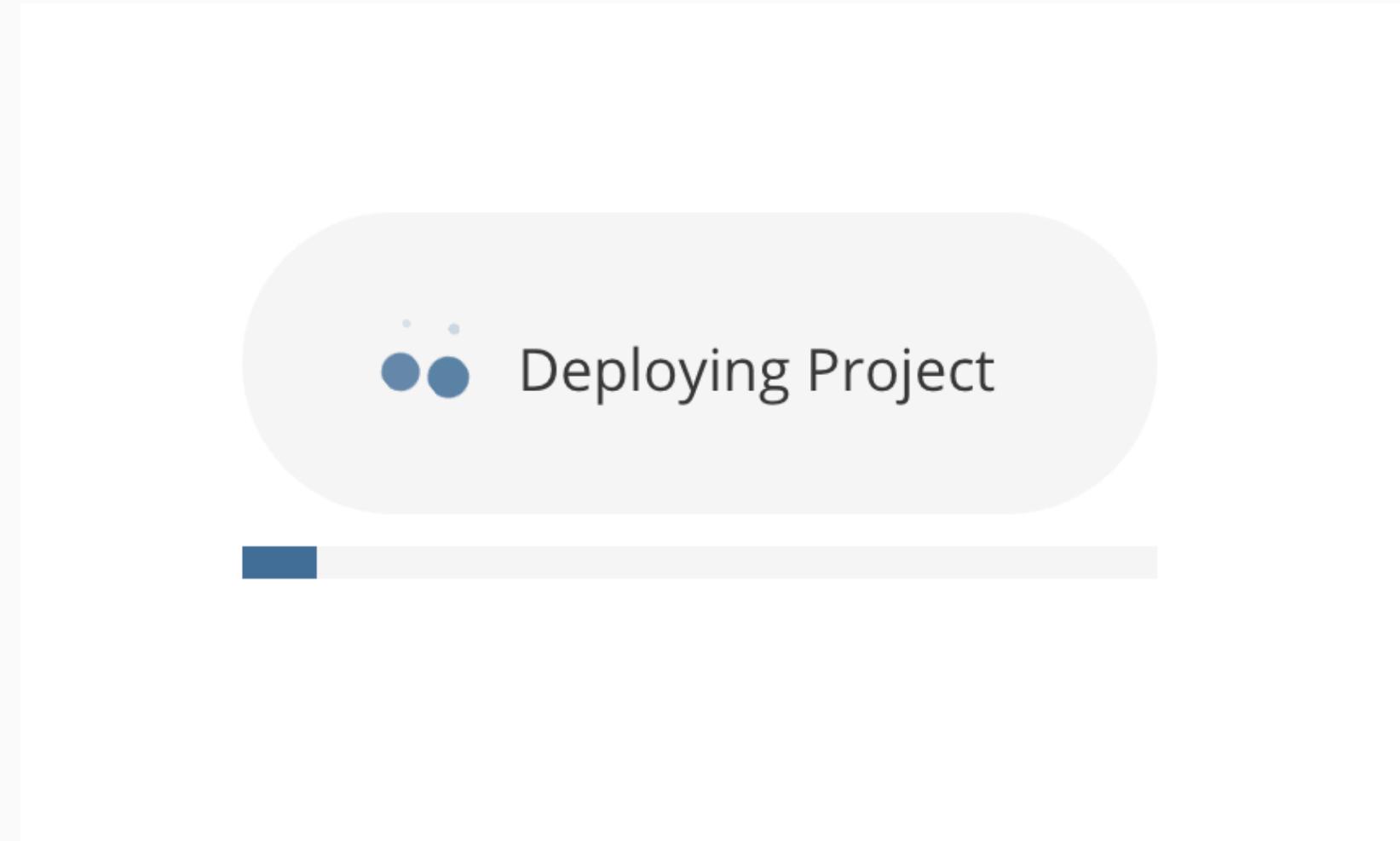
# Posit.cloud workspace

The screenshot shows the Posit.cloud workspace interface. The browser title bar reads "Your Content - Your Workspace". The address bar shows the URL "posit.cloud/content/yours?sort=name\_asc". A blue banner at the top states: "The ability to publish applications and documents to Posit Cloud is now removed for all users. Please visit [Posit Connect Cloud](#) to support your deployment needs." The main navigation menu includes "Your Workspace", "Content", "Usage", and "About". On the left, a sidebar titled "Spaces" lists "Your Workspace" and "+ New Space". Below that are sections for "Learn" (Guide, What's New, Recipes, Cheatsheets), "Help" (Current System Status, Posit Community), and "Info" (Plans & Pricing, Terms and Conditions). The central content area is titled "Your Content (0)" and displays a message: "no content". It includes filters for "ACCESS" and "SORT". The footer features the "posit Cloud" logo and links for "Terms" and "Status". Social media icons for Facebook, LinkedIn, Instagram, and GitHub are also present.

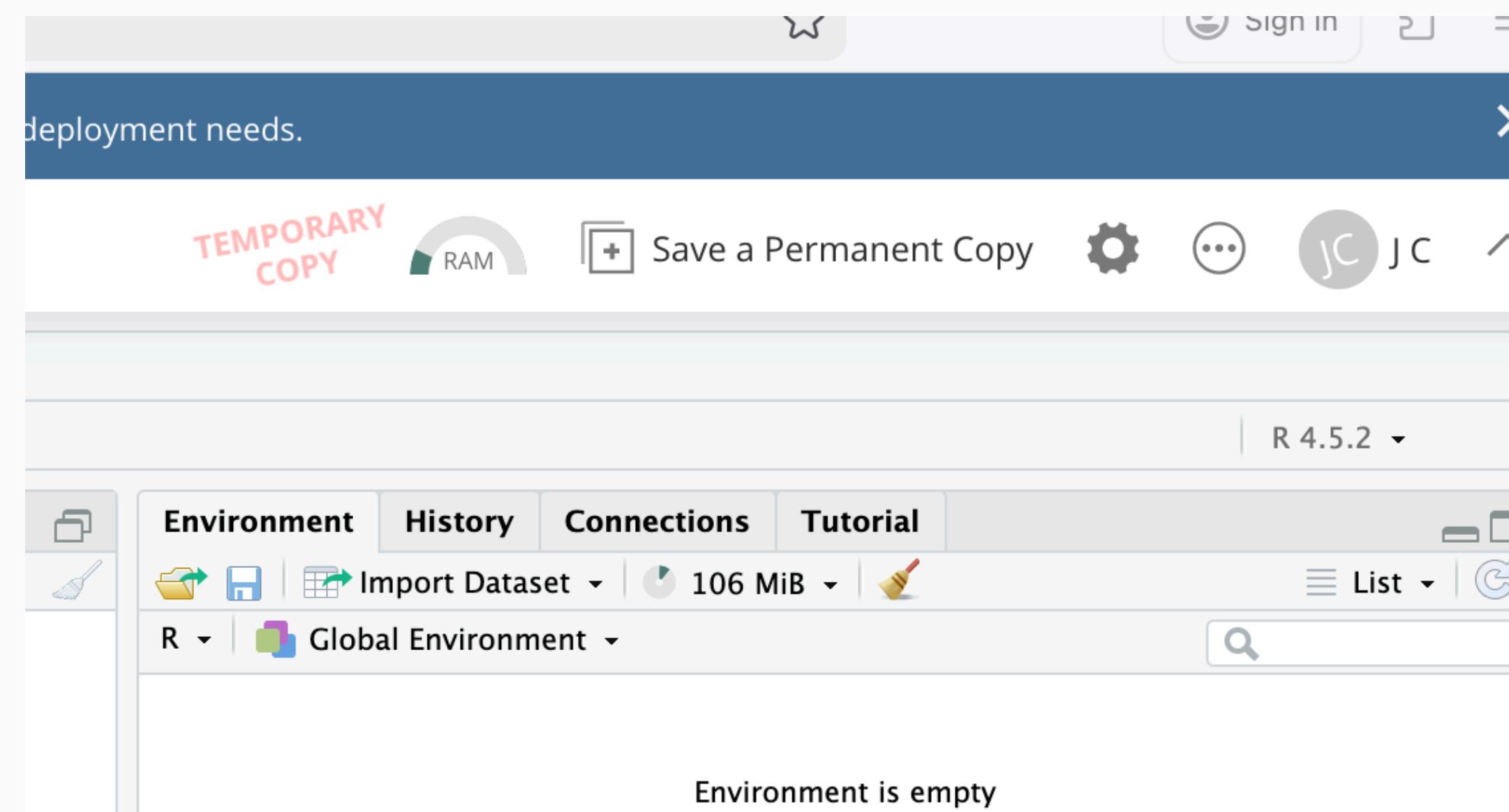
## Copy the instructor project

While logged in to your account, paste this link into a url: <https://posit.cloud/content/11582736>

# Copy in progress



# Save as a permanent copy



# Assets

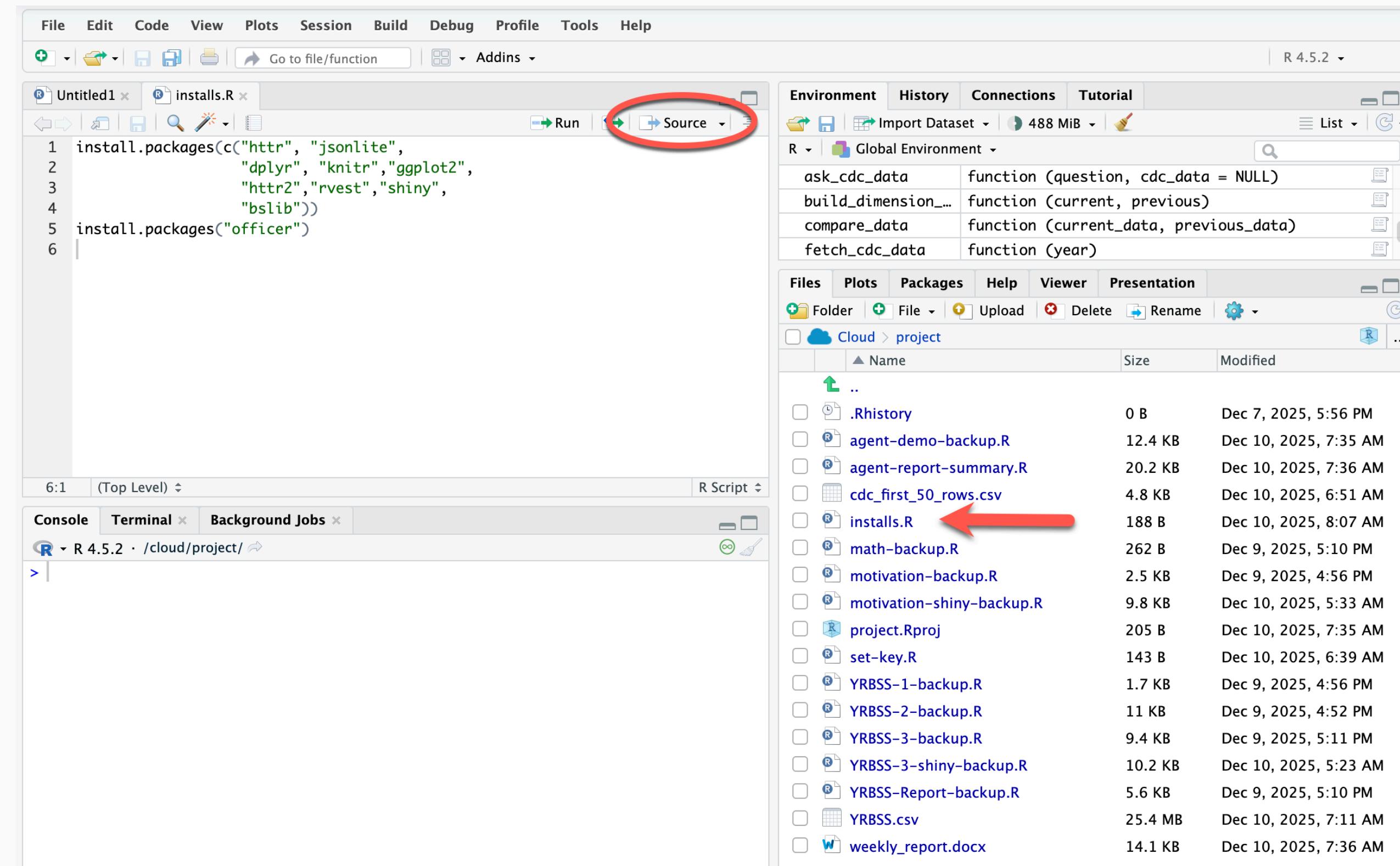
The screenshot shows the RStudio interface with a red box highlighting the 'Files' tab of the Cloud project browser.

**Cloud Project Browser (Files Tab):**

Name	Size	Modified
..		
.Rhistory	0 B	Dec 7, 2025, 5:56 PM
agent-demo-backup.R	12.4 KB	Dec 10, 2025, 7:35 AM
agent-report-summary.R	20.2 KB	Dec 10, 2025, 7:36 AM
cdc_first_50_rows.csv	4.8 KB	Dec 10, 2025, 6:51 AM
installs.R	188 B	Dec 10, 2025, 6:39 AM
math-backup.R	262 B	Dec 9, 2025, 5:10 PM
motivation-backup.R	2.5 KB	Dec 9, 2025, 4:56 PM
motivation-shiny-backup.R	9.8 KB	Dec 10, 2025, 5:33 AM
project.Rproj	205 B	Dec 10, 2025, 7:35 AM
set-key.R	143 B	Dec 10, 2025, 6:39 AM
YRBSS-1-backup.R	1.7 KB	Dec 9, 2025, 4:56 PM
YRBSS-2-backup.R	11 KB	Dec 9, 2025, 4:52 PM
YRBSS-3-backup.R	9.4 KB	Dec 9, 2025, 5:11 PM
YRBSS-3-shiny-backup.R	10.2 KB	Dec 10, 2025, 5:23 AM
YRBSS-Report-backup.R	5.6 KB	Dec 9, 2025, 5:10 PM
YRBSS.csv	25.4 MB	Dec 10, 2025, 7:11 AM
weekly_report.docx	14.1 KB	Dec 10, 2025, 7:36 AM

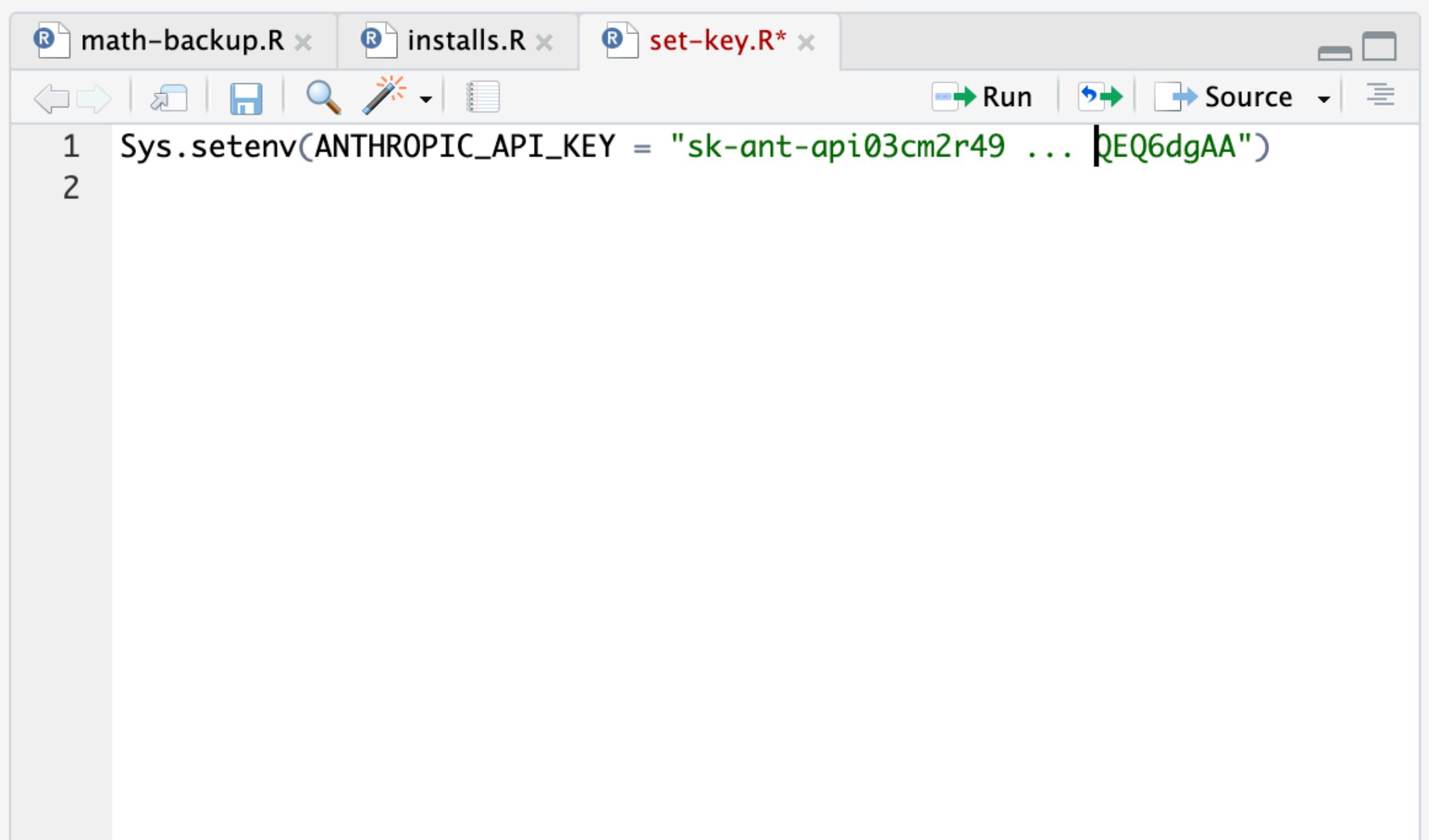
# While we are here

- In the Files section, click on **installs.R**
- This opens the install code.
- Press **Source** to run the installs. Packages need to be installed in your environment before they can be used.



# Set the Anthropic API key

- In the Files section, click on **set-key.R**
- This opens the set-key code.
- Put your Anthropic API key in between the double-quotes
  - This key needs to be in place in order to use Anthropic's (Claude) LLMs.
- Press **Source** to set the key.



```
1 Sys.setenv(ANTHROPIC_API_KEY = "sk-ant-api03cm2r49...QEQ6dgAA")
```

# Code from Claude

*Prompt: Generate R code that allows you to enter 2 numbers that will be multiplied together. The results should be displayed in the console.*

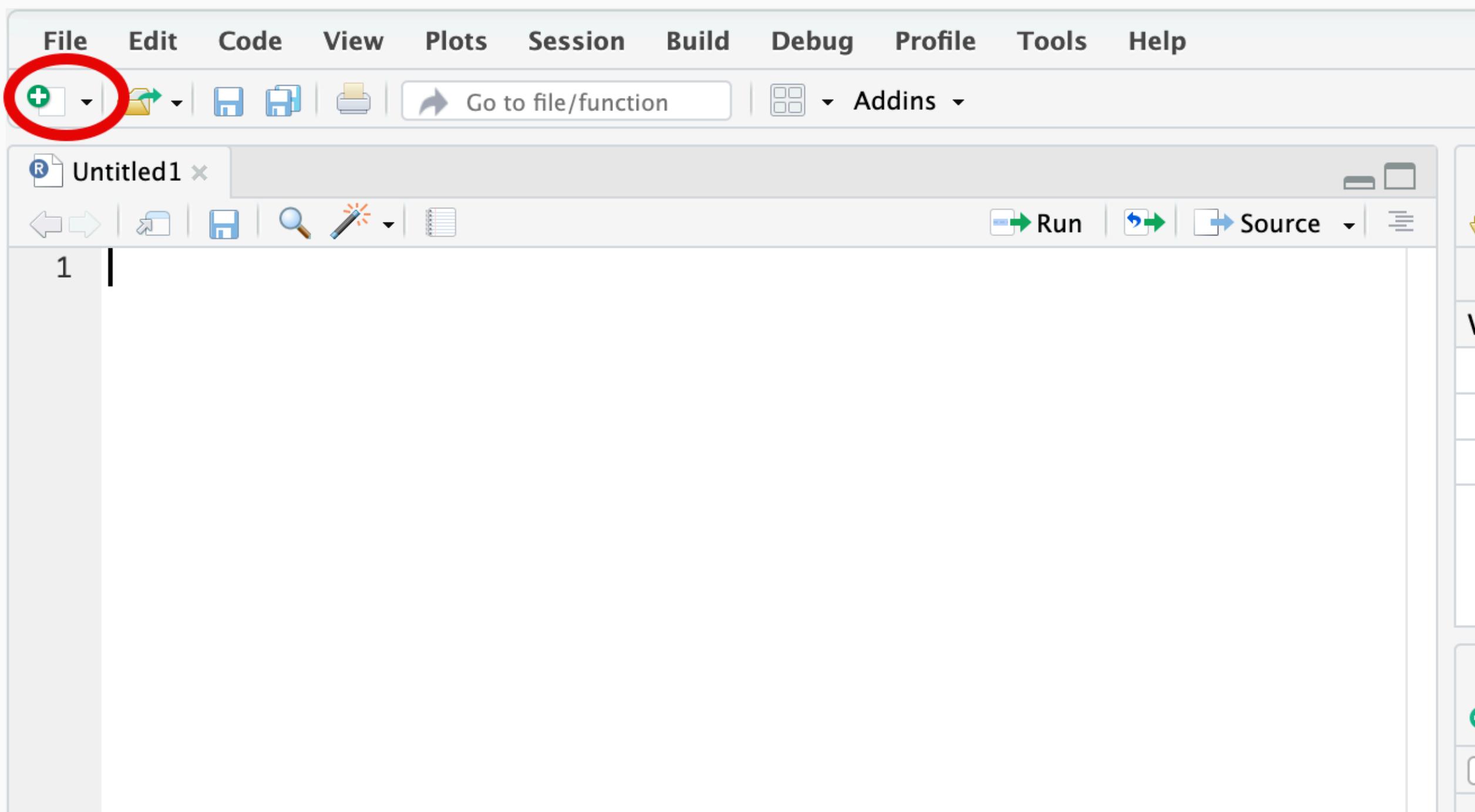
```
r

# Get two numbers from user input
num1 <- as.numeric(readline(prompt = "Enter first number: "))
num2 <- as.numeric(readline(prompt = "Enter second number: "))

# Multiply and display result
result <- num1 * num2
cat("Result:", num1, "*", num2, "=", result, "\n")
```

# Create a new R script

- Copy the R code generated by Claude.
- In posit.cloud, select **R Script**. It is the first icon with a plus sign.
- Paste Claude code into posit.cloud
- File → Save As **Math**.
- Press **Source**



# Enter values in the console

- Enter the values in the **Console**
- Review the result.

The screenshot shows the RStudio interface with the following components:

- File Bar:** File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help.
- Toolbar:** Go to file/function, Addins.
- Script Editor:** Untitled1, installs.R, math-backup.R. The math-backup.R code is:

```
1 # Get two numbers from user input
2 num1 <- as.numeric(readline(prompt = "Enter first number: "))
3 num2 <- as.numeric(readline(prompt = "Enter second number: "))
4
5 # Multiply and display result
6 result <- num1 * num2
7 cat("Result:", num1, "*", num2, "=", result, "\n")
```

- Environment Browser:** Shows objects like records\_with\_data (1508L), records\_without\_... (3492L), required\_packages (chr [1:5] "httr2" "jsonlite" "dplyr" "tidyverse" "grid"), and result (15).
- File Browser:** Cloud > project, listing files such as .Rhistory, installs.R, math-backup.R, motivation-backup.R, etc.
- Console:** The bottom-left pane, highlighted with a red border, shows the R session output:

```
> source("/cloud/project/math-backup.R")
> Enter first number: 3
> Enter second number: 5
> Result: 3 * 5 = 15
> |
```

# Get CDC Data

## Purpose

- Practice getting Claude to do what we want.

- Primary prompt
- Refining results
- 'Troubleshooting'
  - Claude thinks it can't get to the data
  - Limitations of the API

- Understand a little about R in the Anthropic environment

Note: We will create 2 reports. YRBSS-1 (individual rows) and YRBSS-2 (summary). Both reports use AI for creating the R code. Neither use AI as part of the code.

# CDC Data

The image shows the homepage of the CDC Data website. At the top, there's a blue header bar with the CDC logo and the text "Centers for Disease Control and Prevention". Below the header is a navigation bar with links for "Home", "Health Topics", "Outbreaks", "About CDC", and a "Sign In" button. A search bar is also present. The main content area features a large banner with a photograph of two people in wheelchairs in a park setting. The banner has the title "Disability Status and Types Data" and a descriptive text: "Data on disability status and six functional disability types are available for each state, the District of Columbia, and select territories. Data are also available for the US overall and by HHS region." Below the banner is a grid of nine boxes, each representing a different CDC program or surveillance system. The boxes are arranged in three rows of three. The top row contains "NATIONAL CENTER FOR HEALTH STATISTICS", "INJURY & VIOLENCE", and "NATIONAL NOTIFIABLE DISEASES SURVEILLANCE SYSTEM". The middle row contains "VACCINATION", "SMOKING & TOBACCO USE", and "PREGNANCY & VACCINATION". The bottom row contains "DISABILITY & HEALTH", "CHRONIC DISEASES", and "BROWSE ALL".

**Disability Status and Types Data**

Data on disability status and six functional disability types are available for each state, the District of Columbia, and select territories. Data are also available for the US overall and by HHS region.

NATIONAL CENTER FOR HEALTH STATISTICS

INJURY & VIOLENCE

NATIONAL NOTIFIABLE DISEASES SURVEILLANCE SYSTEM

VACCINATION

SMOKING & TOBACCO USE

PREGNANCY & VACCINATION

DISABILITY & HEALTH

CHRONIC DISEASES

BROWSE ALL

# Youth Risk Behavior Surveillance System

<https://www.cdc.gov/healthy-youth/index.html>



## Data Summary & Trends Report for Dietary, Physical Activity, and Sleep Behaviors

Report uses YRBS data to describe trends in youth behaviors: diet, physical activity, and sleep.

[Learn More >](#)

**YOUTH RISK BEHAVIOR SURVEY DATA SUMMARY & TRENDS REPORT FOR DIETARY, PHYSICAL ACTIVITY, AND SLEEP BEHAVIORS: 2013-2023**

## Mental Health

There is a role for everyone in supporting teen mental health.



## What Works in Schools

This school-based approach promotes adolescent health and well-being.



## Supporting LGBTQ+ Youth

Several practices can improve the health, safety, and school connectedness for LGBTQ+ youth.



# Getting YRBSS data

Home Health Topics ▾ Outbreaks ▾ About CDC ▾ | Sign In

About Data Related Content Actions ▾ Export

## DASH - Youth Risk Behavior Surveillance System (YRBSS): Middle School Youth Risk Behaviors

1991-2017. Middle School Dataset. The Youth Risk Behavior Surveillance System (YRBSS) monitors six categories of priority health behaviors among youth and young adults: 1) behaviors that contribute to unintentional injuries and violence; 2) tobacco use; 3) alcohol and...

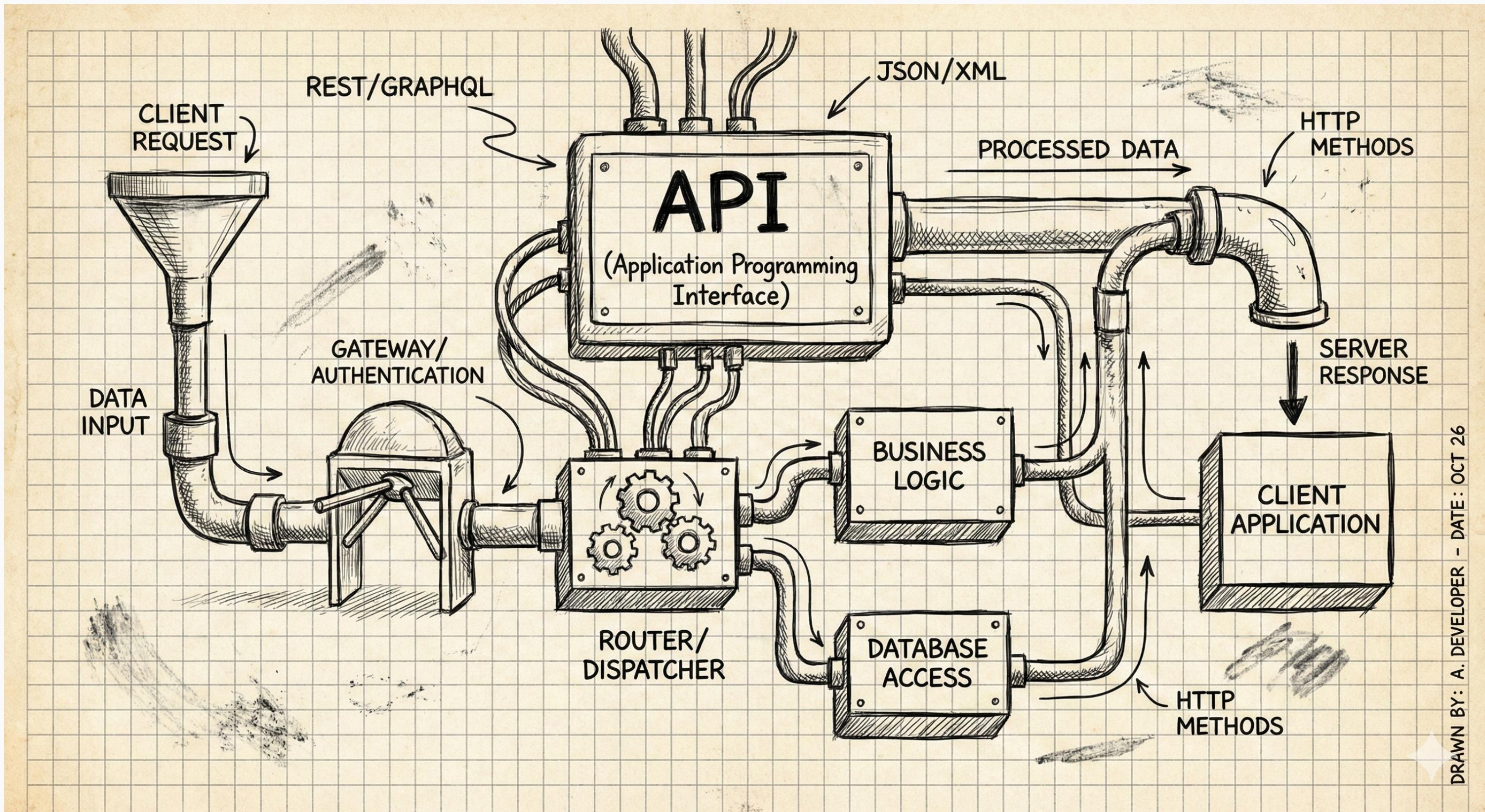
[Read more ▾](#)

Last Updated  
August 25, 2023

Data Provided By  
Division of Adolescent School Health (DASH)

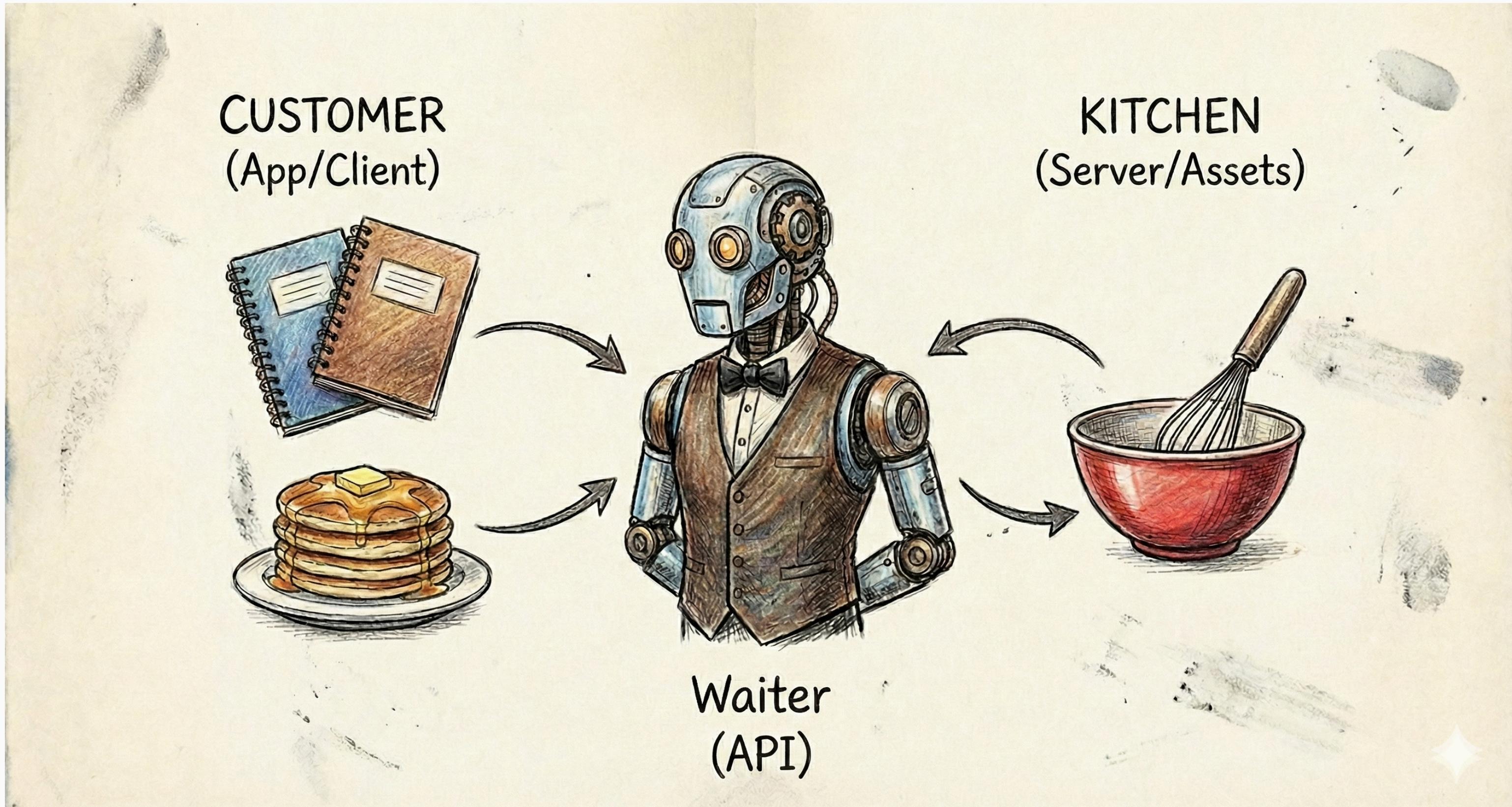
[https://data.cdc.gov/Youth-Risk-Behaviors/DASH-Youth-Risk-Behavior-Surveillance-System-YRBSS/k5bc-k3g8/about\\_data](https://data.cdc.gov/Youth-Risk-Behaviors/DASH-Youth-Risk-Behavior-Surveillance-System-YRBSS/k5bc-k3g8/about_data)

# What's an API?



An API is a defined way for one piece of software to talk to another, using a shared set of rules about what you can ask for and how you must ask.

# What's an API (less technical)?



An API is like a restaurant menu for a service: it doesn't show the kitchen, but it lets a patron know what they can order and how to ask for it.

# What do we have to do?

## Steps

- Prompt Claude to get CDC data and display the results in Claude
- Ask Claude to convert the work into R.
- Copy the code to posit.cloud
- Debug the code
  - Advice: Use another chat tool if Claude becomes arrogant.

# Ask Claude to get the data

**This is the entire prompt to use:**

- . Get the data from this API and create a simple list report. <https://data.cdc.gov/resource/k5bc-k3g8.json>
- . Do not use an LLM.
- . Just list the first 50 rows.
- . Stop at the first failure and explain what happened.

# Our main prompt - Starting with a problem

This error results from the way Claude generates its internal code.

J show me the data from this api - <https://data.cdc.gov/resource/k5bc-k3g8.json>

1 step

Failed to fetch https://data.cdc.gov/resource/k5bc-k3g8.json ⚠

Reconciled permissions issue and retried API request. ▼

Let me try fetching that directly:

2 steps

Fetch CDC API data with verbose output to debug ▼

Identified access restriction, contemplated alternative search strategy. ▼

I'm unable to directly fetch data from `data.cdc.gov` because it's not in the list of allowed network domains for my computer environment. The allowed domains are primarily package registries (npm, pypi, github, etc.).

However, I can search the web to find information about this dataset and potentially view its contents:

5 steps

That didn't provide much content. ▼

# Our main prompt - Using 'fetch'

I want to use this API: <https://data.cdc.gov/resource/k5bc-k3g8.json>

Please \*fetch\* the data from this URL and create a simple list report. Do not use an LLM. Just list the first 50 rows

## CDC YRBSS Data Report - First 50 Rows

**Data Source:** <https://data.cdc.gov/resource/k5bc-k3g8.json>

**Dataset:** Youth Risk Behavior Surveillance System (YRBSS)

**Topic:** Alcohol and Other Drug Use

### Row 1

- **Year:** 2017
- **Location:** Boston, MA
- **Question:** Ever used marijuana
- **Sex:** Total | **Race:** Black or African American | **Grade:** Total

# Generate R code (YRBSS-1)

## Next prompt:

Now convert this to R code that I can copy/paste into posit.cloud

- When Claude finishes generating the R code:
  - Copy the code
  - Create a new R Script in posit.cloud
  - Paste the code
  - Save it as YRBSS-1
  - Press **Source** to run it.

CDC YRBSS Data Report - R Script

Fetches data from CDC API and lists the first 50 rows

more code ...

Fetch data from CDC API

```
url <- "https://data.cdc.gov/resource/k5bc-k3g8.json"
```

```
data <- fromJSON(url)
```

more code ...

- If you get an error message (next slide), copy and paste to Claude

## R code error message

J

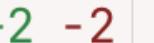
r code error - Error in `xlim()` at \_\_cloud/project/YRBSS-Report-backup.R:161:3\_\_:\_! Discrete value supplied to a continuous scale. `i` Example values: Hispanic or Latino, Black or African American, White, and Asian. Run `rlang::last_trace()` to see where the error occurred.

# Response from Claude

Identified axis function misapplication with categorical data. 

The error is because I used `xlim()` on a discrete (categorical) axis.

Let me fix that:

- Fix the `xlim` error by changing to `ylim` for the cc  cdc\_yrbss\_analysis.R
- Diagnosed axis function misapplication after coordinate transformation 

[View your updated R script](#)

Fixed — changed `xlim()` to `ylim()` since after `coord_flip()` the percentage axis is still controlled by `ylim()`. Should run cleanly now.



Cdc yrbss analysis  
Code · R



# Repeat Copy/Paste/Fix Error

```
> source("/cloud/project/YRBSS-1-backup.R")
```

```
=====
```

CDC YRBSS Data Report

First 50 Rows from data.cdc.gov/resource/k5bc-k3g8.json

```
=====
```

Data Source: Youth Risk Behavior Surveillance System (YRBSS)

Location: Boston, MA

Year: 2017

Row	Topic	Short Question	Sex	Race	Grade	Sample Size	Risk Value
1	Alcohol and Other Drug Use	Ever marijuana use	Female	White	6th	12	-
2	Alcohol and Other Drug Use	Ever marijuana use	Male	Hispanic or Latino	Total	324	13.78%
3	Alcohol and Other Drug Use	Ever marijuana use	Female	Hispanic or Latino	8th	100	29%
4	Alcohol and Other Drug Use	Ever marijuana use	Female	White	8th	31	-
5	Alcohol and Other Drug Use	Ever marijuana use	Total	Total	7th	504	12.71%
6	Alcohol and Other Drug Use	Ever marijuana use	Total	White	8th	54	-
7	Alcohol and Other Drug Use	Ever marijuana use	Male	Hispanic or Latino	8th	115	20.03%
8	Alcohol and Other Drug Use	Ever marijuana use	Total	White	7th	78	-
9	Alcohol and Other Drug Use	Ever marijuana use	Total	Native Hawaiian or Other Pacific Islander	6th	7	-
10	Alcohol and Other Drug Use	Ever marijuana use	Total	Total	8th	490	16.53%
11	Alcohol and Other Drug Use	Ever marijuana use	Total	White	Total	155	6.83%
12	Alcohol and Other Drug Use	Ever marijuana use	Female	White	7th	31	-
13	Alcohol and Other Drug Use	Ever marijuana use	Male	American Indian or Alaska Native	6th	0	-
14	Alcohol and Other Drug Use	Ever marijuana use	Male	White	Total	80	-
15	Alcohol and Other Drug Use	Ever marijuana use	Male	Asian	6th	11	-
16	Alcohol and Other Drug Use	Ever marijuana use	Female	Asian	6th	12	-
17	Alcohol and Other Drug Use	Ever marijuana use	Female	American Indian or Alaska Native	8th	2	-

# Have Claude create a summary report (YRBSS-2)

Use the same input data and create a summary report that includes two plots.

- Copy/Paste the R code into a **new** script in posit.cloud.

```
# =====  
# CDC YRBSS Data Summary Report Generator  
# API Endpoint: https://data.cdc.gov/resource/k5bc-k3g8.json  
# =====  
more code ...  
  
# =====  
# 1. FETCH DATA FROM CDC API  
# =====  
  
api_url <- "https://data.cdc.gov/resource/k5bc-k3g8.json"  
more code ...
```

# YRBSS-2 Output

## KEY STATISTICS: EVER MARIJUANA USE

### OVERALL (All Students, Grades 6-8)

Ever used marijuana: 12.6%  
95% Confidence Interval: [10.3% - 15.5%]  
Sample size: 1403

### BY GRADE LEVEL:

6th grade: 9.0% (n=394)  
6th grade: 3.6% (n=413)  
7th grade: 12.7% (n=504)  
7th grade: 8.0% (n=450)  
8th grade: 16.5% (n=490)  
8th grade: 12.5% (n=490)

### BY SEX:

Female: 14.8% (n=703)  
Male: 10.5% (n=694)  
Male: 9.9% (n=644)  
Female: 6.6% (n=714)

### BY RACE/ETHNICITY (sorted by rate, descending):

Hispanic or Latino: 16.8% (n=638)  
Hispanic or Latino: 12.1% (n=503)  
Black or African American: 11.9% (n=312)  
Black or African American: 8.7% (n=416)  
White: 6.8% (n=155)  
White: 5.9% (n=258)  
Asian: 5.3% (n=123)

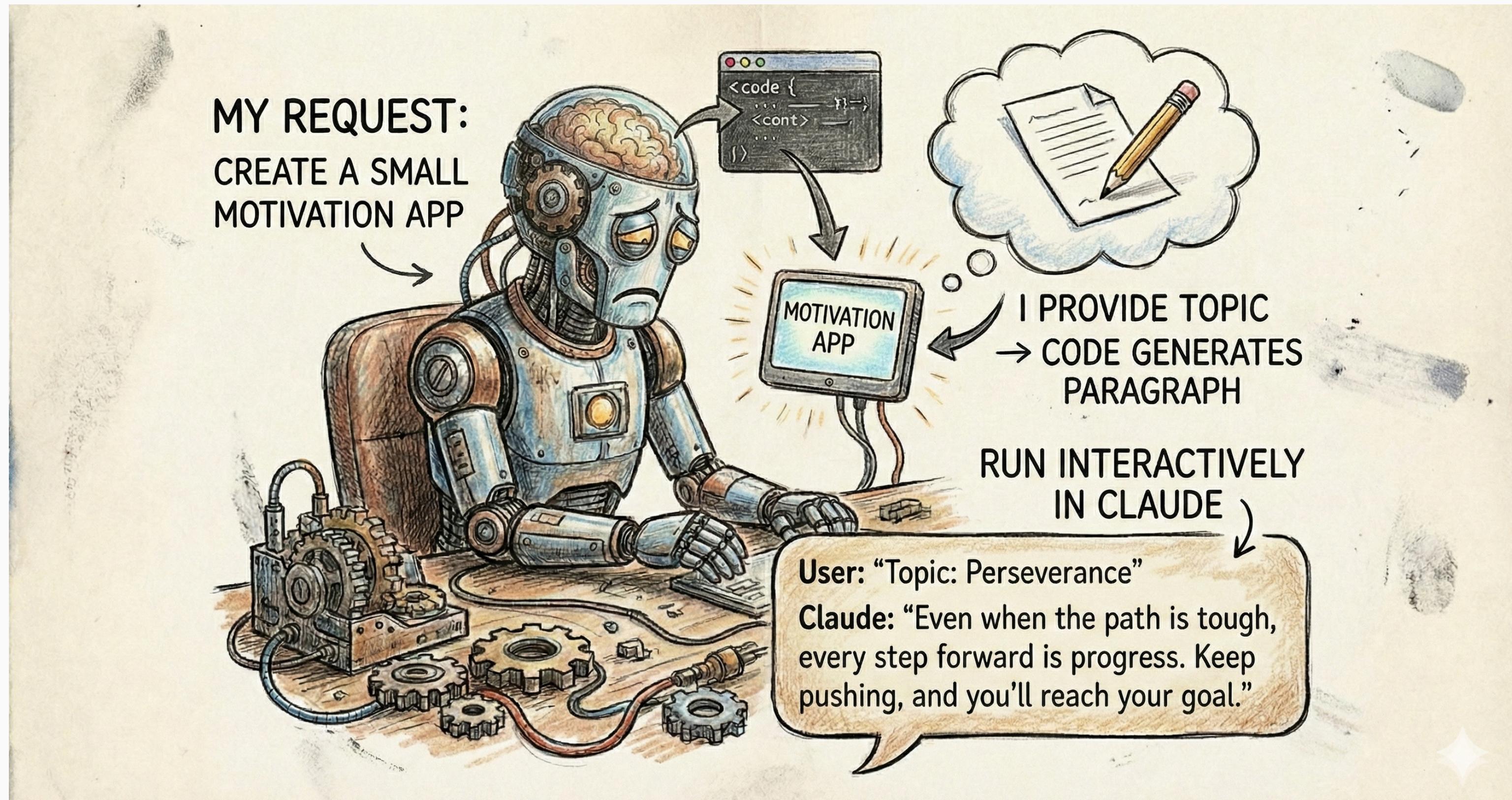
# Using an LLM with R

## Purpose

- More practice getting Claude to do what we want.
  - **Using an LLM in our code**
  - Working with API keys
  - We will create 2 reports. Motivation (in console) and Motivation-shiny (nicer interface).
    - Both reports use AI for creating the R code.
    - Both use AI as part of the code.
-

# Motivation app

I want to create a small motivation app. I will provide a topic and the code will generate a motivational paragraph. Let's run it interactively in Claude.



# Motivation Generator

✨ **Motivation Generator**

Enter any topic and get inspired!

Inspire Me!

Your motivation awaits...



# A Motivation Message

Winter darkness

Inspire Me!

 Winter darkness is not your enemy—it's your forge, the sacred crucible where resilience is hammered into unbreakable steel. In these shortened days and lengthened nights, you discover that your inner light burns brightest when external illumination fades, proving that true strength doesn't depend on perfect conditions but thrives in spite of them. The bare trees and frost-covered ground aren't symbols of death but of powerful patience, teaching you that sometimes the greatest growth happens underground, invisible and unstoppable. Embrace this season of introspection as your competitive advantage, using these quiet hours to plan, prepare, and kindle the fire that will explode into brilliance when spring arrives. Let winter's darkness become the canvas upon which you paint your most audacious dreams, knowing that those who harness the power of the dormant season emerge as unstoppable forces when the world awakens.

# Generating R code

**Prompt: If we want to convert this to so I can run it in posit.cloud using R, what has to change. i don't need an interface, just the console. Don't generate code yet. Just tell me what is different.**

1. API Key Requirement: The React artifact handles authentication automatically behind the scenes  
In R, you'll need your own Anthropic API key, typically stored as an environment variable or passed directly
2. HTTP Requests: JavaScript uses `fetch()`  
R would use the `httr` or `httr2` package to make POST requests
3. JSON Handling: JavaScript has native JSON support  
R would use the `jsonlite` package to build the request body and parse the response
4. User Input: Instead of a web form, you'd use `readline()` to prompt for topics in the console
5. No UI Layer: All the React components, state management, styling, and error display go away  
Just a simple script that prints output to the console
6. Structure: Instead of a component with hooks and event handlers, it becomes a straightforward linear script or a si  
Could add a while loop if you want to keep prompting for multiple topics

The core logic stays the same: send a topic to Claude's API, get back a motivational paragraph, display it. It's just

# The API Key

API keys 1

API keys are owned by workspaces and remain active even after the creator is removed

KEY	WORKSPACE	CREATED BY	CREATED AT ^	LAST USED AT	COST ⓘ
motivation-key sk-ant-api03-lxS...dgAA	Default ⓘ	Jim jcodygroup@gmail.com	Dec 6, 2025	Dec 10, 2025	\$0.20 ...

**Credit balance**

Your credit balance will be consumed with API, Claude Code and Workbench usage. You can buy credits directly or set up auto-reload thresholds.

**\$4.79**  
Remaining Balance

Charged to  
American Express •••• 8019 ⓘ [Buy credits](#)

(X) Auto reload is disabled. Enable auto reload to avoid API interruptions when credits are fully spent. [Edit](#)

## Code: Get the API key

```
# Set your API key (or use Sys.setenv(ANTHROPIC_API_KEY = "your-key-here"))
# You can also set this in your .Renviron file

api_key <- Sys.getenv("ANTHROPIC_API_KEY")
```

## Code: Build the prompt

```
# Build the request body
body <- list(
  model = "claude-sonnet-4-20250514",
  max_tokens = 1000,
  messages = list(
    list(
      role = "user",
      content = paste0(
        'Write a single inspiring and motivational paragraph about: ''', topic, "''. ",
        'Make it uplifting, energizing, and actionable. Use vivid language that sparks determination. ',
        'Keep it to one well-crafted paragraph (4-6 sentences). ',
        'Do not include any preamble or explanation--just the motivational paragraph itself.'
      )
    )
  )
)

more code ...
```

## Code: Make the API request

```
# Make the API request
response <- POST(
  url = "https://api.anthropic.com/v1/messages",
  add_headers(
    `x-api-key` = api_key,
    `anthropic-version` = "2023-06-01",
    `content-type` = "application/json"
  ),
  body = toJSON(body, auto_unbox = TRUE),
  encode = "raw"
)
```

## Code: The interface

```
cat("\n")
cat("=====\\n")
cat("      □ MOTIVATION GENERATOR □ \\n")
cat("=====\\n")
cat("Enter a topic to get inspired!\\n")
cat("Type 'quit' to exit.\\n\\n")
```

more code ...

# Running the code

Console Terminal × Background Jobs ×

R ▾ R 4.5.2 · /cloud/project/ ↗

```
> source("/cloud/project/motivation-backup.R")
```

=====

✨ MOTIVATION GENERATOR ✨

=====

Enter a topic to get inspired!  
Type 'quit' to exit.

Enter topic: getting an api key

Generating motivation...

🔥 Today is the day you unlock the digital gateway to limitless possibilities—your API keys, but the master key to a universe of data, functionality, and innovation waiting at your fingertips. With this key in hand, you can access the tools and resources that will transform your vision into reality. The digital world is vast and full of opportunities, and this is your moment to take advantage of them. Each click brings you closer to breaking down the walls between imagination and implementation. As you work with powerful services and your code will speak fluently with the digital giants of tomorrow, you'll realize that nothing is impossible. You have the power to create something truly remarkable. So go forth and build the future you've always wanted. You're a digital architect, and the world needs you.

Enter topic: quit

Stay motivated! Goodbye! 💪

# Motivation with Shiny interface

## Code: Get the API key

```
# Set your API key (or use Sys.setenv(ANTHROPIC_API_KEY = "your-key-here"))
# You can also set this in your .Renviron file

api_key <- Sys.getenv("ANTHROPIC_API_KEY")
```

## Code: Build the prompt - Stays the same

```
# Build the request body
body <- list(
  model = "claude-sonnet-4-20250514",
  max_tokens = 1000,
  messages = list(
    list(
      role = "user",
      content = paste0(
        'Write a single inspiring and motivational paragraph about: ''', topic, '''.' ,
        'Make it uplifting, energizing, and actionable. Use vivid language that sparks determination. ' ,
        'Keep it to one well-crafted paragraph (4-6 sentences). ' ,
        'Do not include any preamble or explanation--just the motivational paragraph itself.'
      )
    )
  )
)

more code ...
```

## Code: Make the API request

```
# Make the API request
response <- POST(
  url = "https://api.anthropic.com/v1/messages",
  add_headers(
    `x-api-key` = api_key,
    `anthropic-version` = "2023-06-01",
    `content-type` = "application/json"
  ),
  body = toJSON(body, auto_unbox = TRUE),
  encode = "raw"
)
```

## Code: The interface - styling

```
custom_css <- "  
/* Gradient background */  
body {  
  background: linear-gradient(135deg, #667eea 0%, #ec8c69 50%, #f093fb 100%);  
  min-height: 100vh;  
}  
  
/* Main container styling */  
.main-container {  
  max-width: 650px;  
  margin: 40px auto;  
  padding: 20px;  
}  
  
/* Card styling */  
.content-card {  
  background: rgba(255, 255, 255, 0.95);  
  border-radius: 20px;  
  padding: 30px;  
  box-shadow: 0 25px 50px -12px rgba(0, 0, 0, 0.25);  
}  
  
more code ...
```

## Code: The interface - The UI

```
# -----
# UI
# -----  
  
ui <- fluidPage(  
  
  # Add custom CSS  
  tags$head(  
    tags$style(HTML(custom_css))  
  ),  
  
  # Main container  
  div(class = "main-container",  
  
    # Title section  
    div(class = "app-title", HTML("✨ Motivation Generator")),  
    div(class = "app-subtitle", "Enter any topic and get inspired!"),
```

# Running the code

# ✨ Motivation Generator

Enter any topic and get inspired!

Inspire Me!

Your motivation awaits...

Powered by Claude AI

# Running the code

Winter darkness

Inspire Me!



*Within winter's embracing darkness lies your greatest opportunity to kindle an inner fire that no external force can extinguish. This season of shadows is not your enemy—it's your training ground, where resilience is forged in the quiet hours and strength is cultivated in stillness. While others retreat and hibernate, you can rise like a beacon, using these shortened days to dive deeper into your purpose, to build unshakeable habits, and to emerge from winter's cocoon transformed and unstoppable. The darkness isn't stealing your light; it's teaching you to become your own brilliant source of illumination. Embrace these long nights as sacred time to plan, prepare, and ignite the dreams that will blaze brightest when spring arrives.*

# Building an Agentic Weekly Report System

## Youth Risk Behavior Report

Week 2014 → Week 2015 | Global (All Locations)

Topic: Current marijuana use

Youth marijuana use increased significantly in the Western Pacific region (+2.8 percentage points) and among younger teens, particularly 13-17 year-olds (+1.9 points).

### Overall Risk Rate

Previous Week	Current Week	Change
3.5%	4.4%	+0.9 pts

### Key Findings

- Western Pacific region showed the largest increase in marijuana use, jumping from 2.8% to 5.6%
- Younger age groups (13 and 15-17 year-olds) drove most of the overall increase, while 13-15 year-olds bucked the trend with a decrease
- Female marijuana use increased at a higher rate (+1.2 pts) than males (+0.9 pts), though males maintain substantially higher overall usage rates

This is the prompt. Pass it in to Claude with a screenshot of the report.

**This document captures the design and architecture of an agentic weekly reporting system that autonomously produces executive-style briefs from public health data. Can we try building this agentic agent. No code just yet. Is this enough info for you to explain to me what we are going to do?**

# What we want to build



# What it should do

- Once a week:
  - Pulls data from a dashboard, database, csv or other data source
    - This example uses a .csv file
  - Asks an LLM to summarize: "What changed since last week?"
  - Generates a one-page brief or slide outline with key bullet points and a chart description
  - Optionally emails it to you as a draft for review

# Response: What it will do

**A weekly reporting agent** that autonomously produces an executive-style brief by:

1. **Fetching** data from a source (current "week" + previous "week")
2. **Comparing** this week's data to last week's (% change, direction, magnitude)
3. **Interpreting** the changes (LLM analyzes the changes. "What's significant? Any outliers?" )
4. **Generating** a formatted output (brief, slide outline, or similar)
5. **Delivering** it (Saves to file / returns output )

# Response: Why it's agentic

- The agent decides the sequence: query → interpret → summarize → format → send
- It can add extra context: "outlier this week," "metric trending the wrong way," etc., rather than just dumping numbers

## Traditional Script

Runs fixed queries, outputs a table

You define every rule

"Here are the numbers"

## Agentic Approach

Decides what's worth highlighting

LLM reasons about significance

"Here's what you should care about"

# Data Overview

For this prototype, we're using the **CDC Youth Risk Behavior Surveillance System (YRBSS)** data — a public JSON API endpoint.

Attribute	Value
Source	CDC YRBSS (Youth Risk Behavior Surveillance System)
Format	JSON array of survey records
Location	Boston, MA (for this prototype)
Topic	Alcohol and Other Drug Use (marijuana use)

## Key fields include:

- year, locationdesc, topic, subtopic
- shortquestiontext (e.g., "Ever marijuana use")
- greater\_risk\_data\_value / lesser\_risk\_data\_value (percentages)
- sample\_size, sex, race, grade
- Confidence intervals

## Note

Since the YRBSS data updates annually (not weekly), we treat **year = week** for prototyping purposes. This allows us to build and test the full agent architecture with real data.

# Data Mapping

## Real Concept

This week

Last week

Metric

Dimensions

## Our Prototype

Year 2017

Year 2015 (or whatever prior year exists)

greater\_risk\_data\_value (% who engaged in behavior)

shortquestiontext, grade, sex, race

# What the Agent Decides (Not Hardcoded)

This is where it becomes agentic rather than a dumb script:

## Decision

## How the LLM Helps

---

**What's worth highlighting?**

"8th grade marijuana use jumped 4 points — largest single-grade increase"

**What's an outlier?**

"Hispanic male usage dropped while all other demographics rose"

**What needs context?**

"Sample size for Native Hawaiian group too small to draw conclusions"

**What's the narrative?**

"Overall trend: risk behaviors increasing in middle school grades"

# Output Format (Draft)

```
# Youth Risk Behavior Report
## Week of 2017 vs. Week of 2015

### Key Findings
- Overall marijuana use: 12.6% → 14.2% (+1.6 pts)
- Largest increase: 8th graders (+3.1 pts)
- Notable outlier: Asian students showed decrease (-0.8 pts)

### Watch List
[] Hispanic 8th grade females: 29% (up from 22%)

### Data Quality Notes
- Small sample sizes for some racial categories
- Boston metro only – not nationally representative

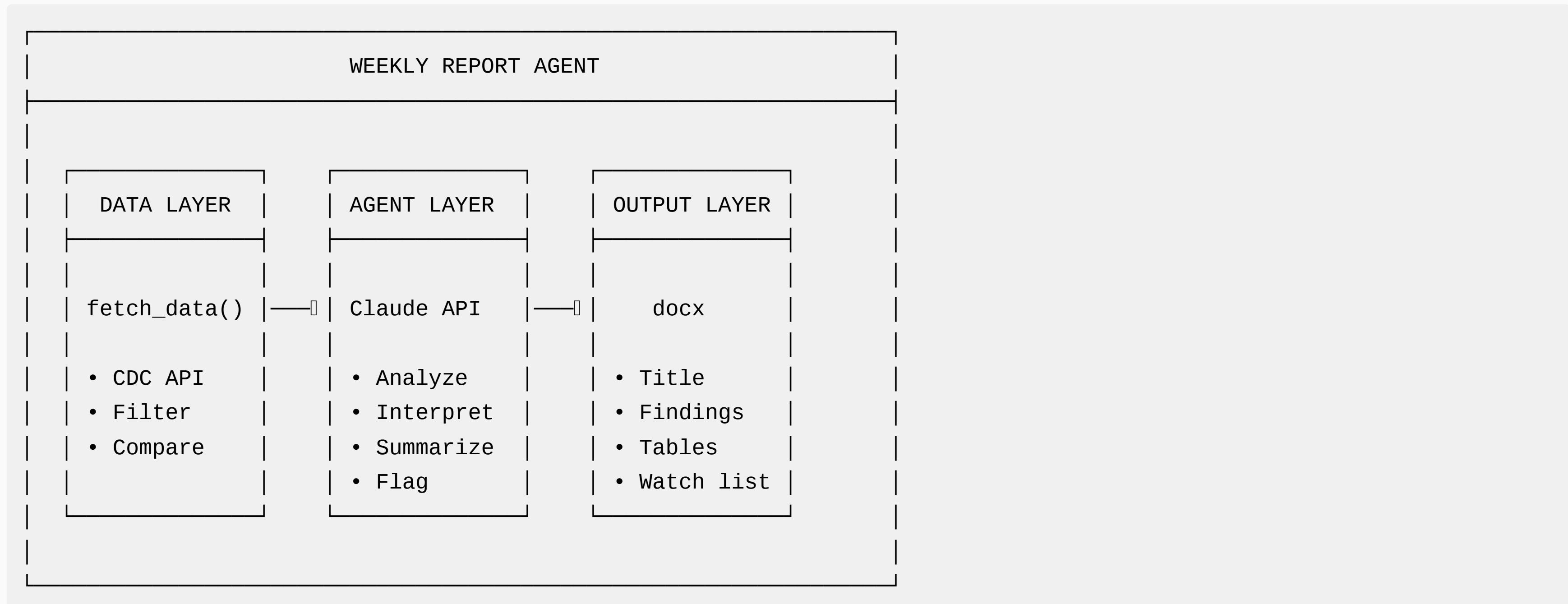
### Suggested Chart
Bar chart comparing grade-level usage rates, 2015 vs 2017
```

# Configuration Decisions

For this prototype:

- **Single location (Boston)** — yes, for now
- **Single topic (marijuana use)** — yes, to start
- **Output format** — .docx
- **LLM integration** — Use Claude's API

# Technical Architecture



# Key Components

Component	Responsibility
<b>Data Functions</b> (load_csv_data(), fetch_data_for_year(), compare_data())	Load CSV, filter by topic/location/year, compute deltas between periods
<b>Analyst Functions</b> (analyze_with_claude(), format_dimension_for_prompt())	Send structured data to Claude API with prompt: "What changed? What's significant?"
<b>Report Functions</b> (generate_report(), add_breakdown_table())	Take Claude's analysis → format as .docx with headings, bullets, tables using officer
<b>Orchestrator</b> (run_agent())	Orchestrate: load → filter → compare → analyze → generate → save

# Claude API Prompt Strategy

The agent will send Claude something like:

You are a public health data analyst. Given the following week-over-week changes in youth marijuana use (Boston), produce an executive summary.

DATA:

- Overall: 12.6% → 14.8% (+2.2 pts)
  - 6th grade: 9.0% → 10.4% (+1.4 pts)
  - 7th grade: 12.7% → 15.9% (+3.2 pts)
  - 8th grade: 16.5% → 18.3% (+1.8 pts)
- [... demographic breakdowns ...]

INSTRUCTIONS:

1. Identify the 3 most important findings
2. Flag any outliers or concerning trends
3. Note any data quality issues (small samples, missing data)
4. Suggest one visualization that would help stakeholders

Respond in structured JSON.