



User & Developer Survey 2024
Andrew Claster

Methodology

We conducted 682 interviews online among Julia users and developers June 4-26, 2024

Margin of error is +/- 3.75 percentage points

We recruited respondents online using Slack, Discourse, X, LinkedIn, email, JuliaLang.org and JuliaHub.com

The survey was administered in 6 languages: English, Chinese (Simplified and Traditional), Japanese, Korean and Spanish

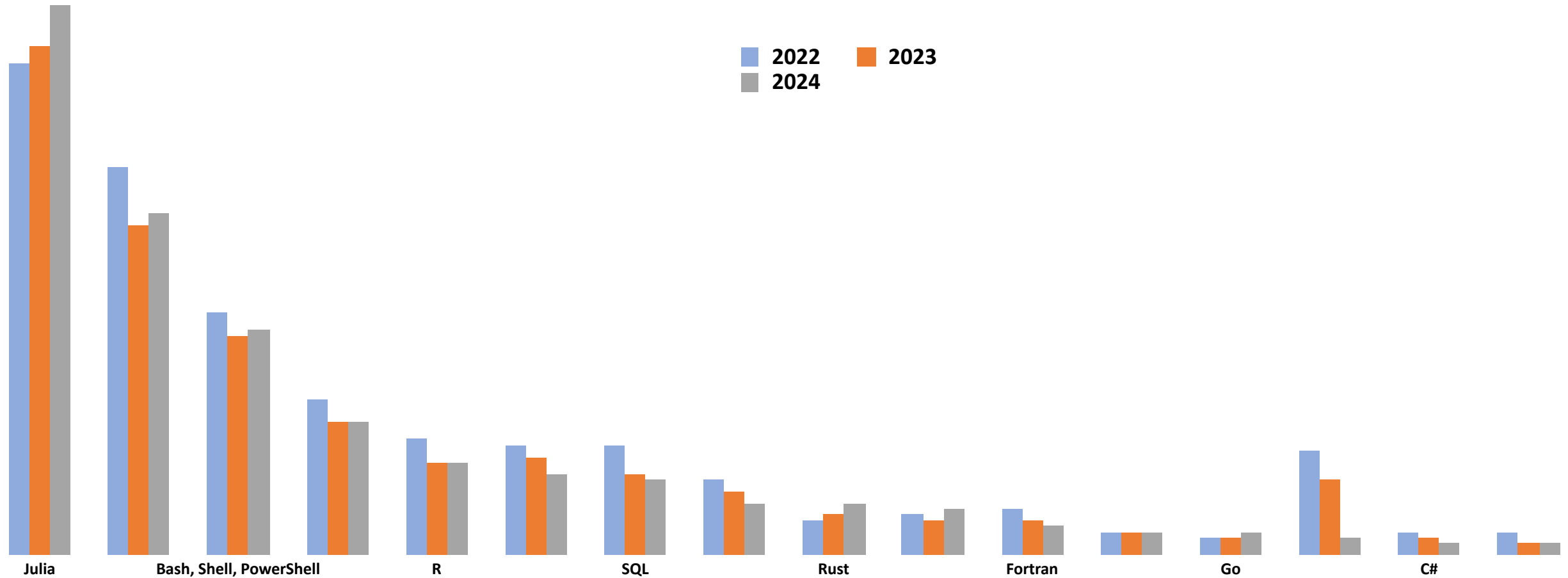
This is the sixth annual Julia User & Developer Survey we have conducted

Many of the questions and answer choices are the same from year-to-year so we have shown tracking data from previous years where that is the case.

Some of the questions and answer choices are new or updated based on new developments, previous results or feedback from the community. This is identified in the presentation.

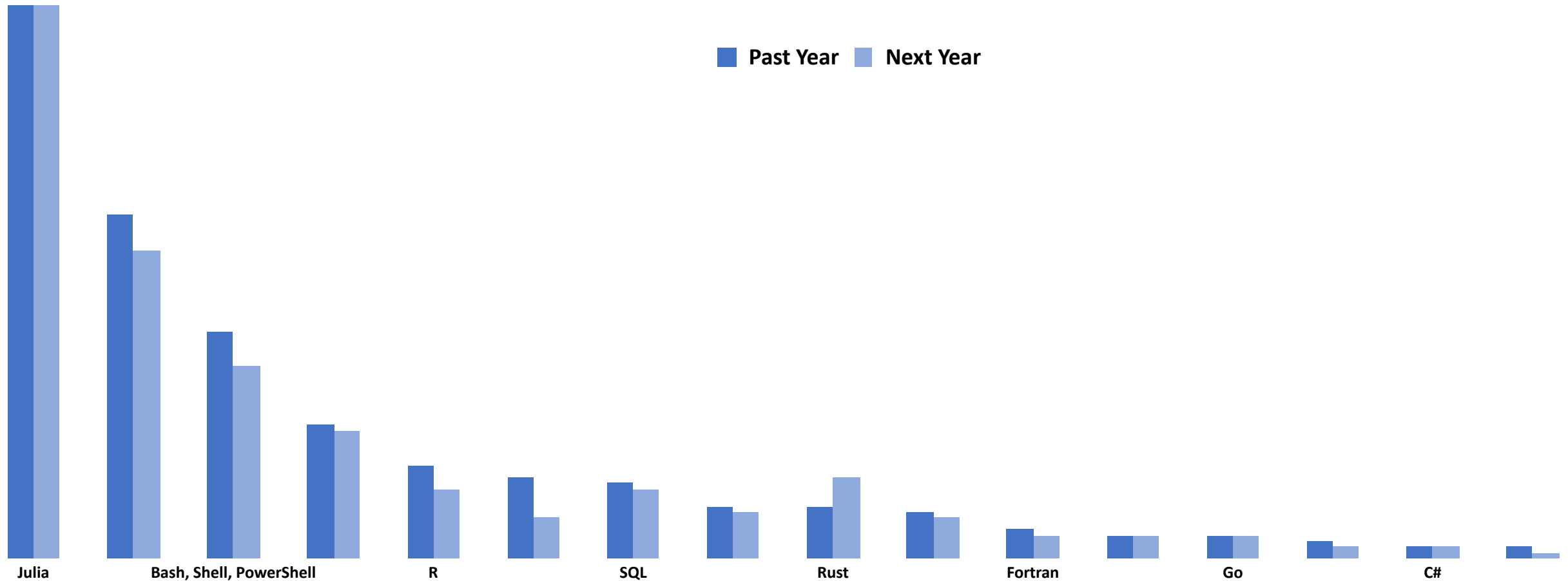
Julia Use Has Increased Among Julia Users & Developers This Year; MATLAB, Fortran, Java, C# Continue to Decline; Rust Is Rising

Which of the following languages have you used regularly or frequently during the past year?



Julia Users Plan to Use More Rust Next Year and Less MATLAB, Python, Bash, Shell, PowerShell, R and Other Languages

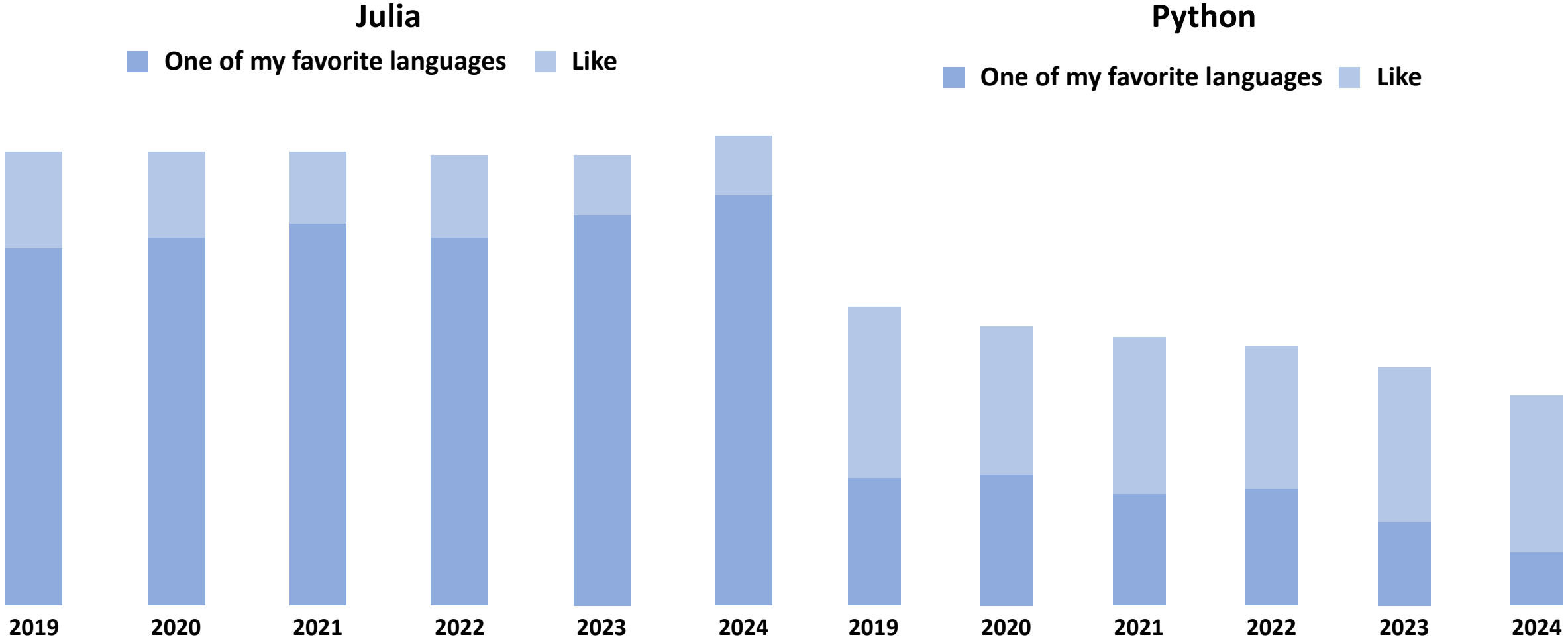
*Which of the following languages have you used regularly or frequently during the past year?
Which of the following languages do you plan to use regularly or frequently during the next year?*



84% Say Julia Is ‘One of My Favorite Languages’ – Highest Ever

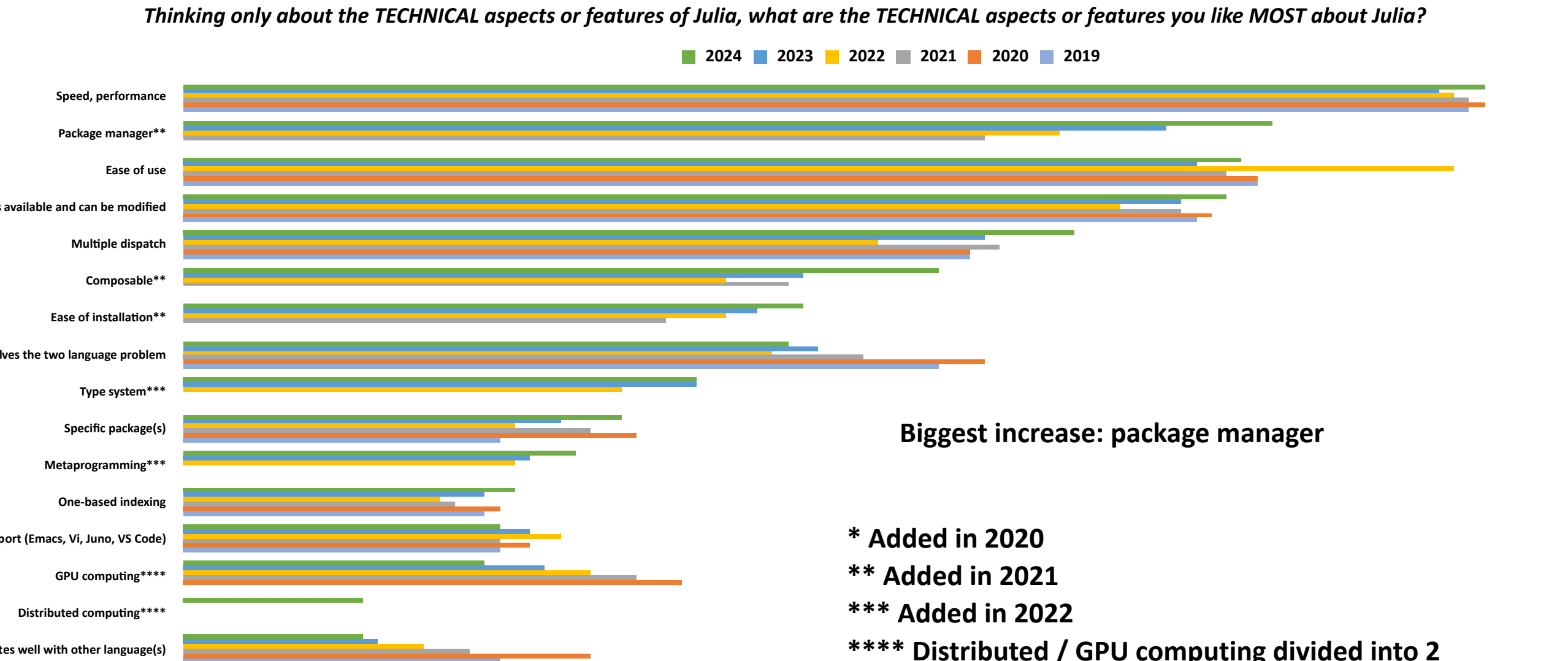
Python Has Been Declining Among Julia Users Since 2019

How much do you like each of the following languages?



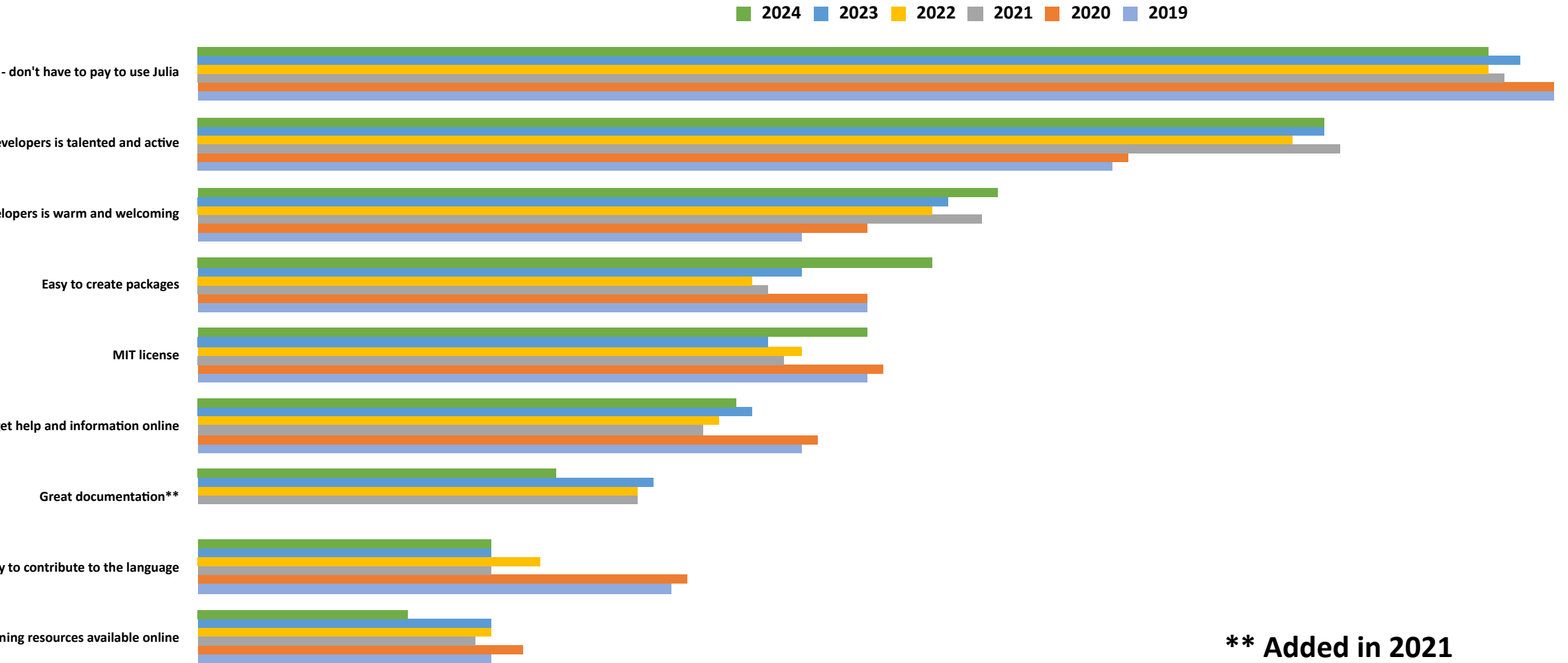
Other languages not shown include C/C++ (24% ‘one of my favorite languages’ + ‘like’), Rust (24% ‘one of my favorite languages’ + ‘like’), SQL (14% ‘one of my favorite languages’ + ‘like’), Bash/Shell/PowerShell (13% ‘one of my favorite languages’ + ‘like’), MATLAB (13% ‘one of my favorite languages’ + ‘like’) and R (13% ‘one of my favorite languages’ + ‘like’)

The MOST Popular TECHNICAL Features of Julia Are Speed/Performance, Package Manager, Ease of Use, Open Source, Multiple Dispatch and Composability



The MOST Popular NON-TECHNICAL Features of Julia Are Free (Don't Have to Pay) and the Julia Community

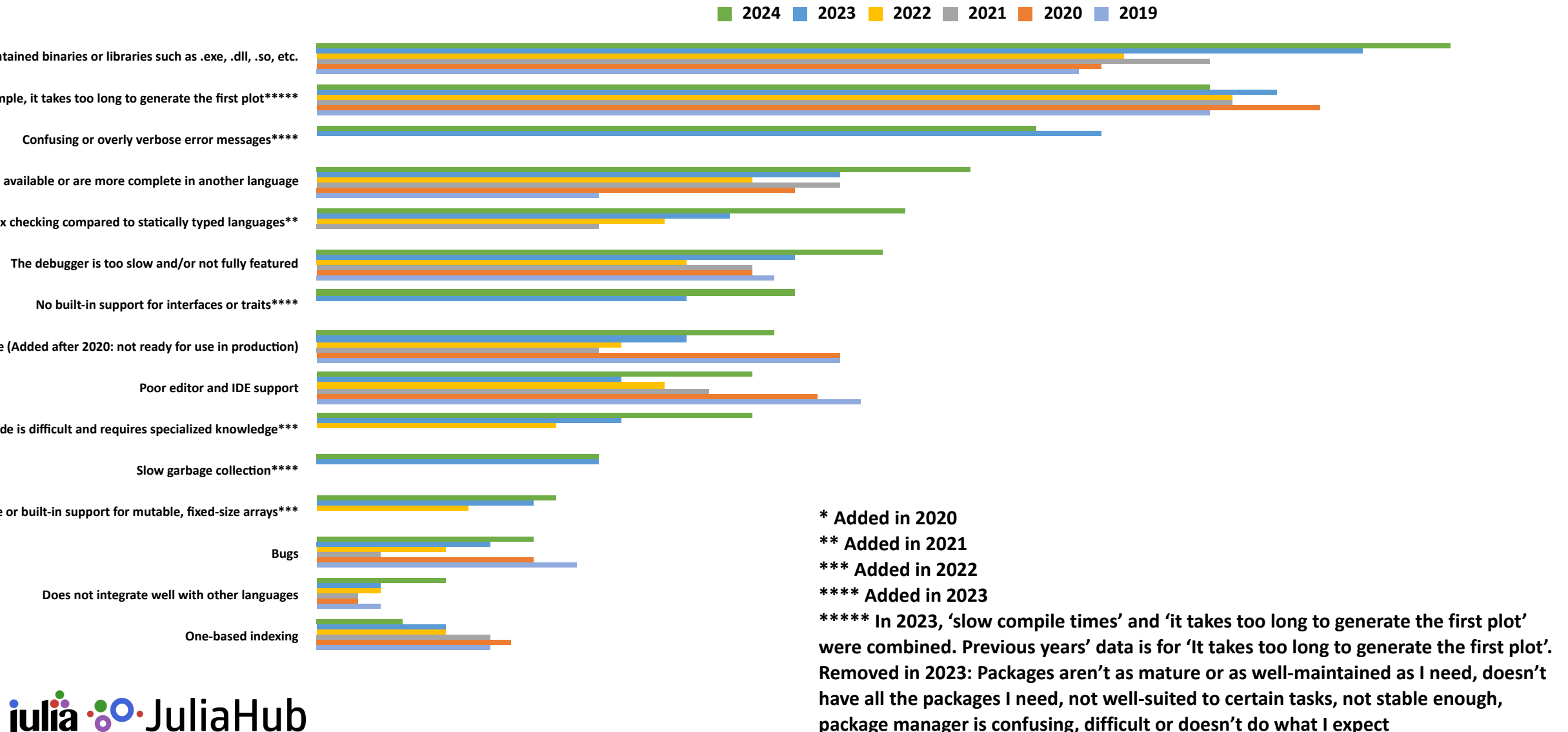
Thinking only about the NON-TECHNICAL aspects or features of Julia, what are the NON-TECHNICAL aspects or features you like MOST about Julia?



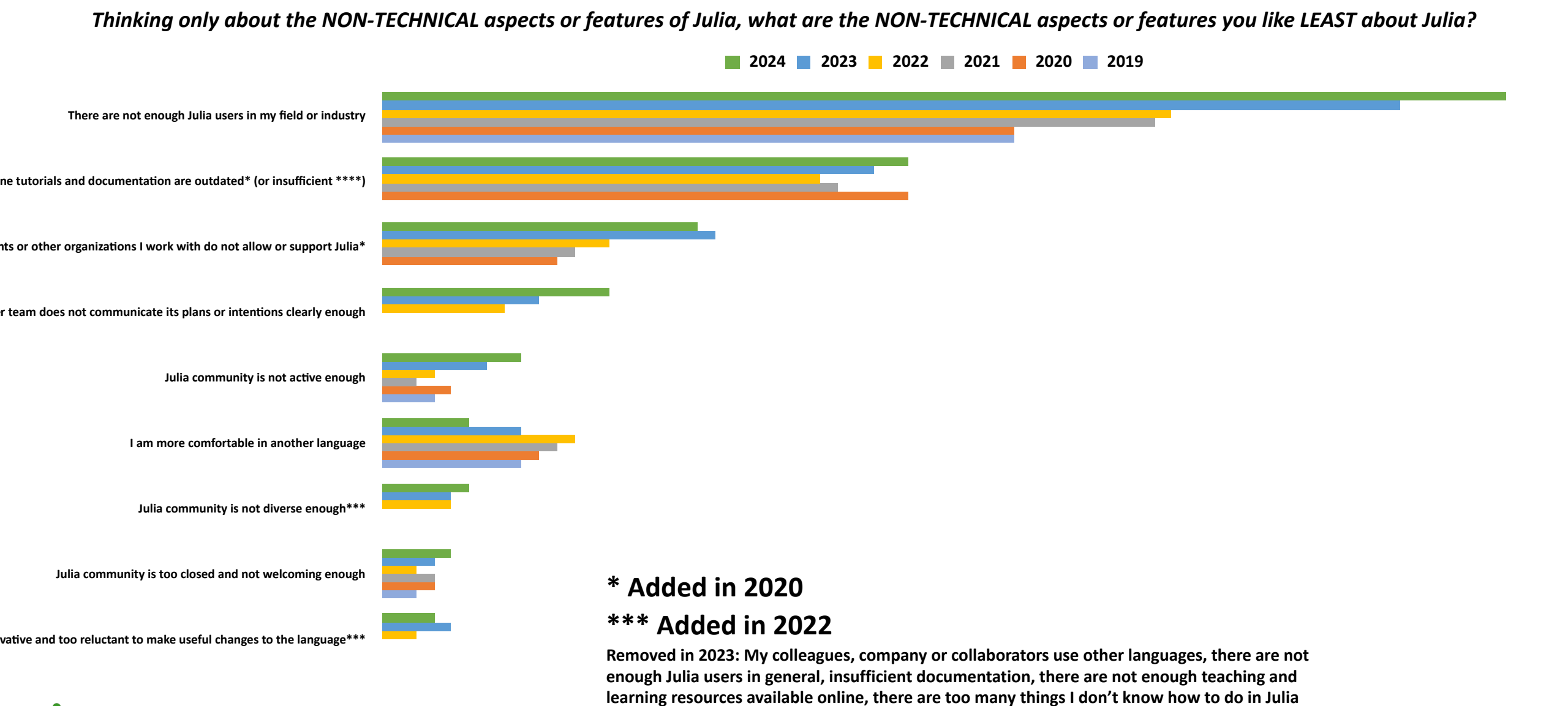
**** Added in 2021**

The Biggest TECHNICAL PROBLEMS with Julia Are Cannot Generate Self-Contained Binaries or Libraries and Slow Compile Times – Too Long to Generate First Plot

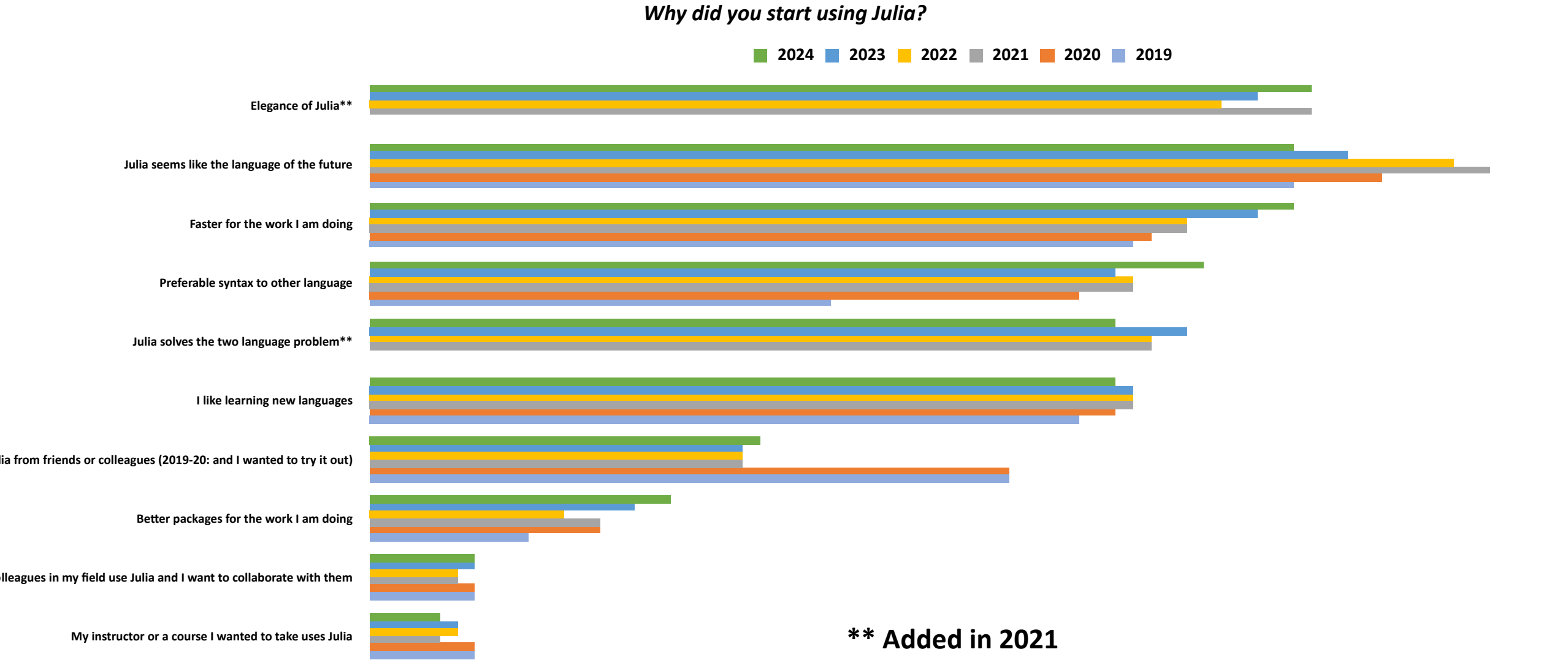
Thinking only about the TECHNICAL aspects or features of Julia, what are the TECHNICAL aspects or features you like LEAST about Julia?



The Biggest NON-TECHNICAL PROBLEM with Julia Is Related to Adoption: Not Enough Julia Users



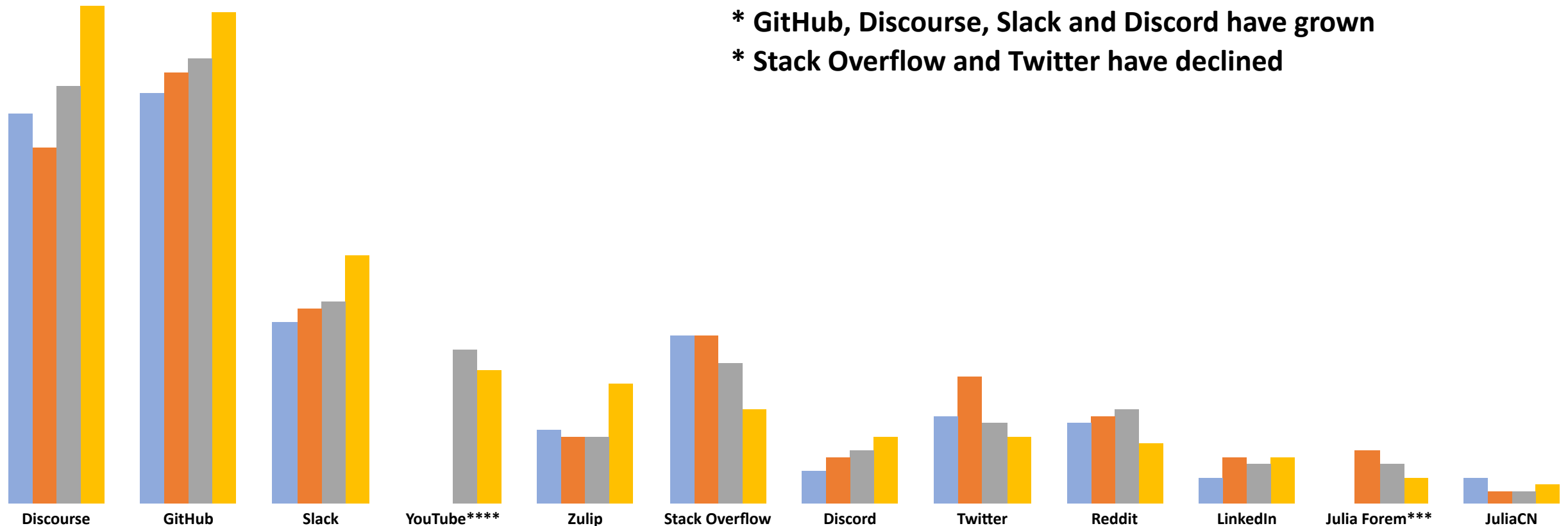
Reasons for Choosing Julia: Elegance, Seems Like the Language of the Future, Speed, Syntax, Solves the Two Language Problem



Discourse, GitHub, Slack and Zulip Are Growing; Stack Overflow, YouTube, Twitter (X), Reddit and Forem Are Shrinking

Where do you interact with the Julia community?

2021 2022 2023 2024



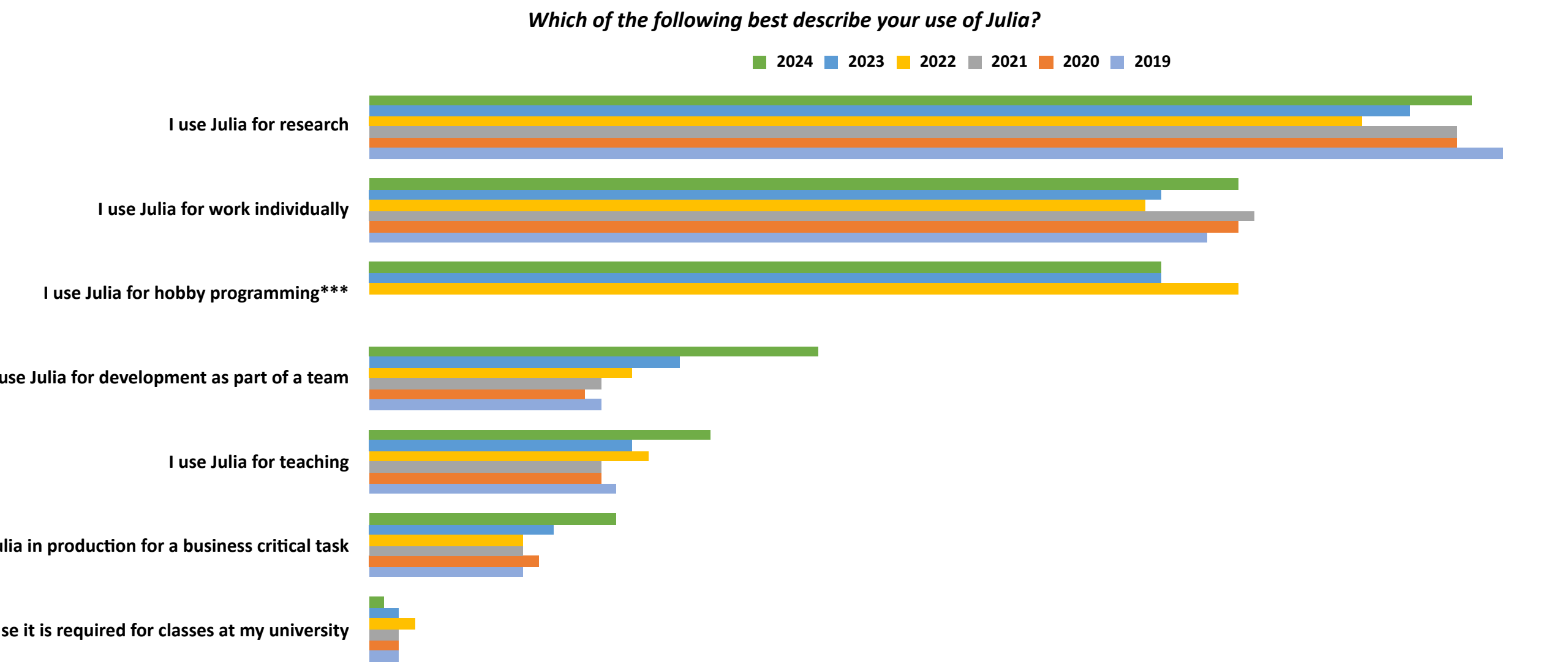
* GitHub, Discourse, Slack and Discord have grown

* Stack Overflow and Twitter have declined

*** Added in 2022

**** Added in 2023

Most Use Julia for Research, Hobby and Individual Work; Research, Individual Work, Team Development, Teaching and Business-Critical Task Use Have All Grown

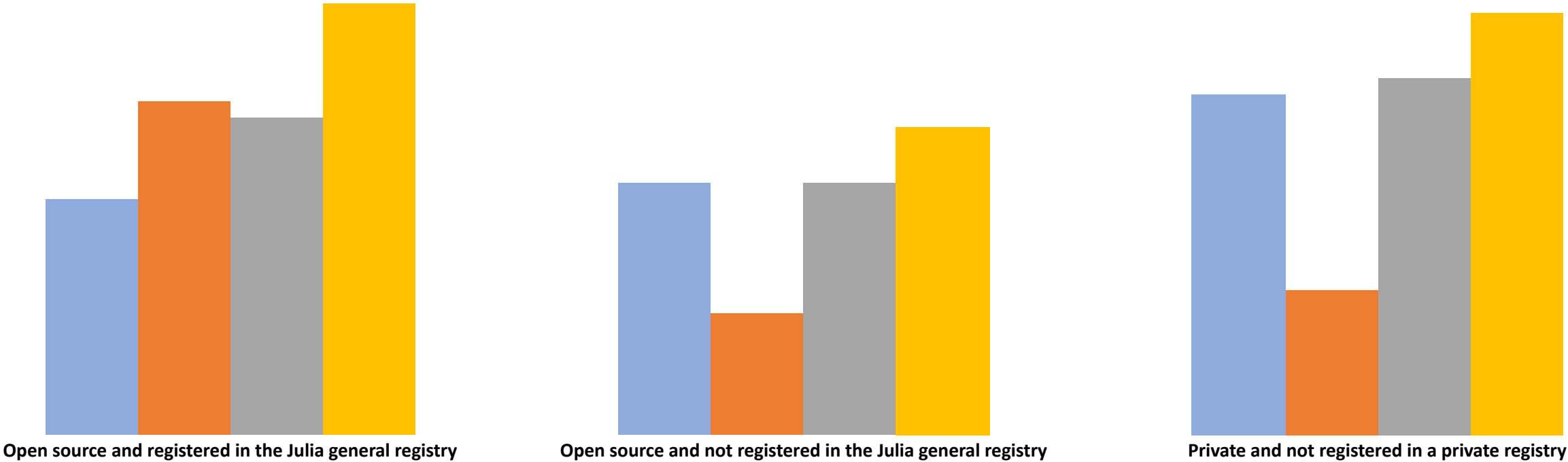


*** Added in 2022

Open Source and Private Packages Have Grown

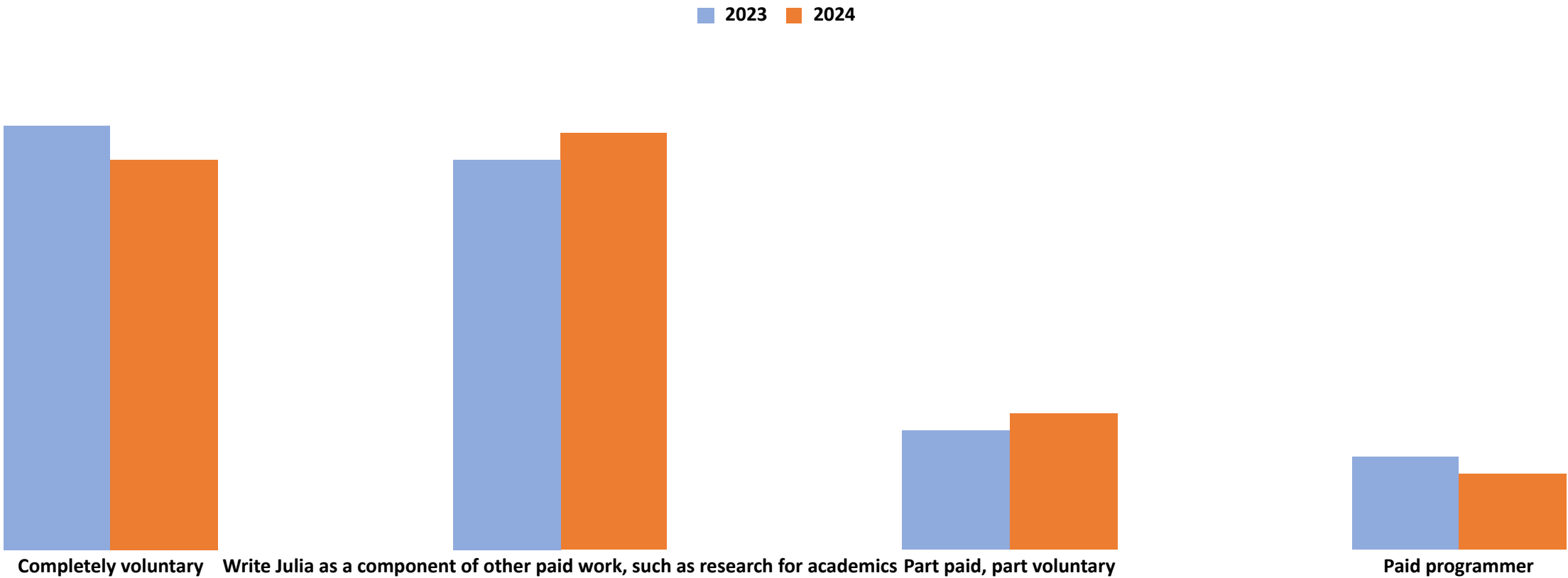
*2023: Which of the following types of Julia packages have you created or contributed to?
(2022: Which of the following types of Julia packages have you created?)
Which of the following types of Julia packages have you contributed to, including documentation or filing issues, but not created?)*

■ 2022: Created ■ 2022: Contributed to ■ 2023: Created or Contributed to ■ 2024: Created or Contributed to



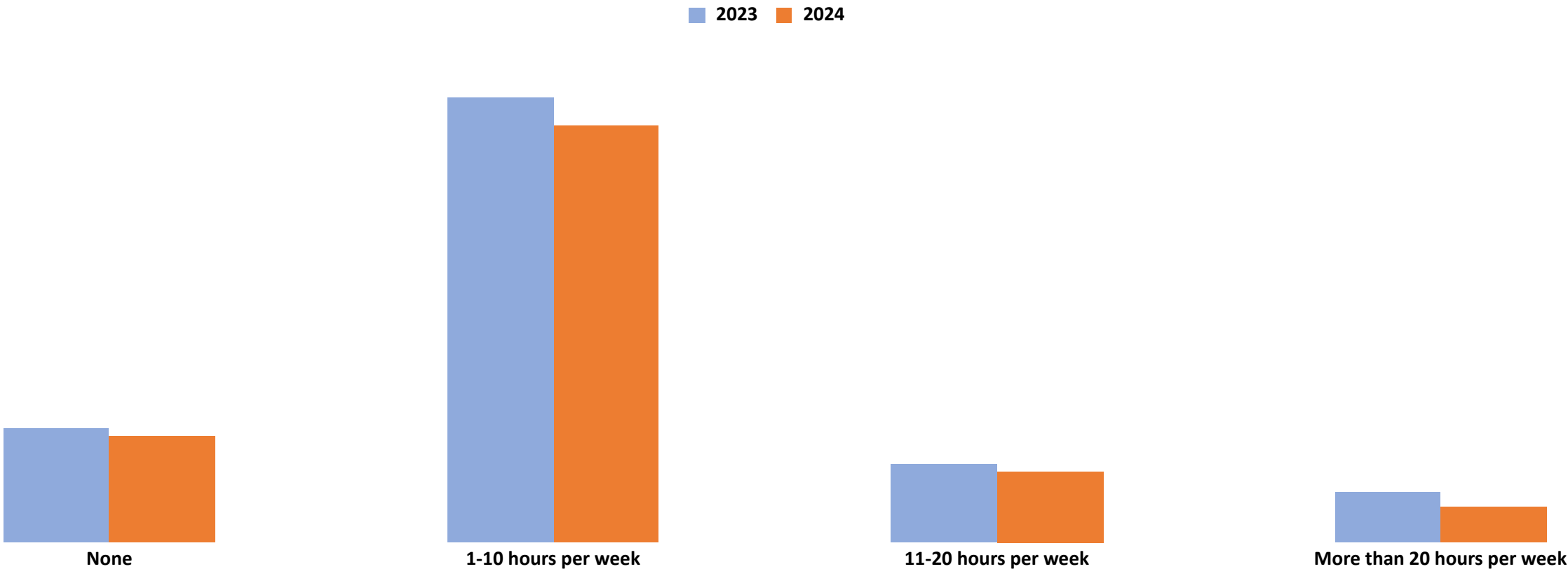
More Julia Users & Developers Are Getting Paid for Julia Work

IF OPEN-SOURCE CREATOR OR CONTRIBUTOR: In which of the following capacities do you contribute to Julia?

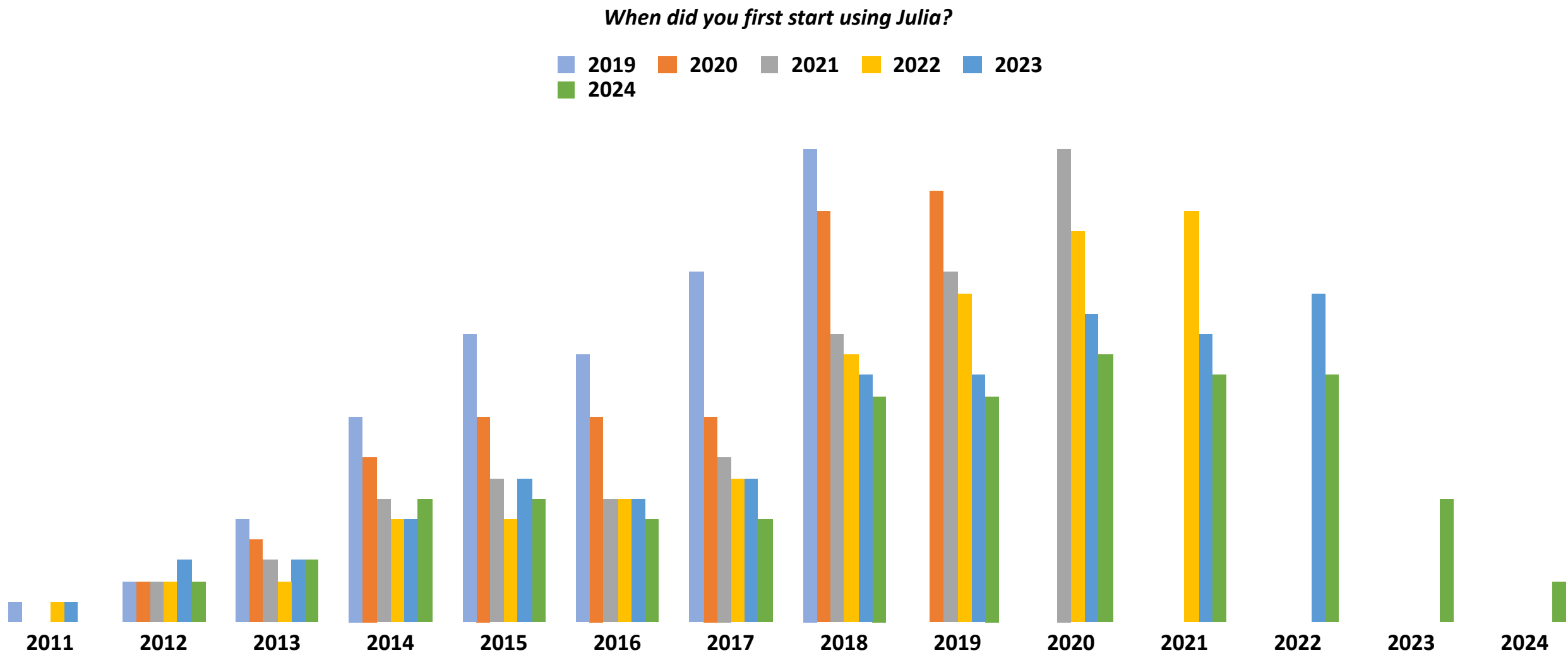


Most Open-Source Creators and Contributors Spend 1-10 Hours Per Week Working on Open Source Julia Projects or the Julia Community

IF OPEN-SOURCE CREATOR OR CONTRIBUTOR: How many volunteer hours do you spend working on open-source Julia projects or the Julia community per week?



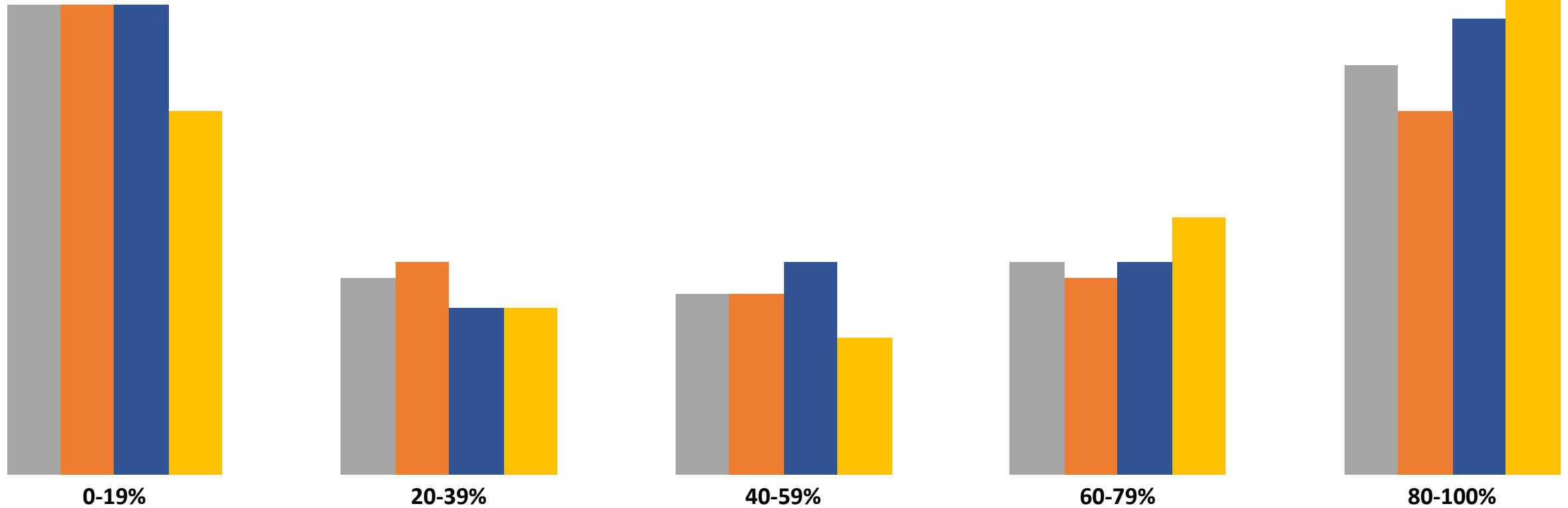
Most Users & Developers Started Using Julia Between 2018 and 2022



For the First Time, Most Julia Users & Developers Do More than 60% of Their Programming in Julia

What percentage of the programming work you do is in Julia?

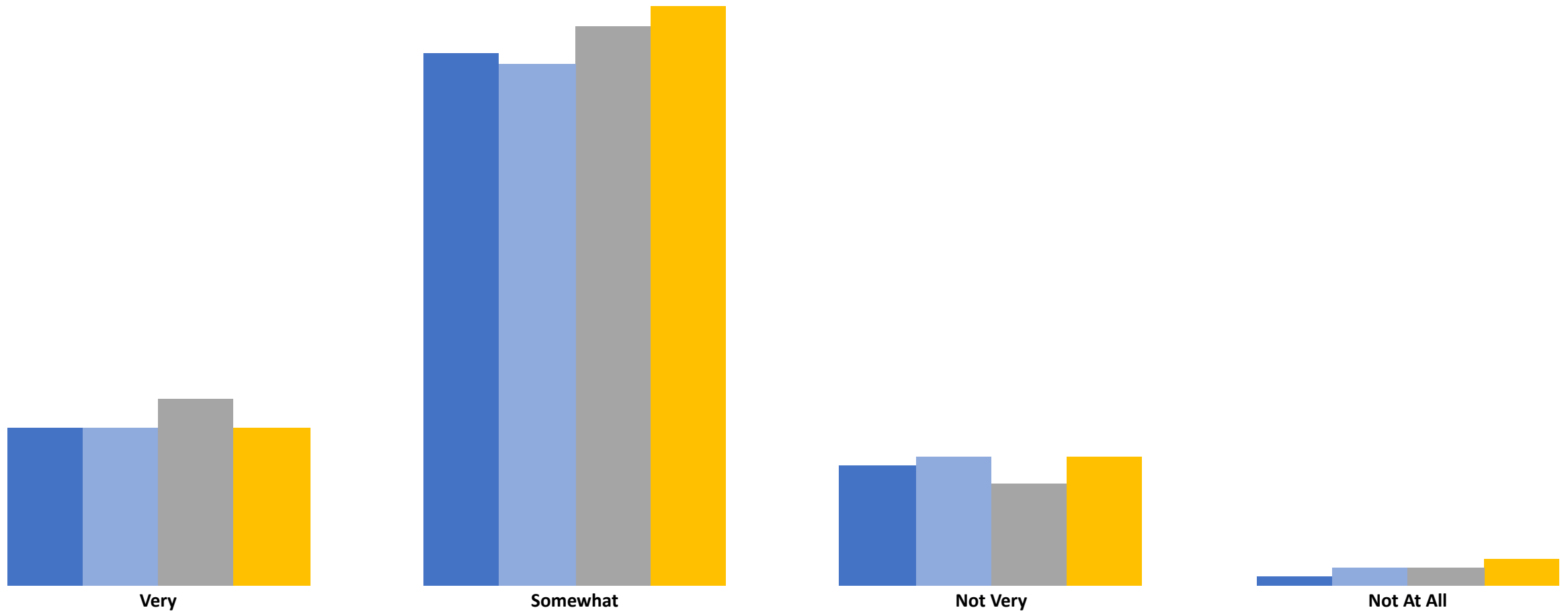
2021 2022 2023 2024



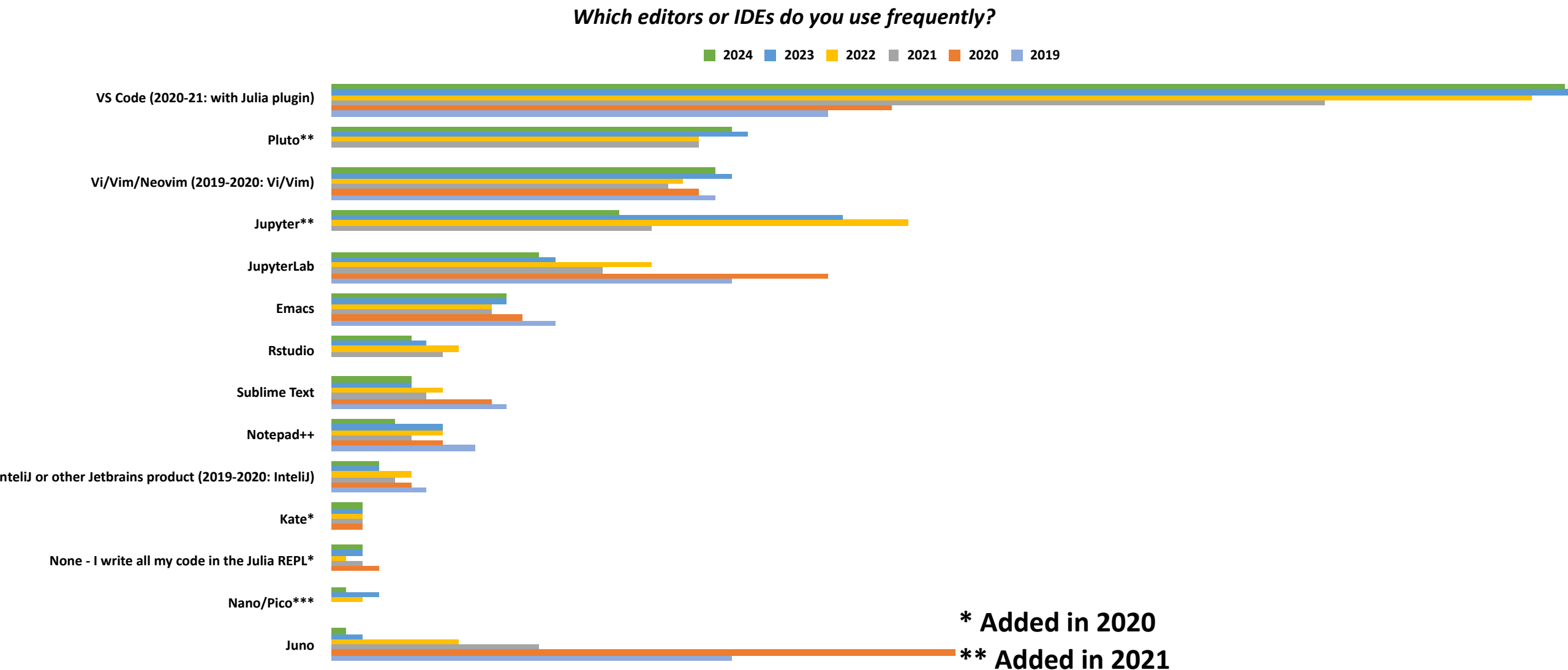
79% Say the Julia Package Ecosystem Is ‘Very’ or ‘Somewhat’ Robust

How robust is the current Julia package ecosystem?

■ 2021 ■ 2022 ■ 2023 ■ 2024

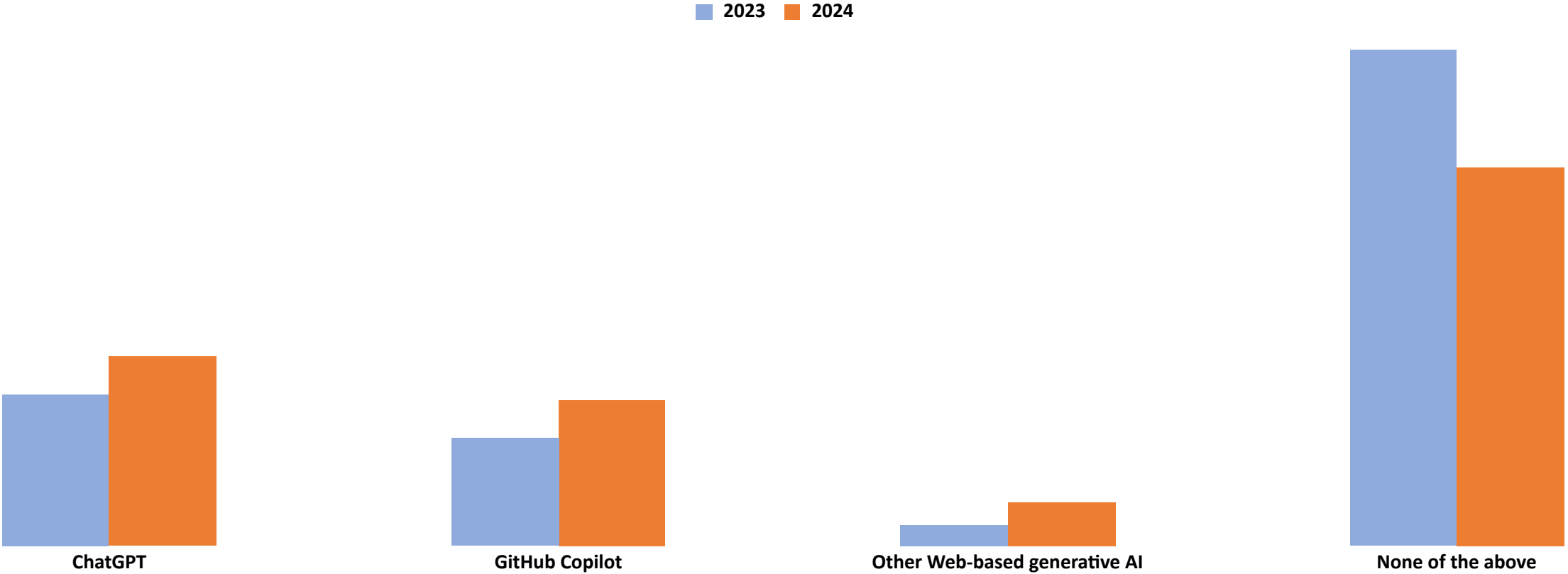


VS Code, Pluto and Vi/Vim/Neovim Are the Leading Editors or IDEs for Julia Users & Developers



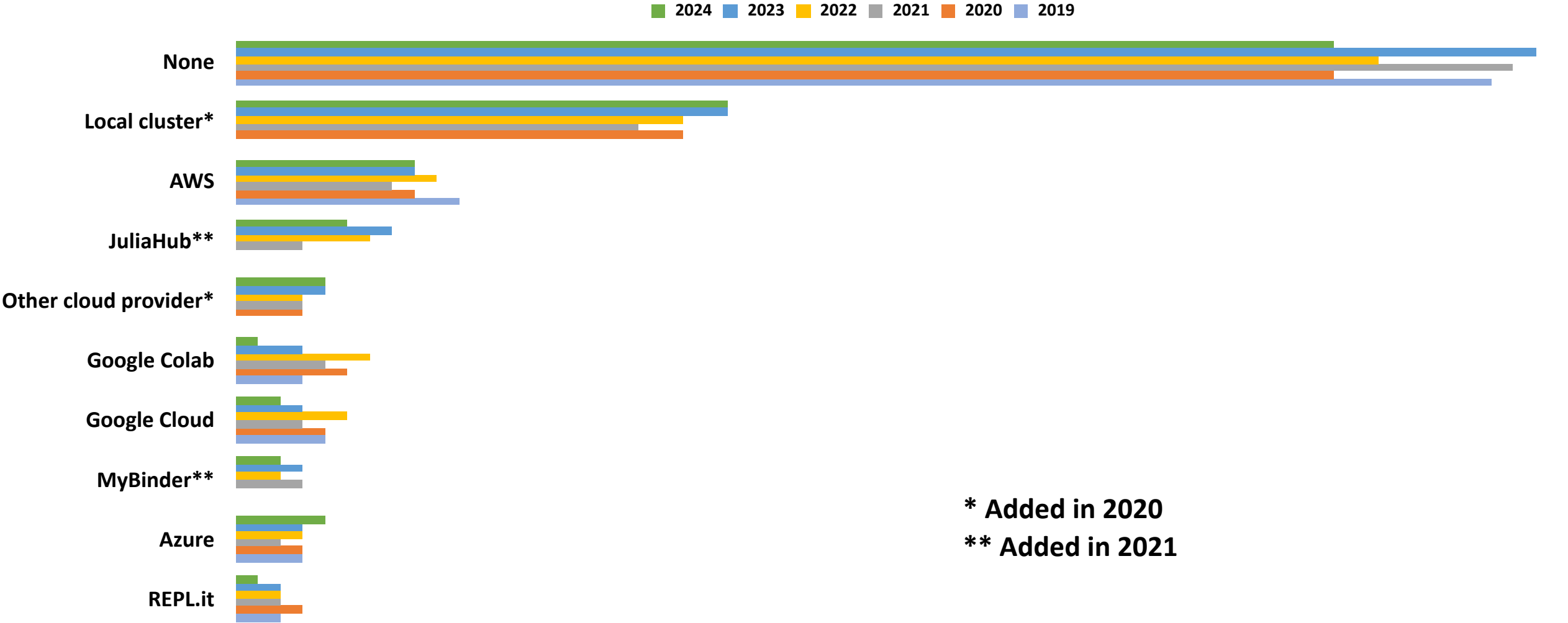
Nearly Half of Users & Developers Use AI Assistance, Up from 32% Last Year

What types of AI assistance do you use frequently with Julia?



About Half Use One or More Cloud Solutions; Local Cluster Is Most Common

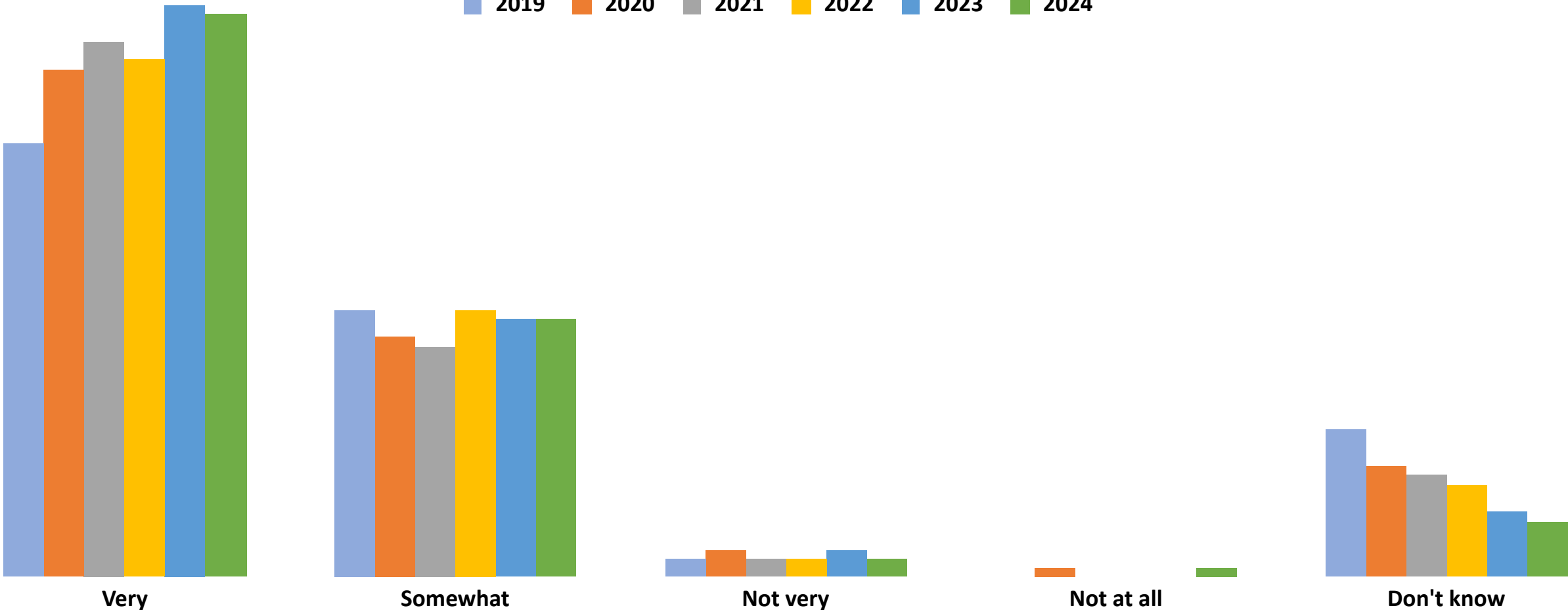
Which cloud solutions, if any, do you use together with Julia?



89% Say the Julia Community Is Very or Somewhat Helpful and Collaborative

How helpful and collaborative is the Julia community?

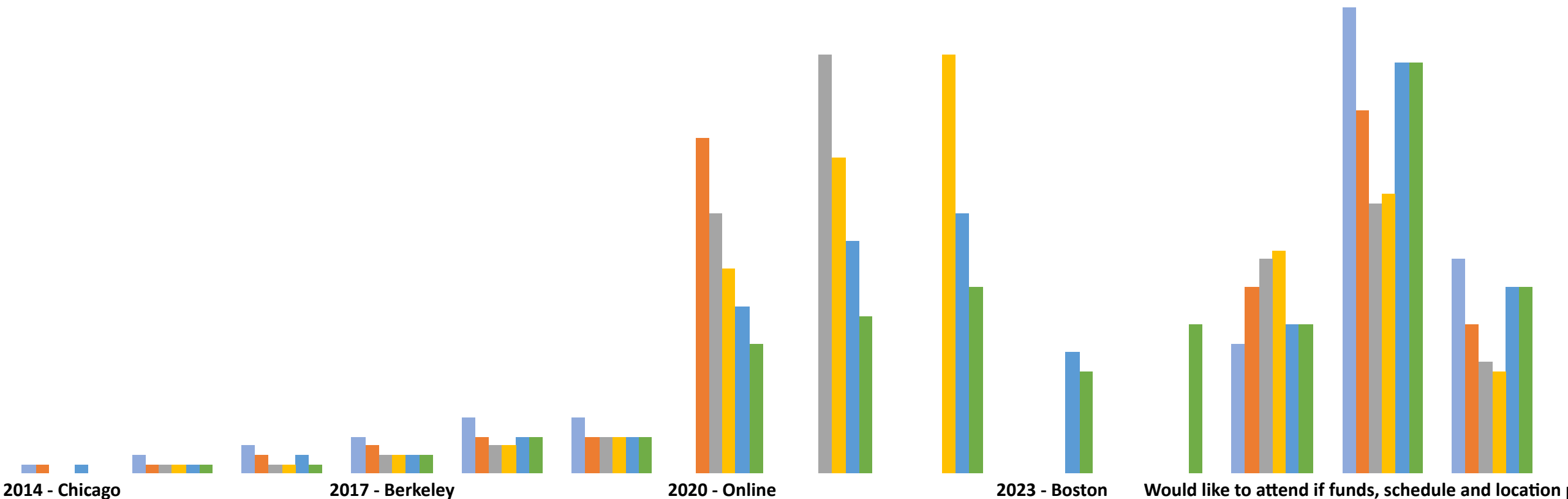
2019 2020 2021 2022 2023 2024



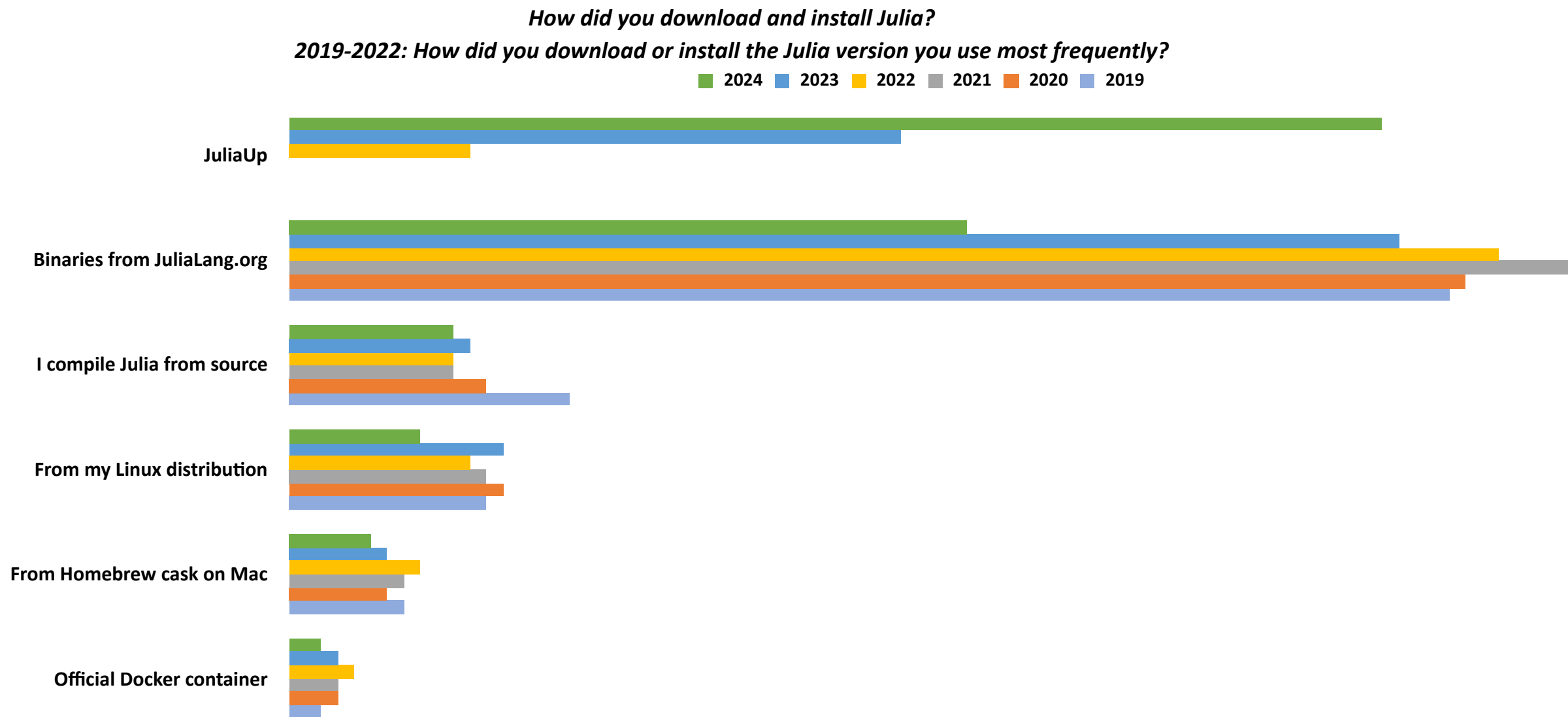
16% of Respondents Plan to Attend JuliaCon This Year – Highest Planned In-Person Attendance Ever

Have you attended or do you plan to attend JuliaCon? Please select all that apply.

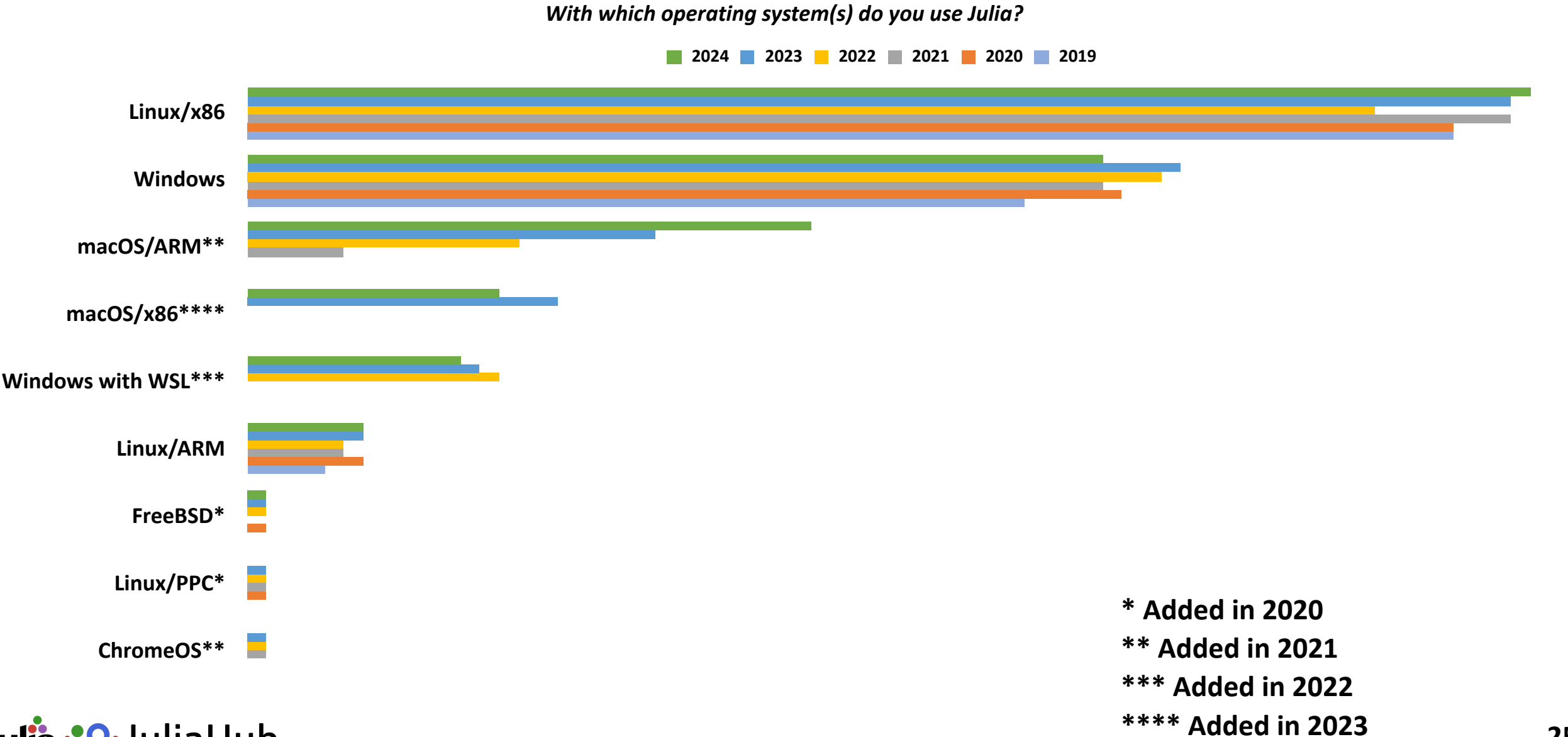
2019 2020 2021 2022 2023 2024



JuliaUp Has Overtaken JuliaLang.org Binaries As the #1 Place to Download and Install Julia

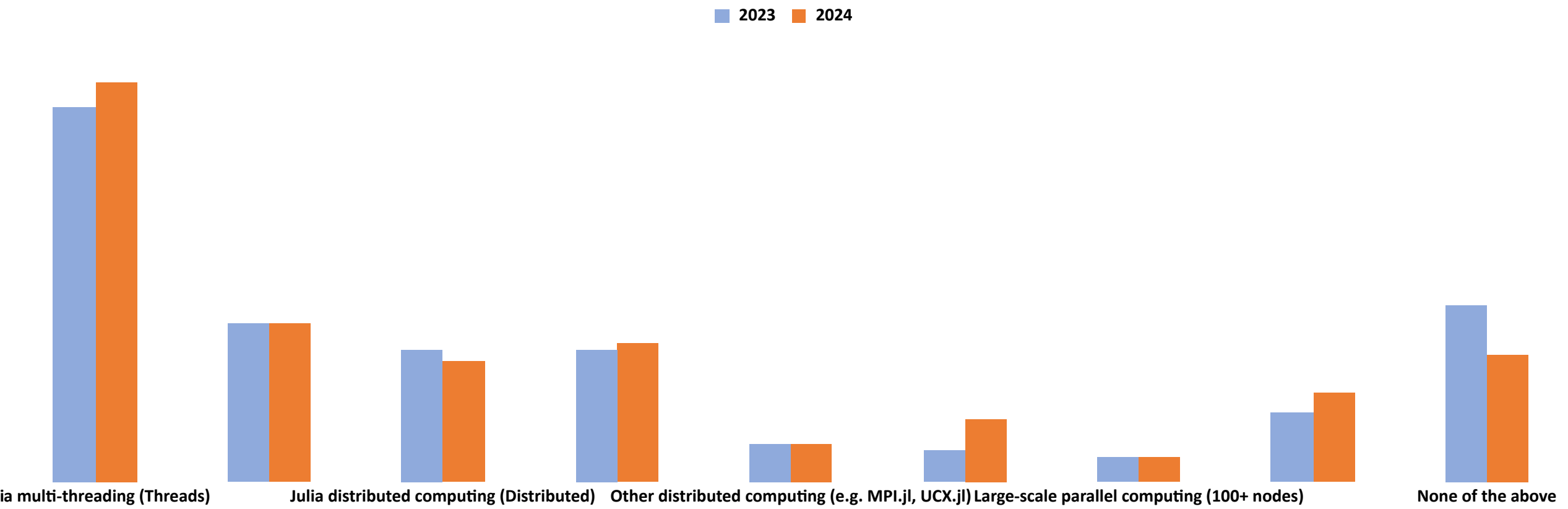


Most Still Use Julia with Linux/x86 or Windows, but macOS Is Growing

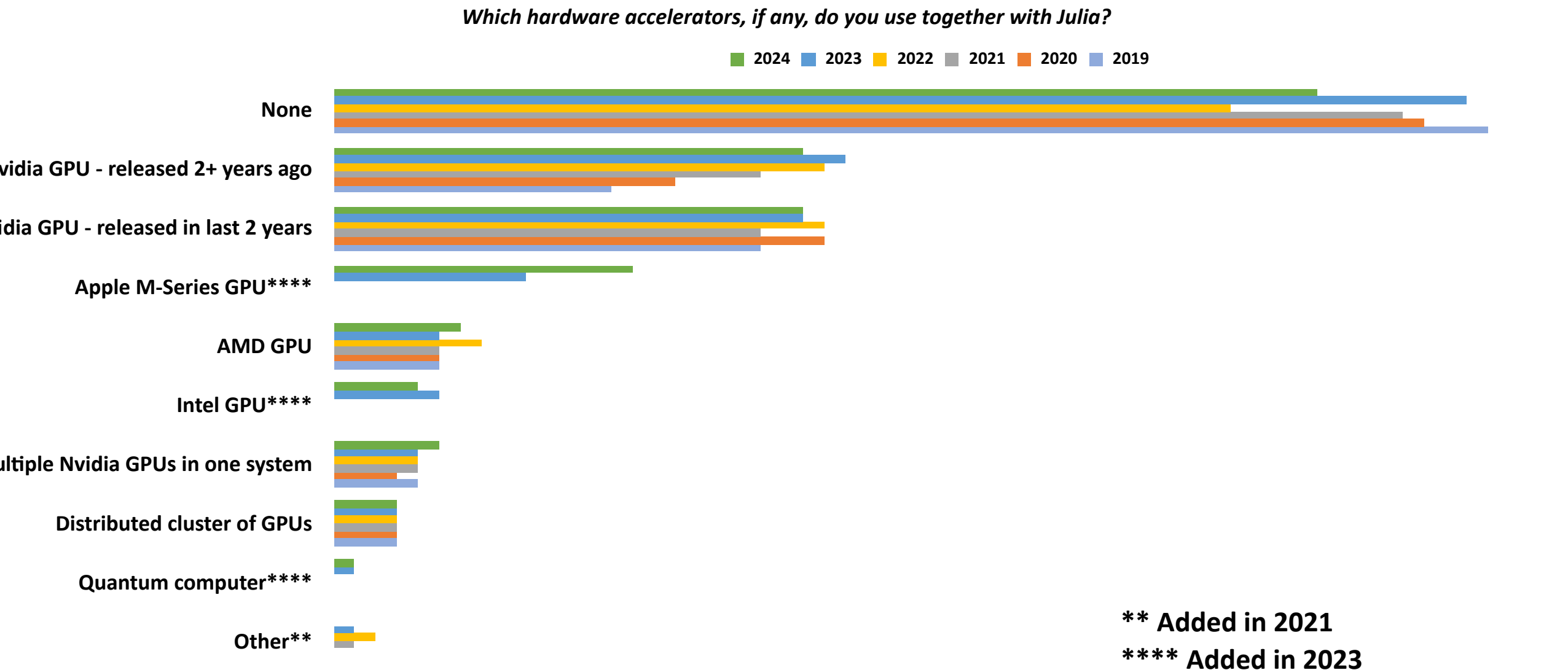


Most Use Julia Multi-Threading (Threads)

Which kind of parallelism, if any, do you use together with Julia?

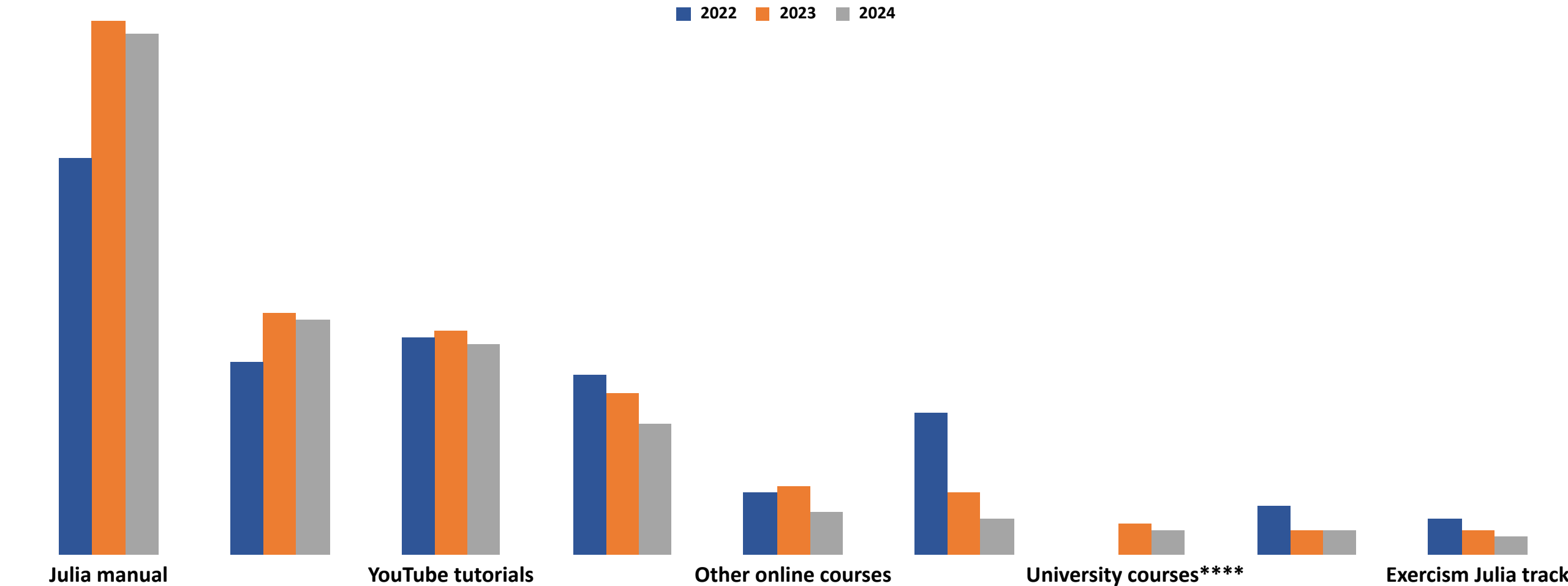


Nvidia GPUs Are the Most Common Accelerators



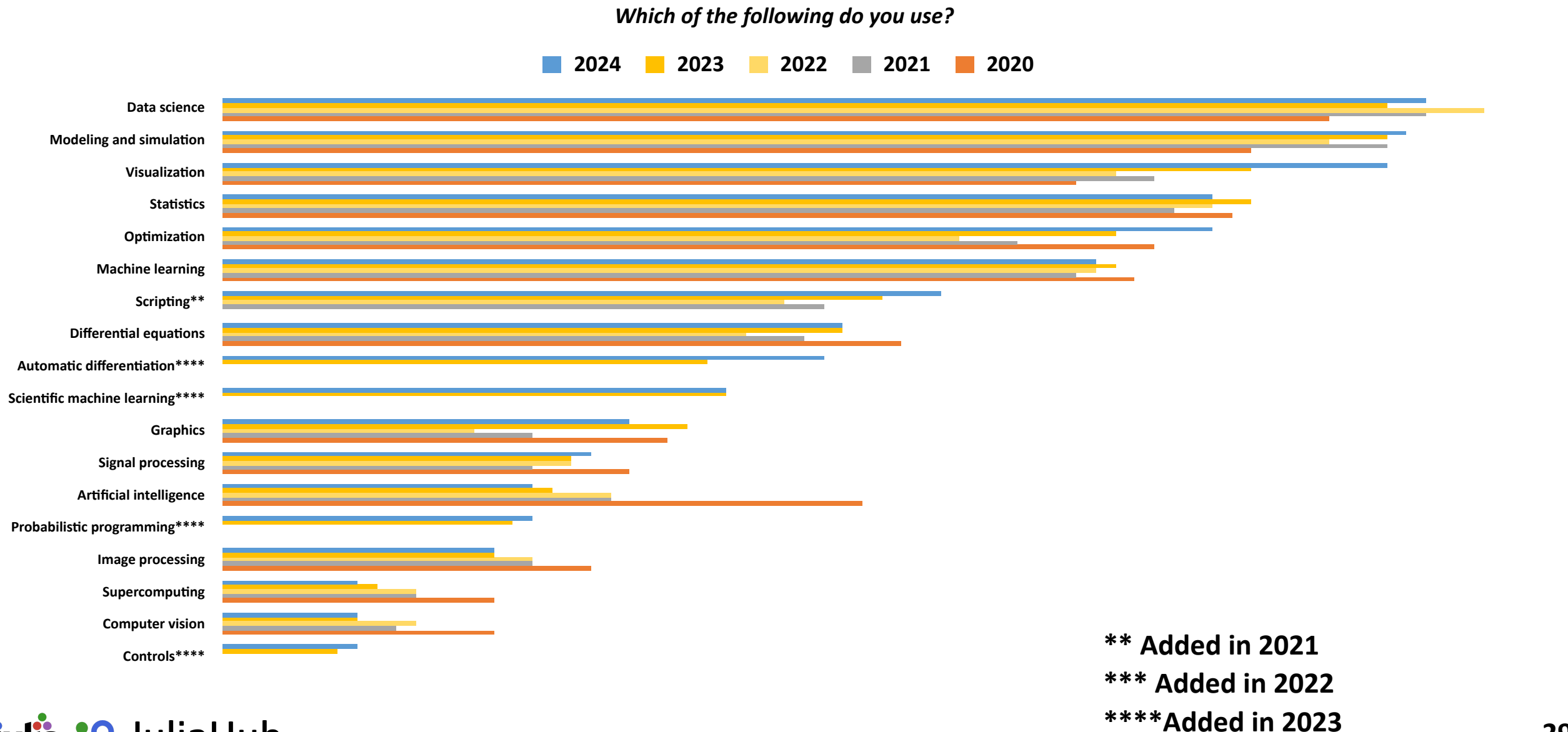
Julia Manual Is Most Useful for Learning Julia, Followed by JuliaCon Presentations, YouTube and Julia Books

What resources have you found most useful when learning Julia for the first time or when learning how to do something in Julia? Please select all that apply.



**** Online and in-person university courses combined in 2023

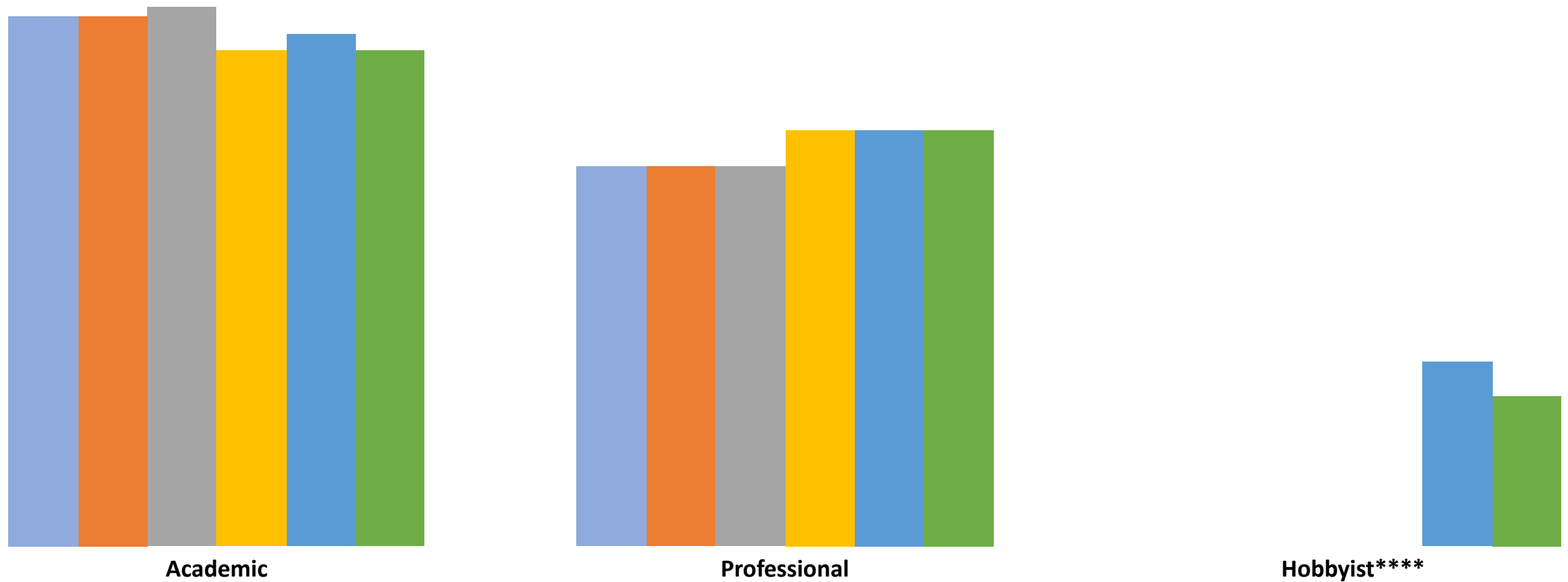
Most Respondents Use Data Science, Modeling and Simulation, Visualization, Statistics and Optimization



Professionals Are Nearly Half of Survey Respondents

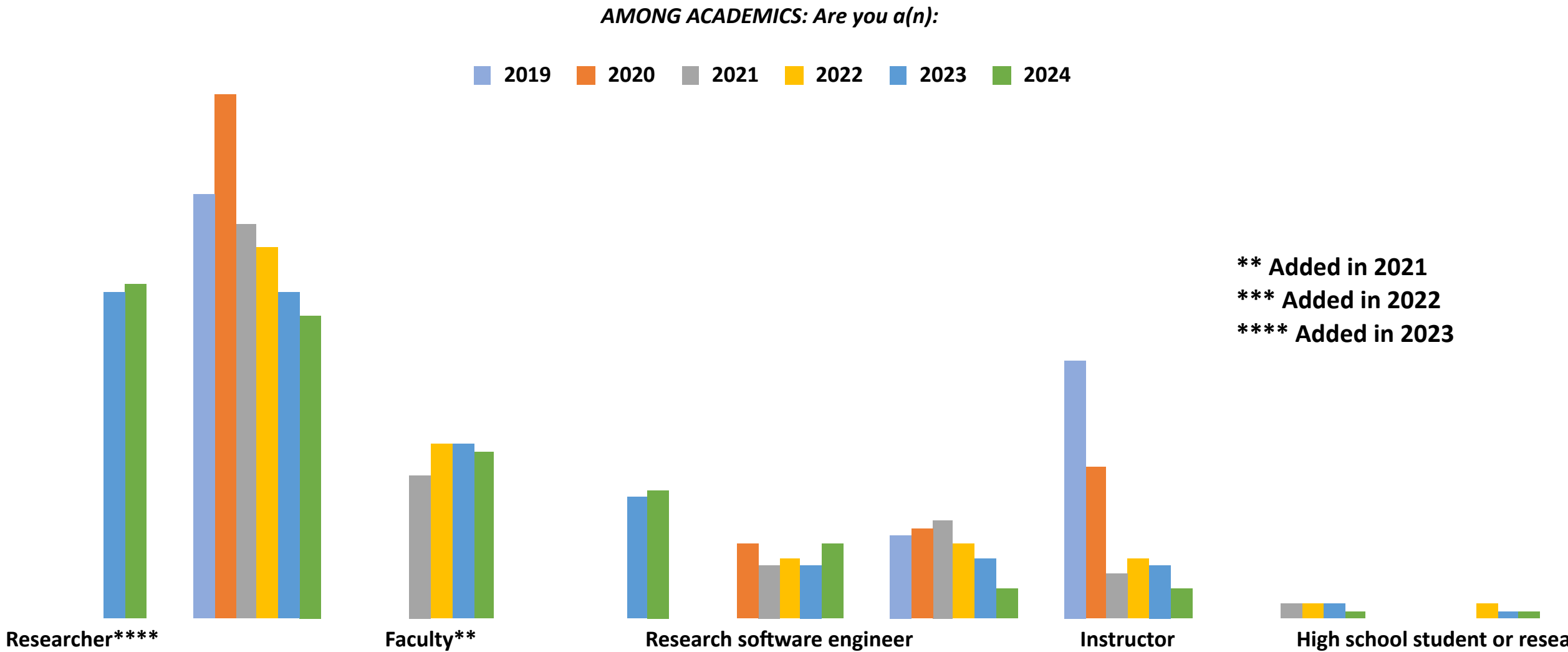
Which of the following best describes you? Please select all that apply.

2019 2020 2021 2022 2023 2024

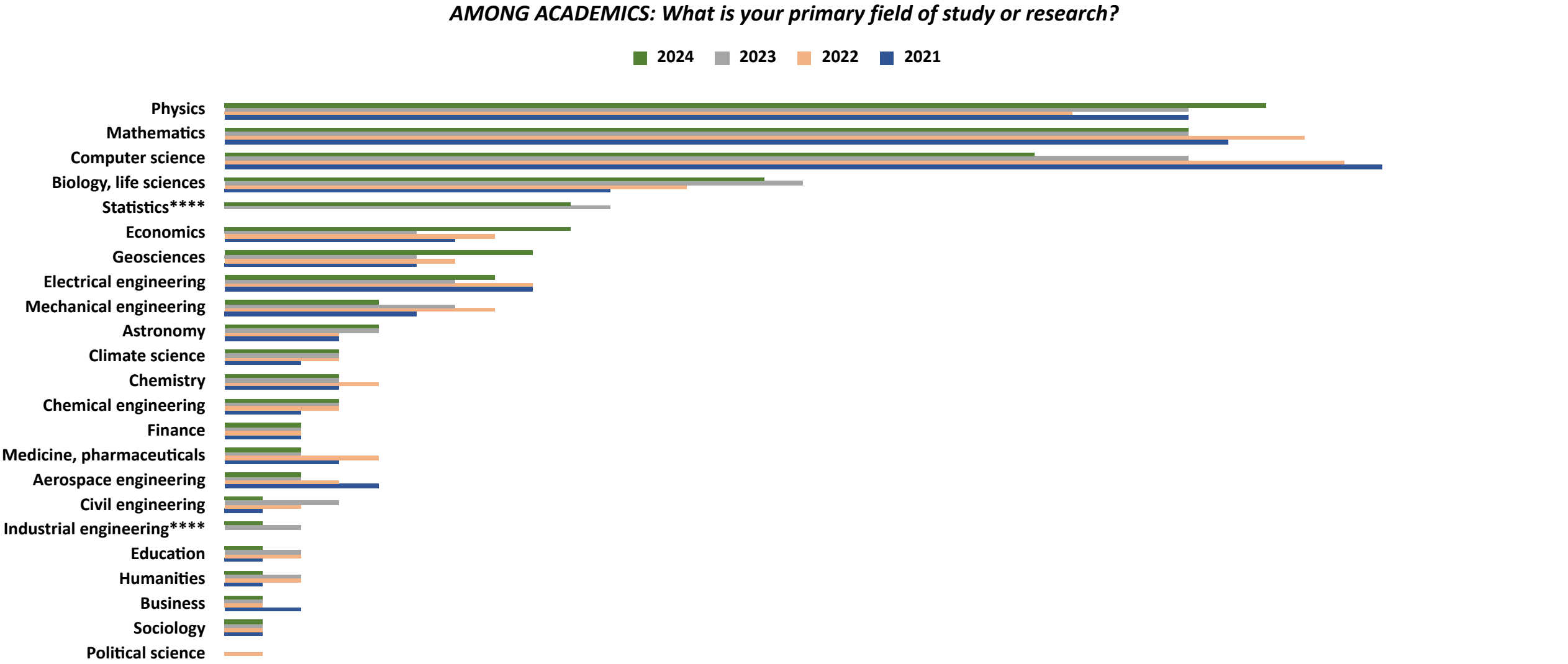


****Added in 2023

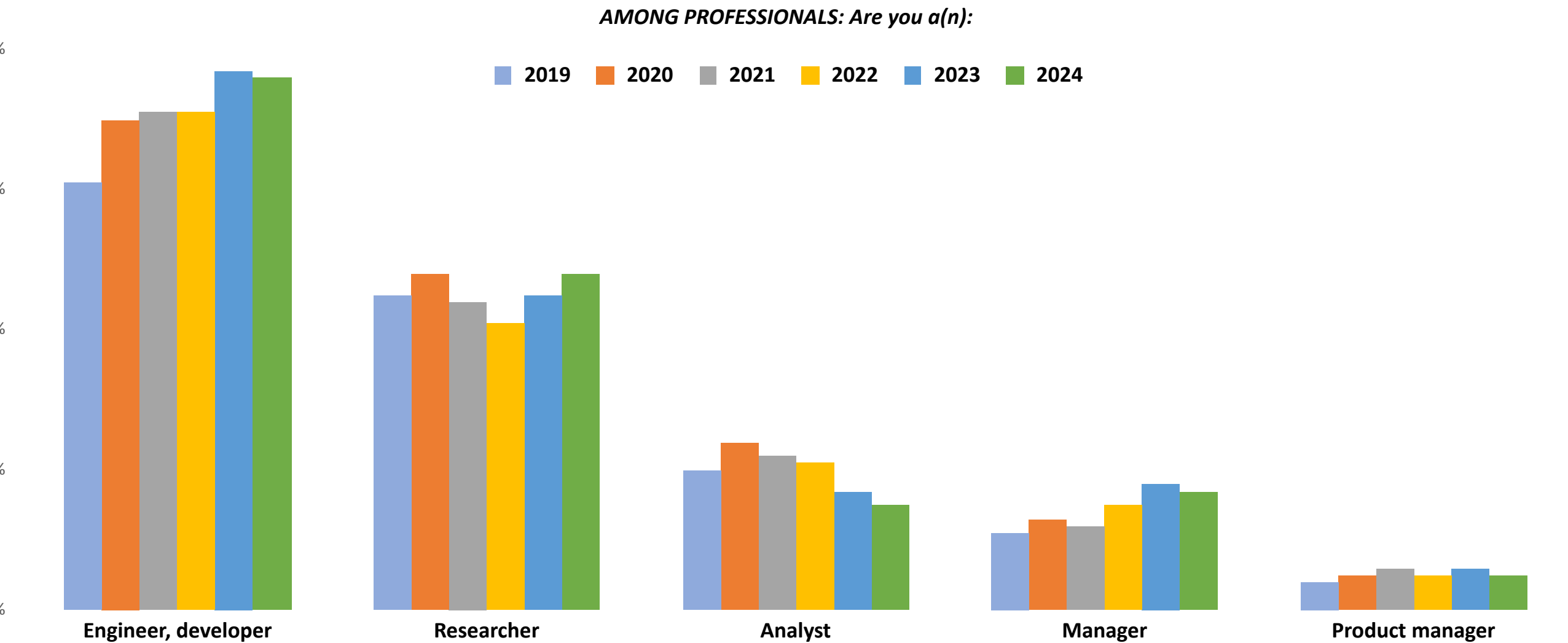
Among Academics, Most Respondents Are Researchers, Graduate or Postgraduate Students or Researchers



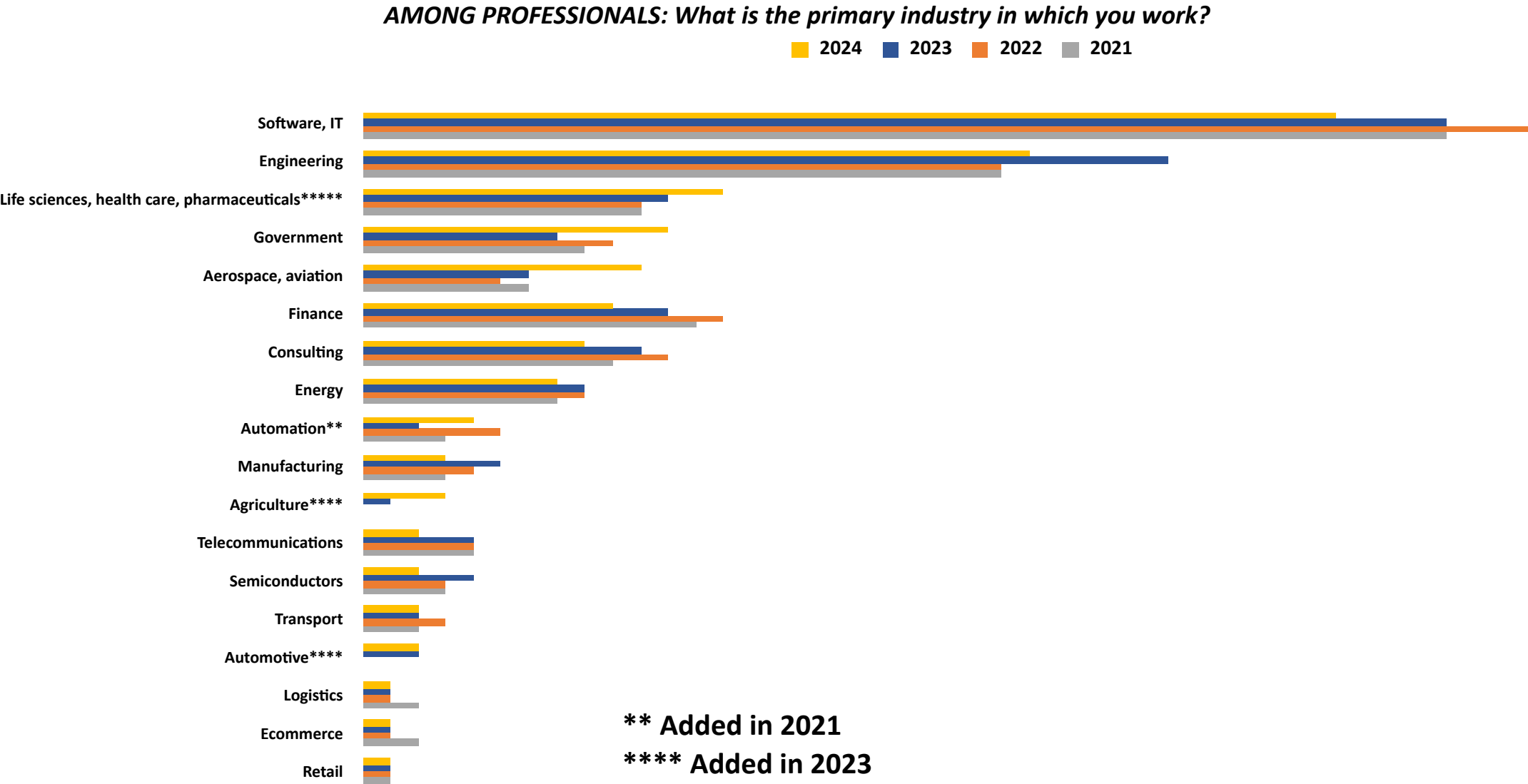
Among Academics, the Most Common Fields Are Physics, Mathematics and Computer Science



Among Professionals, Most Respondents Are Engineers or Developers



Among Professionals, the Most Common Industries Include Software, IT and Engineering

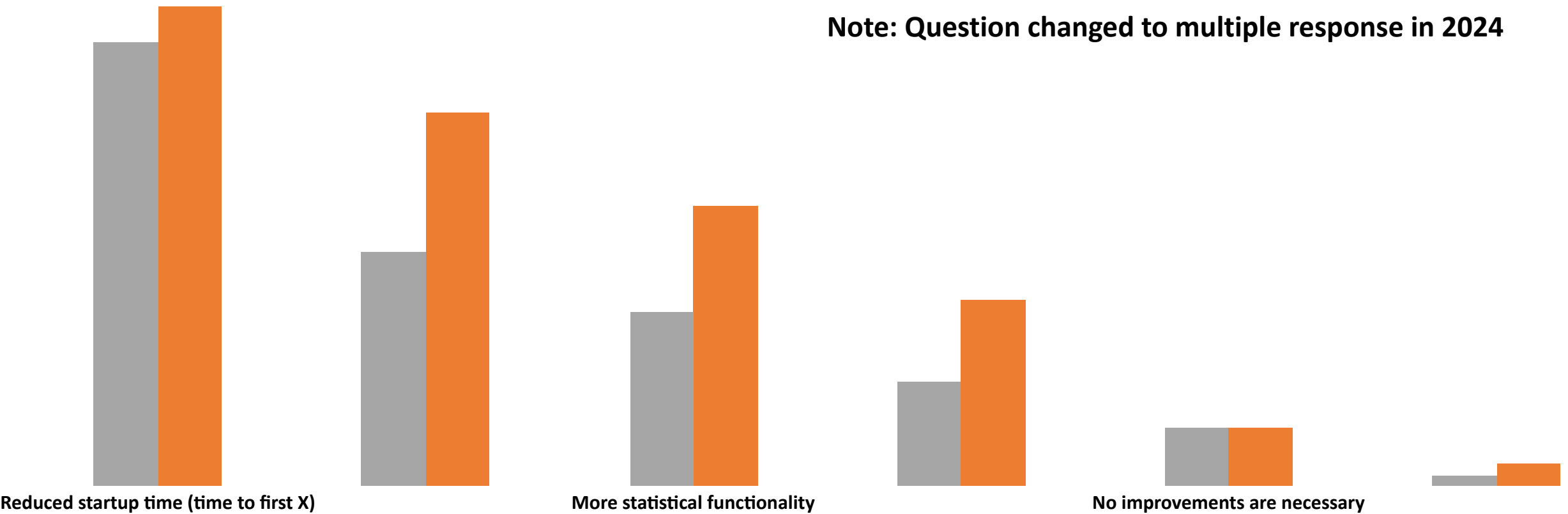


Julia Users Would Be More Likely to Recommend Julia if Startup Time Is Reduced

What type of improvements to Julia would make you more likely to recommend Julia to other people?

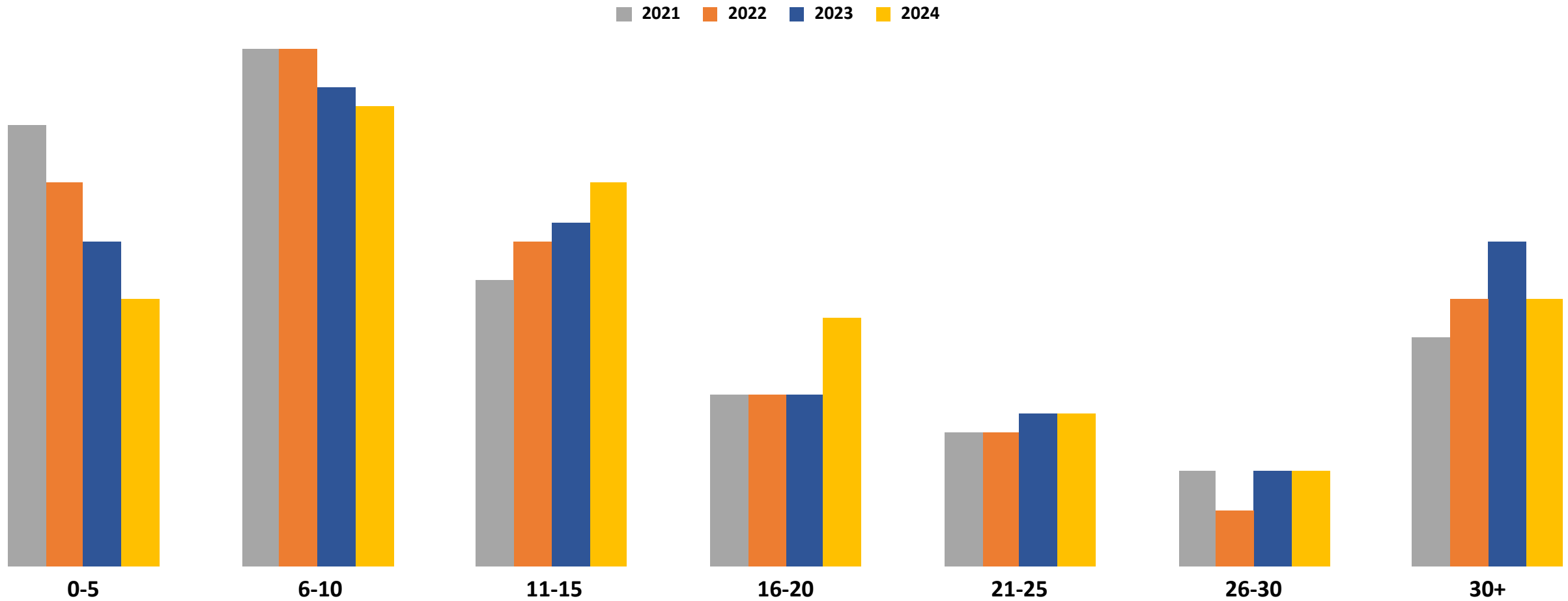
■ 2023 ■ 2024

Note: Question changed to multiple response in 2024

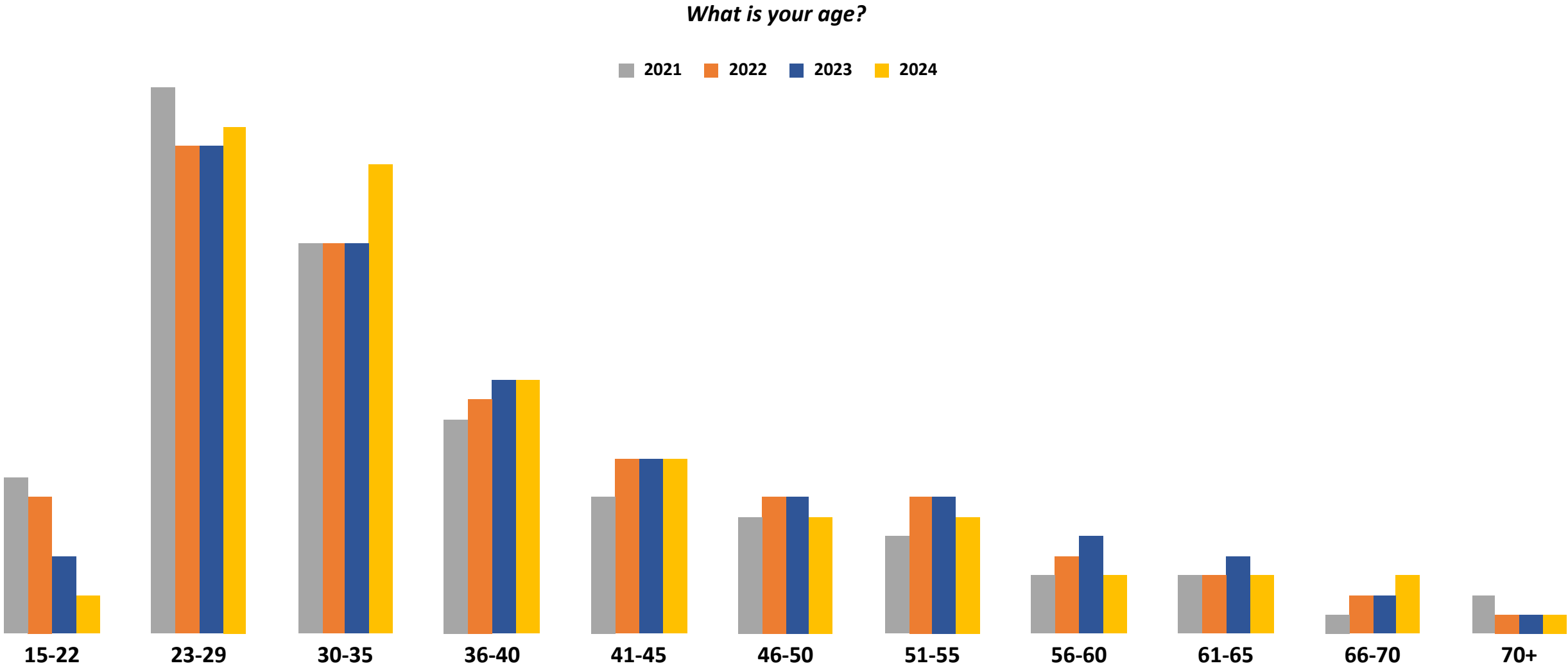


More Julia Users & Developers Have 11-20 Years Coding Experience; Fewer Have Less than 10 Years Experience

How many years of coding experience do you have?



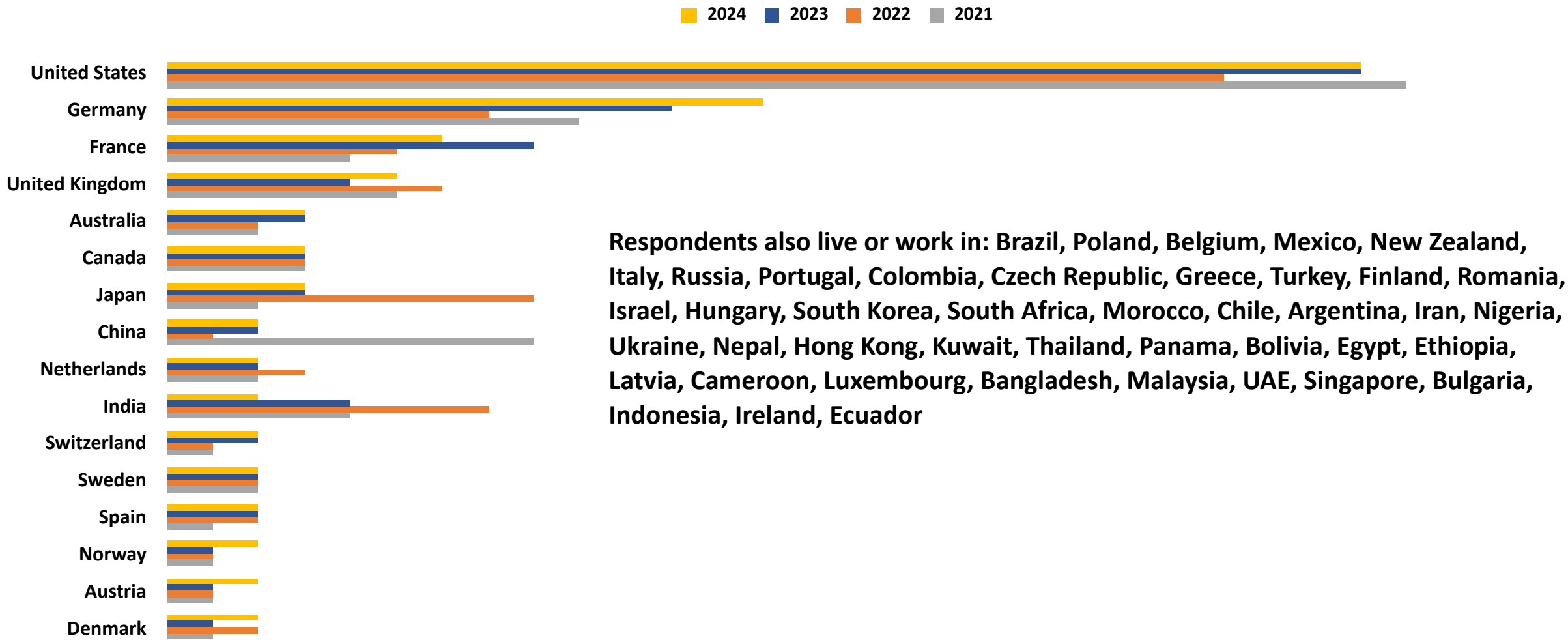
More Julia Users & Developers Are Age 23-35



Respondents Live or Work in Nearly 60 Countries and Regions

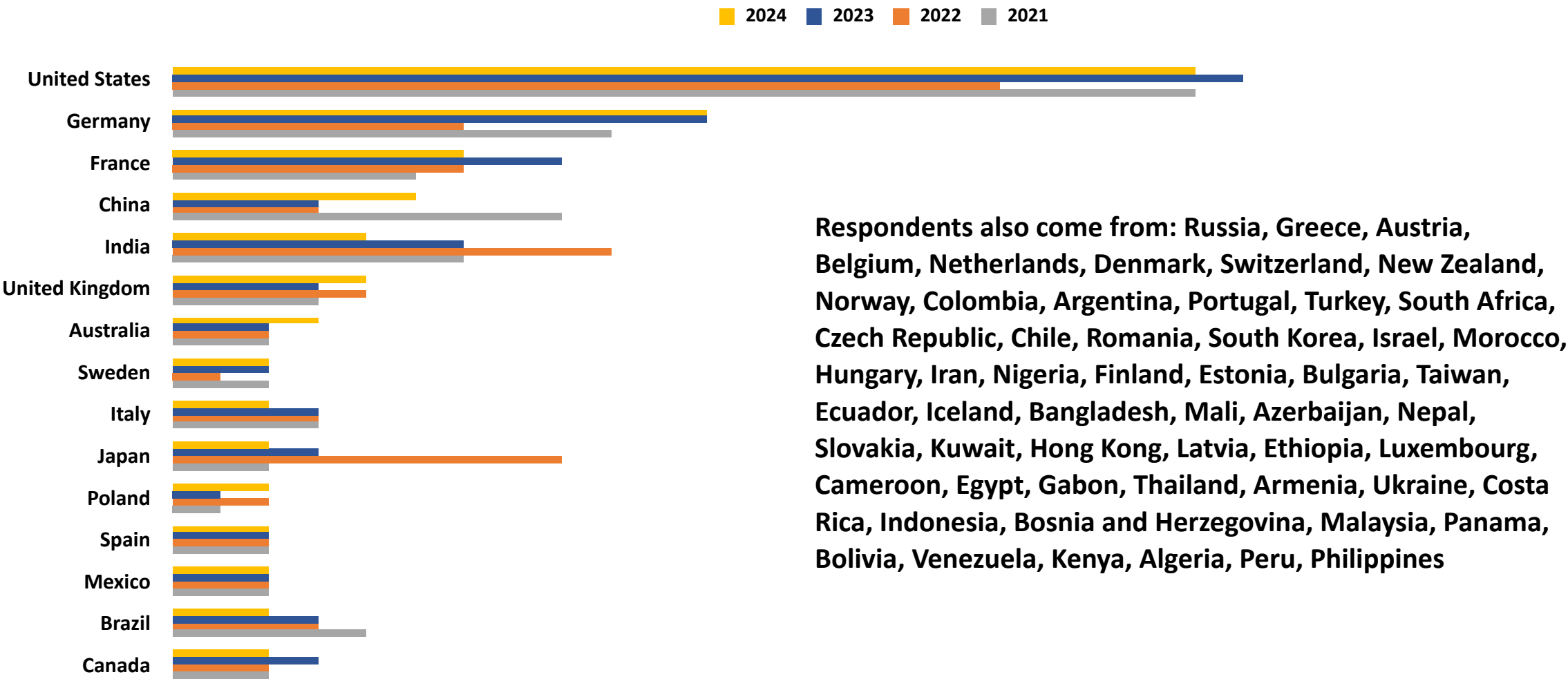
Germany Shows Most Growth

What is the country or region where you currently live or work?

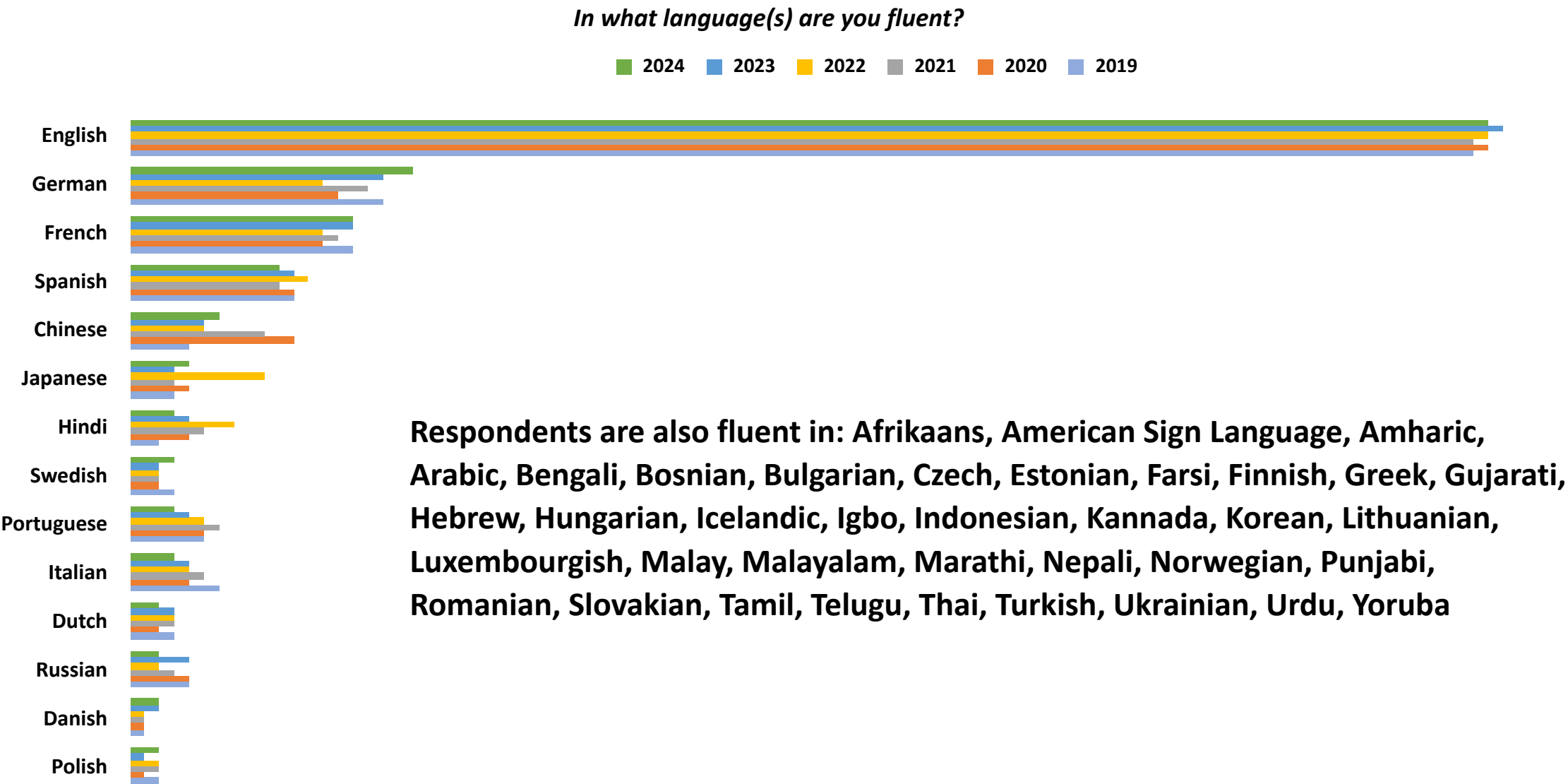


Respondents Come from More than 70 Countries and Regions

What is the country or region where you are originally from?



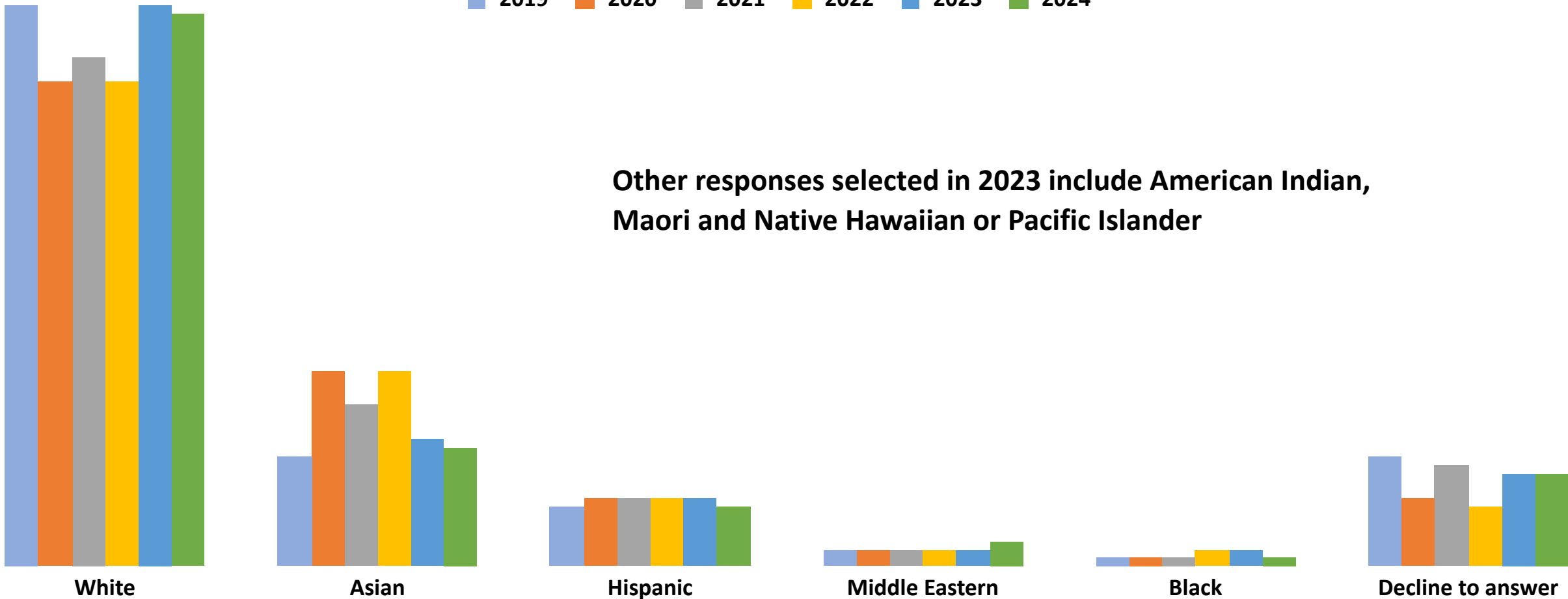
Respondents Are Fluent in More than 50 Languages



Most Respondents Are White or Asian

Which of the following best describes your race or ethnicity?

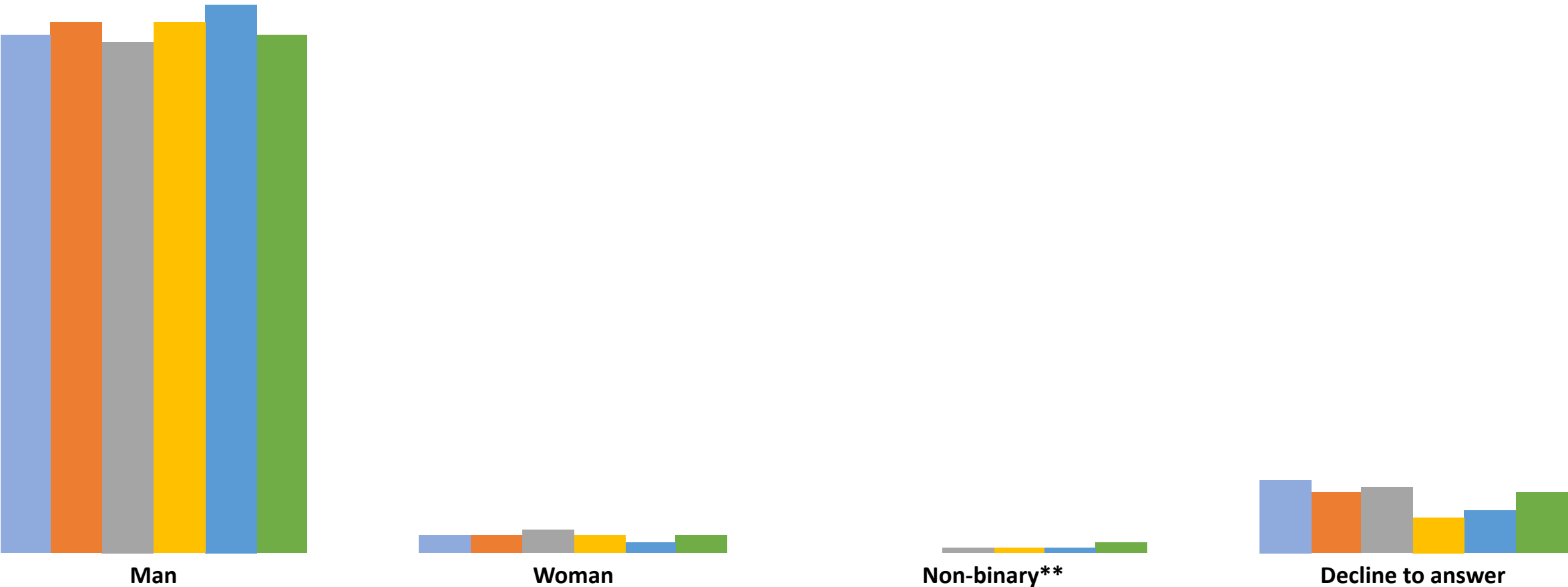
2019 2020 2021 2022 2023 2024



85% Identify as Men, 3% Identify as Women, 2% as Non-Binary and 10% Decline to Answer

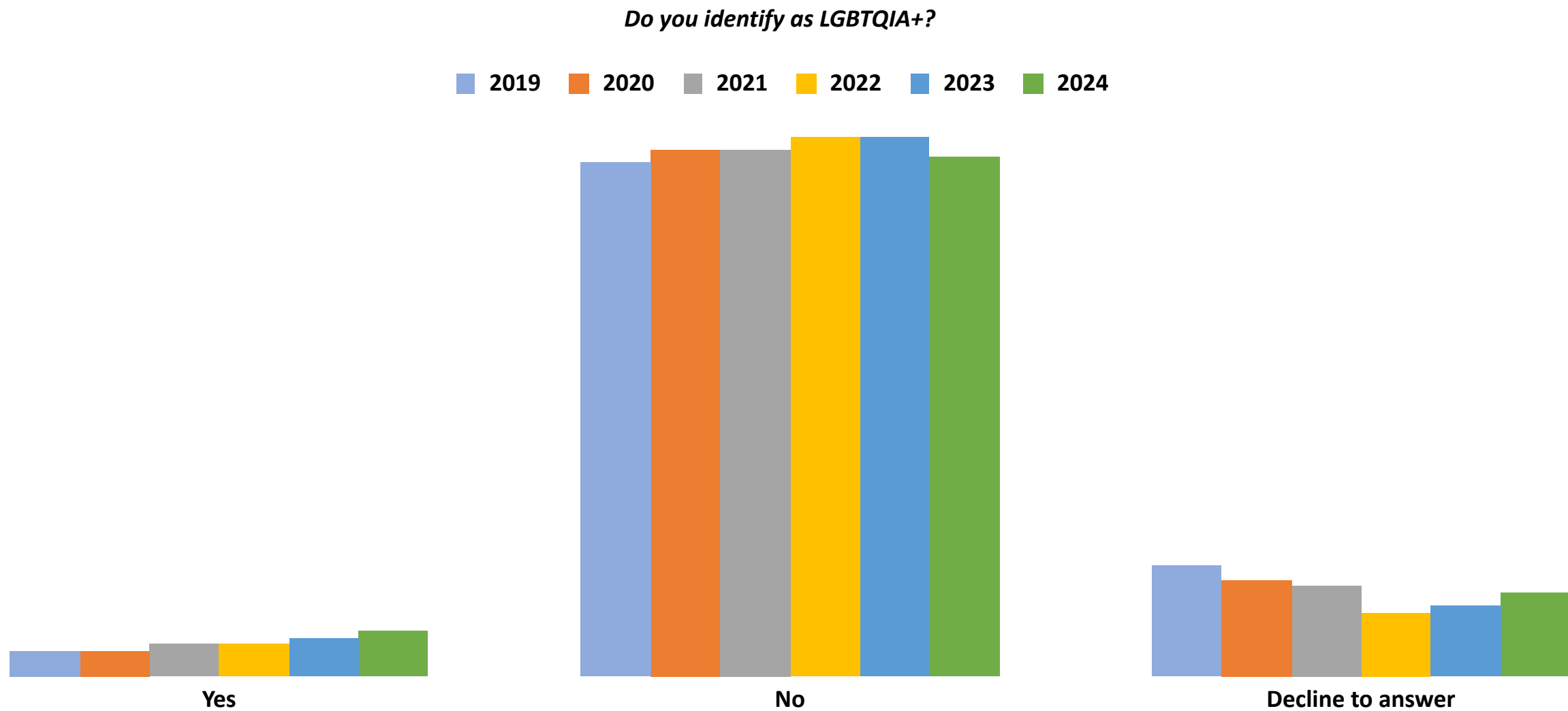
Which of the following best describes how you identify?

2019 2020 2021 2022 2023 2024



** Added in 2021

7% Identify as LGBTQIA+, Up From 4% in 2020



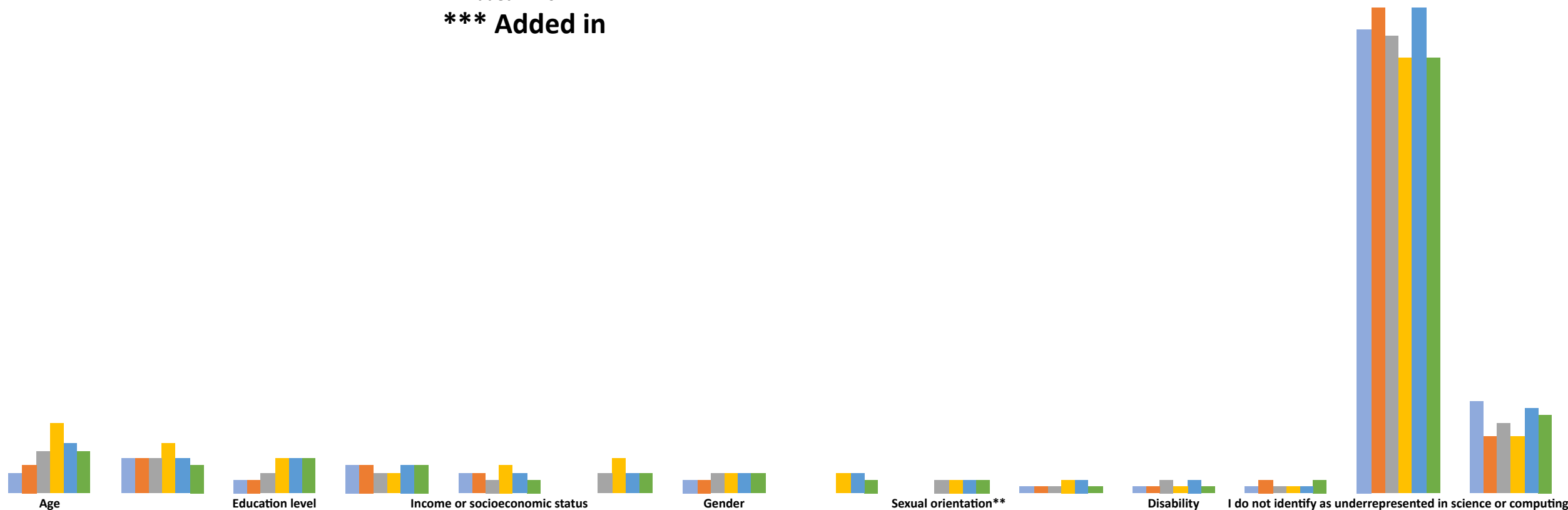
19% Identify as Underrepresented in Science or Computing

Do you identify as underrepresented in science or computing because of your:

2019 2020 2021 2022 2023 2024

** Added in 2021

*** Added in



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