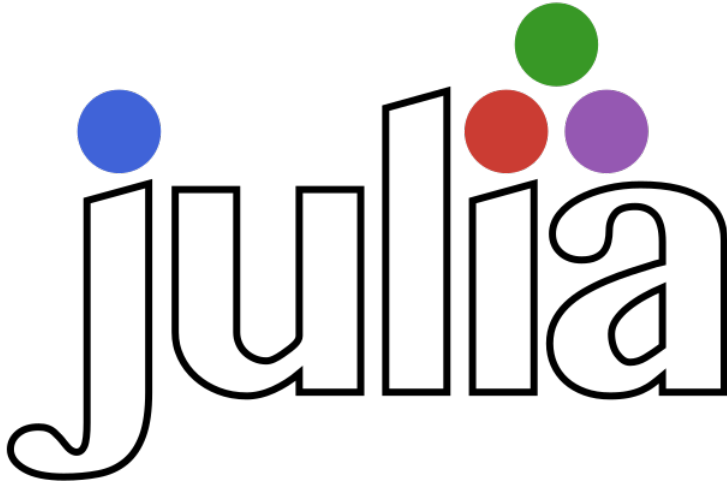Presentación

Programación en Julia: Primeros pasos

**Benjamín Pérez**

Héctor Medel

¿Qué es Julia?

- Julia es un lenguaje de programación relativamente nuevo.
- Fue creado por Jeff Bezanson, Stefan Karpinski, Viral B. Shah, y Alan Edelman en 2009 pero se liberó hasta el 2012 por primera vez.
- Nació para usarlo principalmente en computación científica, Machine Learning y Data Mining. Sin embargo, ahora podemos decir que es un lenguaje multipropósito.
- Es un lenguaje con sintaxis sencilla pero poderoso como C o Fortran.
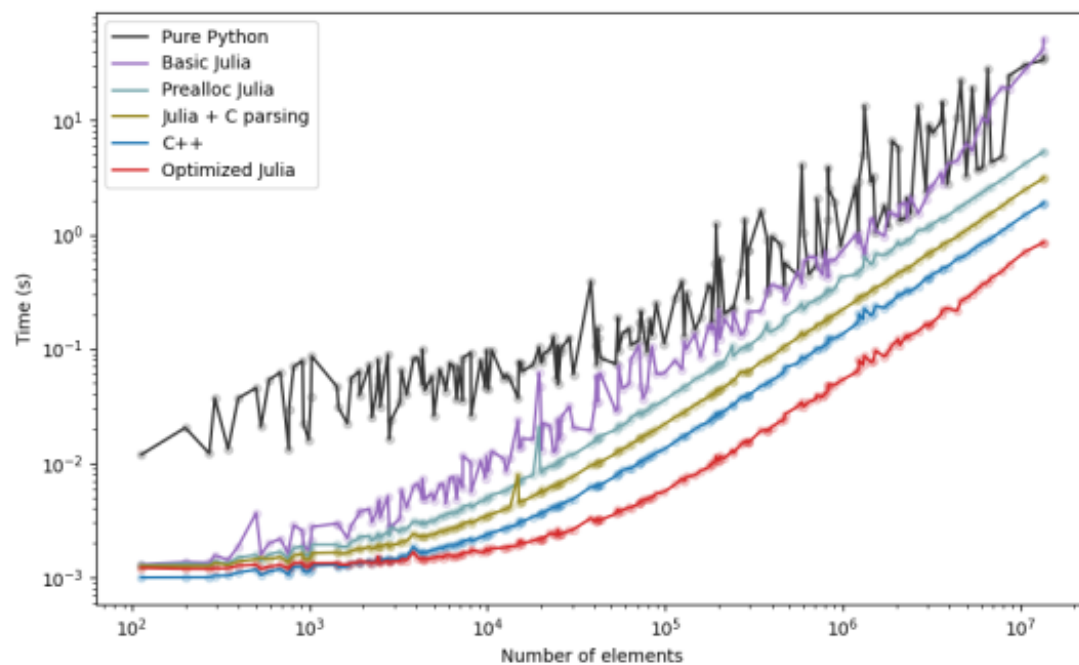
De ahí frases como:

… walks like Python, runs like C

Julia is not fast Python

- Julia es rápido, tanto como C (si se programa bien)
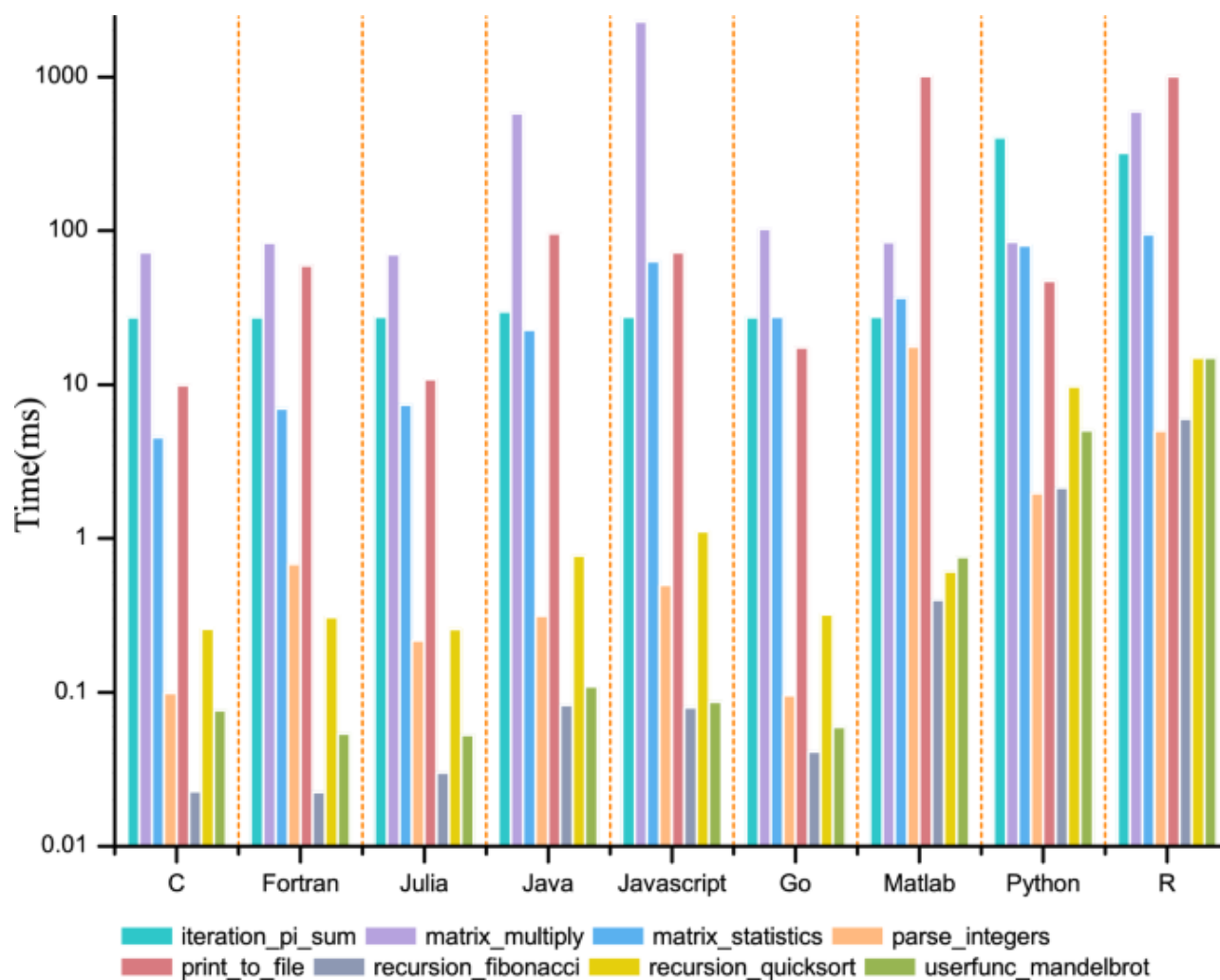
... y ¿si no se programa bien?

¿Cuáles son las ventajas de Julia?

- Tiene buen desempeño
- Es JIT (Just-In-Time) compilado
- Tiene sintaxis clara y de alto nivel
- Es versatil
- Es completamente gratis y software libre (Licencia MIT)
- No es necesario vectorizar, está optimizado en su diseño
- Diseñado para ser paralelizado y para cómputo distribuido
- Llama funciones de C y Fortran de manera natural
- Está ganando terreno y se está volviendo popular

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Julia language cracks top 20 in Tiobe popularity index

Qualities such as speed and scalability make Julia an attractive alternative to Python, R, and MATLAB for data science and mathematical computation, Tiobe said.

By Paul Krill
Editor at Large, InfoWorld | AUG 7, 2023 1:31 PM PDT

¿Dónde se está usando?

En particular, ha demostrado excelentes resultados en:

- Computación numérica
- Machine Learning
- Estadística
- Programación en general
- Desarrollo Web

En la industría

- Desarrollo y modelado farmaceutico
- Súper cómputo paralelo
- Modelación financiera
- Robótica
- Seguridad

Adoption   [edit]

Julia has been adopted at many universities including MIT, Stanford, UC Berkeley and the University of Cape Town. Large private firms across many sectors have adopted the language including Amazon, IBM, JP Morgan AI Research,[138] and ASML. Julia has also been used by government agencies including NASA and the FAA, as well as every US national energy laboratory.[139][140]

Scientific computing and engineering   [edit]

- Amazon, for quantum computing[141] and machine learning through Amazon SageMaker[142]
- ASML, for hard real-time programming with their machines[143]
- The Climate Modeling Alliance[144] for climate change modeling[145]
- CERN, to analyze data from the Large Hadron Collider (LHCb experiment)[146][147][148][149][150][151]
- NASA and the Jet Propulsion Laboratory use Julia to model spacecraft separation dynamics,[152][153][154] analyze TRAPPIST exoplanet datasets,[155][156] and analyze cosmic microwave background data from the Big Bang[157]
- The Brazilian INPE, for space missions and satellite simulations[158]
- Embedded hardware to plan and execute flight of autonomous U.S. Air Force Research Laboratory VTOL drones[159]

Pharmaceuticals and drug development   [edit]

Julia is widely used for drug development in the pharmaceutical industry, having been adopted by Moderna, Pfizer, AstraZeneca, Procter & Gamble, and United Therapeutics.[160][161]

Economics, finance, and political science   [edit]

- The Federal Reserve Bank of New York, for macroeconomic modeling in Julia since 2015, including estimates of COVID-19 shocks in 2021[162]
- Also the Bank of Canada, central bank, for macroeconomic modeling[163]
- BlackRock, the world's largest asset manager, for financial time-series analysis[164]
- Aviva, the UK's largest general insurer, for actuarial calculations[164]
- Mitre Corporation, for verification of published election results[165]
- Nobel laureate Thomas J. Sargent, for macroeconometric modeling[166]

Tomado de Wikipedia

Comencemos