

Giselle Reis - Programming Languages Research Notes

1. Why did we move from punch cards to programming languages? What does that tell you about the purpose of programming languages?

Punch cards were hard to debug; if one card was wrong, you had to go through the whole stack, which wasted hours. However, programming languages enable humans to write more readable code and it's easier for compilers to do the machine translation.

2. There are hundreds of different programming languages out there. Why do you think we need so many? They each serve different purposes and have their own pros and cons. Some languages have better speed (C), others readability (Python), safety (Rust), or domain focus (SQL for databases). Since no single language works best for everything, we need many.

3. What are some drawbacks of a programming language you use? How would you like it to be different? Think of specific examples.

I primarily use Python, which can be a bit slower compared to compiled languages and has the Global Interpreter Lock, which limits multithreading. It's also dynamically typed, so type errors show up at runtime, adding optional static typing or improved concurrency would make it better.

4. If you were going to create a new programming language, how would you start? What do you need to define?

I would start by defining the goals and the function I want my programming language to be good at performing. I'd probably make it math-friendly since that's what I'd use it for. Then I would think about the syntax and semantics of the language. Finally, I would implement a compiler or interpreter so the computer can run the code written in it.

Sources

<https://spectrum.ieee.org/from-punch-cards-to-python>

<https://www.freecodecamp.org/news/why-are-there-so-many-programming-languages>

<https://www.pixelcrayons.com/blog/software-development/python-pros-and-cons/>