

NNSA HSAP Computational Laboratory 1 - 2026 Update

Introductions: Name, high school, favorite subject.

Does anyone speak more than one language?

Why is being multilingual useful?

Just as learning other human languages is beneficial- you can communicate with more people- learning a programming language allows you to communicate with, and use, computers.

There are similarities and differences. For most people, human language is first learned verbally- a child talks before reading or writing. Although there is increasing verbal communication with computers (Alexa, etc) most of the time we communicate with computers by writing/typing at a keyboard.

There are *many* programming languages, and their popularity waxes and wanes as time goes by. Different languages might be better for one task or another, e.g. for scientific/engineering codes, for website development, for statistical analysis, etc. Other language choice considerations are ease of use and execution speed. These might be at variance with each other.

One piece of good news: learning a programming language gets much easier once you know a first language, because many basic ideas: declaring variables, loops, arrays, if-then statements, functions, etc are the same. Each computer language has its own vocabulary, but the concepts are largely the same.

Era	Dominant Languages
1960s-1980s	Fortran (' F ormula T ranslation')
1990s	C, C++, Visual Basic, Perl
Early 2000s	Java, C++, C
2010s	Java, C, C++, Python, JavaScript
2020s	Python, JavaScript, Java, C/C++, TypeScript, Rust
Mid-2020s	Python dominant in education, AI, and scientific computing

Language popularity changes with technology:

- **Fortran** dominated scientific computing in the 1960s-1980s.
- **C** and **C++** grew with operating systems and systems software.
- **Java** surged with the internet and enterprise computing in the 2000s.
- **JavaScript** rose because of the web.
- **Python** exploded because of data science, machine learning, and its ease of learning. It now has roughly 40-50% popularity share.

There are 16 workstations in this computer lab: shull, waals, lamb, taylor, friedman, hertz, kendall, ramsey, kusch, born, bloch, zernike, moessbauer, segre, cherenkov, glaser.

Do you need to sit at the same computer every time you use the lab?