

CSCI 325 Organization of Programming Languages

Spring 2015

Why a Programming Language Course?

- CSCI 325 is not about learning a programming language
- CSCI 325 is about the design and implementation of programming languages

Why Do We Need Programming Languages?

- It is all about abstraction and increasing programmer productivity
- Abstraction is “Information Hiding”

Why Do We Need Programming Languages?

- Computers are numeric machines
- They “speak” numbers
- Hard for humans to “speak” numbers
- Slow and inefficient to program

Why Do We Need Programming Languages

- Assembly language uses mnemonics
- Simple “text “ that represents an instruction
- Easier to remember than numbers
- Assemblers convert assembly instructions to numeric machine codes

Why Do We Need Programming Languages?

- Assembly language abstracts numeric machine code
- Programmers can be more productive

Why Do We Need Programming Languages?

- Limit to number of instructions a programmer can write in one day
- How to increase productivity?
- Need more powerful abstraction mechanisms

Why Do We Need Programming Languages?

- Program languages provide “human readable” constructs that abstract multiple machine instructions
- More “powerful” program language constructs abstract more details and instructions

Why Do We Need Programming Languages?

- New programming paradigms introduce even more powerful programming language constructs
- For Example
 - Object-Oriented languages
 - Programming-Markup hybrid languages

Why Learn About Programming Languages?

- Easier to learn new languages
- Easier to evaluate the suitability of a language for a particular problem domain
- Can make you a better programmer

Learn New Languages

- Languages are constantly being developed
- Languages evolve with similar constructs
Algol → Pascal → C → many current languages
C++ → Java → C#
- If you know Object-Oriented constructs, it is easier to learn Java or C#

Programming Domains

- Many domains: Scientific, Business, Office, Artificial Intelligence, Symbolic, Systems, Networking, Embedded, Web, etc.
- What language is best for a particular domain?
- Is one language suitable for all domains?

Better Programmer

- Better understanding of the implementation leads to more intelligent use of the language
- Studying programming languages allows you to learn and quickly use features that were previously unknown