

## Chapter 2

# Evolution of the Major Programming Languages

### 2.1 Zuse's Plankalkul

### 2.2 Minimal Hardware Programming : Pseudocodes

### 2.3 THE IBM 704 and **FORTRAN**

### 2.4 Functional Programming : **LISP**

### 2.5 The First Step Toward Sophistication : **ALGOL60**

### 2.6 Computerizing Business Record : **COBOL**

### 2.7 The Begining of Timesharing : **BASIC**

### 2.8 Everything for Everyone : **PL/I**

### 2.9 The beginning of Data Abstraction : **SIMULA67**

### 2.10 Orthogonal Design : **ALGOL68**

### 2.11 Two Important Descendants of the ALGOLs : **Pascal** and **C**

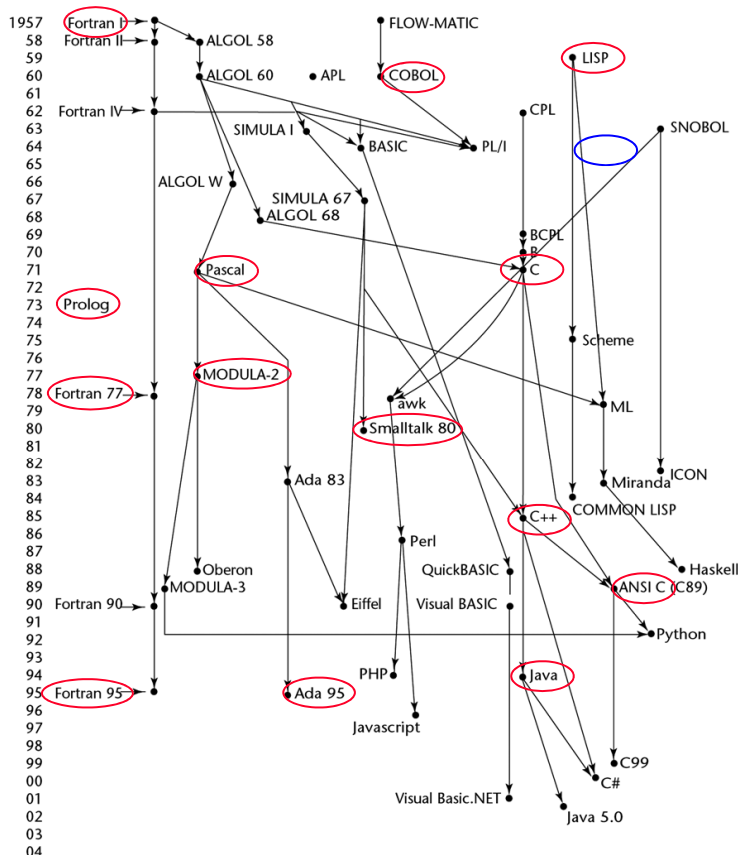
### 2.12 Programming Based on Logic : **Prolog**

### 2.13 History's Largest Design Efforts : **Ada**

### 2.14 Object-Oriented Programming : Smalltalk

### 2.15 Combining Imperative and Object-Oriented Features : **C++**

## • Genealogy of High-Level Programming Languages



**<Homework 1>**  
**Solve the Problems**  
**#7, #12, #14**

7. LISP began as a pure functional language but gradually acquired more and more imperative features. Why?

12. Describe, in your own words, the concept of orthogonality in programming language design.

14. What are the arguments both for and against the idea of a typeless language?

Figure 2.1 Genealogy of common high-level programming languages

- **TIOBE Programming Community Index for Feb. 2016**
  - [http://www.tiobe.com/tiobe\\_index](http://www.tiobe.com/tiobe_index)
  - gives an indication of the popularity of programming languages.
    - ⇒ is updated once a month.
  - The ratings are based on the world-wide availability of skilled engineers, courses and third party vendors

Feb 2016	Feb 2015	Change	Programming Language	Ratings	Change
1	2	▲	Java	21.145%	+5.80%
2	1	▼	C	15.594%	-0.89%
3	3		C++	6.907%	+0.29%
4	5	▲	C#	4.400%	-1.34%
5	8	▲	Python	4.180%	+1.30%
6	7	▲	PHP	2.770%	-0.40%
7	9	▲	Visual Basic .NET	2.454%	+0.43%
8	12	▲	Perl	2.251%	+0.86%
9	6	▼	JavaScript	2.201%	-1.31%
10	11	▲	Delphi/Object Pascal	2.163%	+0.59%
11	20	▲	Ruby	2.053%	+1.18%
12	10	▼	Visual Basic	1.855%	+0.14%
13	26	▲	Assembly language	1.828%	+1.08%
14	4	▼	Objective-C	1.403%	-4.62%
15	30	▲	D	1.391%	+0.77%
16	27	▲	Swift	1.375%	+0.65%
17	18	▲	R	1.192%	+0.23%
18	17	▼	MATLAB	1.091%	+0.06%
19	13	▼	PL/SQL	1.062%	-0.20%
20	33	▲	Groovy	1.012%	+0.51%