**Name: Brihat Ratna Bajracharya**

**Roll No.: 19/075**

**Assignment #1 (Principles of Programming Languages)**

# History of Development of Programming Languages

The development of different programming languages are shown in following table in chronological order with following details:

**Year** – Year of development / first release in AD

**Name** – Name of the programming language

**Source** – Developer / Designer of the programming language (company name in braces)

**Remark** – Distinct Features, Use cases, Application areas and / or other information

**Tags** – Domains in which the programming language belongs to (one programming language can have multiple tags if they fit in multiple domains)

Also, table cell's background color is used to denote different time periods as specified in legend after the table. Various references consulted are listed in References section at the end of this document

| S. No. | *Year* | Name | Source | Remarks | Tags |
|---|---|---|---|---|---|
| 1 | *1883* | **Algorithm for Analytical Engine** | Ada Lovelace | First computer algorithm ever written | *Machine Code* |
| 2 | *1949* | **Assembly Language** | David J. Wheeler | Used in EDSAC by Maurice Wikes | *Assembly* |
| 3 | *1950* | **Short Code** | William F Schmitt, A. B. Tonik, J. R. Logan | One of the first higher-level languages ever developed for an electronic computer | *Interpreted* |
| 4 | *1952* | **Autocode and its compiler** | Alick Glennie | 1. Used in Mark 1 at University of Manchester<br>2. First compiled programming language | *Compiled* |

| 5 | 1957 | **ForTran (Formula Translation)** | John W. Backus (IBM) | 1. Oldest high level programming language.<br>2. Still used in world's fastest supercomputer<br>3. Other Programmers: Richard Goldberg, Sheldon F. Best, Harlan Herrick, Peter Sheridan, Roy Nutt, Robert Nelson, Irving Ziller, Harold Stern, Lois Haibt, and David Sayre | *Array Programming, Compiled, Numerical Analysis* |
|---|---|---|---|---|---|
| 6 | 1958 | **ALGOL (Algorithmic Language)** | committee of European and American computer scientists at the Swiss Federal Institute of Technology in Zurich | 1. Most influential early programming languages.<br>2. First language to inplement nested function definitions.<br>3. Basis for other languages like Pascal, C, C++, Java | *Compiled, Procedural* |
| 7 | 1959 | **COBOL (Common Business Oriented Language)** | Dr. Grace Murray Hopper (US DoD, CODASYL) | Partly based on FLOW-MATIC designed by Dr. Grace Murray Hopper | *Compiled* |
| 8 | 1959 | **Lisp (List Processing Language)** | MIT | 1. Second oldest high level programming language<br>2. Popular for study of AI during this time | *Compiled* |
| 9 | 1964 | **BASIC (Beginners' All-purpose Symbolic Instruction Code)** | John G. Kemeny, Thomas E. Kurtz | Designed for students | *Compiled, Procedural* |
| 10 | 1967 | **Logo** | Wally Feurzeig, Seymour Papert, Cynthia Solomon | 1. Educational programming language<br>2. Widely known for its use of turtle graphics, in which commands for movement and drawing produced line or vector graphics, either on screen or with a small robot termed a turtle | *Educational* |
| 11 | 1970 | **Pascal** | Niklaus Wirth | 1. Used in Apple's early software development<br>2. Encourages commenting (good programming | *Compiled, Educational* |

| | | | | structure) | |
|---|---|---|---|---|---|
| 12 | *1972* | **Small talk** | Alan Kay, Dan Ingalls, Adele Goldberg | Allows changing code on the fly | *Object Oriented, Scripting* |
| 13 | *1972* | C | Dennis Ritchie (Bell Labs) | 1. Widely used high level programming language<br>2. Still taught commonly throughout high level computer education | *Compiled, Procedural, System* |
| 14 | *1972* | **Prolog** | Alain Colmerauer, Robert Kowalski | 1. Logic programming language associated with artificial intelligence and computational linguistics<br>2. Used for theorem proving, expert systems, term rewriting, type systems, and automated planning as well as natural language processing | *Declarative* |
| 15 | *1972* | **SQL (Structured Query Language)** | Donald D. Chamberlin Raymond F. Boyce (IBM) | Widely used database query language | *Data oriented, Declarative (DQL only), Extension* |
| 16 | *1974* | **GRASS (GRAphics Symbiosis System)** | Tom DeFanti as a Phd Thesis Project | Created to script 2D vector graphics animations | |
| 17 | *1978* | **MATLAB (Matrix Laboratory)** | MathWorks | Advanced Mathematical Computation | *Array, Numerical Analysis* |
| 18 | *1980* | **Ada** | A team led by Jean Ichbiah | 1. Named after Ada Lovelace<br>2. Extended from Pascal<br>3. Strong typing, explicit concurrency, tasks, synchronous message passing, protected objects, and non-determinism | *Compiled, Concurrent, Procedural, System* |
| 19 | *1983* | **Objective C** | Tom Love and Brad Cox | 1. Combines Smalltalk messaging with C programming language<br>2. Main programming language for Apple's Mac OS and | *Compiled* |

| | | | | | iOS | |
|---|---|---|---|---|---|---|
| 20 | *1983* | **C++** | Bjarne Stroustrup | 1. "C with classes" <br> 2. Still continuous updates and new release | | *Compiled, Functional, Meta programming, Object Oriented, System* |
| 21 | *1983* | **VHDL (VHSIC (Very High Speed Integrated Circuit) – HDL (Hardware Description Language))** | IEEE | Hardware description language used in electronic design automation to describe digital and mixed-signal systems | | *Hardware Description* |
| 22 | *1986* | **Eiffel** | Bertrand Meyer (Eiffel Software) | Many concepts initially introduced by Eiffel later found their way into Java, C#, and other languages | | *Compiled, Concurrent* |
| 23 | *1987* | **Perl** | Larry Wall | 1. Designed as scripting language for text editing <br> 2. Based on C, BASIC and Lisp <br> 3. Commonly used in Linux System Administration, Network Programming and Web Development | | *Extension, Functional, Procedural, Scripting* |
| 24 | *1989* | **GNU Bash** | Brian Fox | Unix shell and command language | | *CLI* |
| 25 | *1990* | **Haskell** | | 1. Intense Mathematical Calculation <br> 2. Pure Functional Language | | *Compiled, Concurrent, Functional* |
| 26 | *1991* | **Python** | Guido van Rossum | 1. Interpreted, high-level and general-purpose programming language <br> 2. Most favourite language for data science projects | | *Embedded, Educational, Extension, Functional, Interpreted, Meta programming, Object Oriented, Scripting* |
| 27 | *1991* | **Visual Basic** | Microsoft | | | *Compiled, Procedural* |
| 28 | *1993* | **R** | Ross Ihaka and Robert Gentleman (University of Auckland, NZ) | 1. Foundation for Statistical Computing <br> 2. Widely used among statisticians and data miners for developing statistical software | | *Array, Numerical Analysis, Scripting* |

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|---|---|---|---|---|---|
| 29 | 1995 | **Java** | James Gosling (Sun Microsystems, now Oracle Corporation) | Write Once Run Anywhere (WORA) | *Compiled, Concurrent, Functional, Object Oriented* |
| 30 | 1995 | **Php (personal home page)** | Rasmus Lerdorf | Mostly used in web development, best example WordPress is written in php | *Embedded, Scripting* |
| 31 | 1995 | **Ruby** | Yukihiro Matsumoto | Features dynamic typing and garbage collection | *Embedded, Extension, Functional* |
| 32 | 1995 | **JS (JavaScript)** | Brendan Eich | 1. Focuses on enhancing web browser interactions<br>2. Just-In-Time compiled<br>3. Used along with HTML and CSS for the WWW | *Embedded, Extension, Interpreted, Scripting* |
| 33 | 2000 | **C#** | Microsoft | 1. Combination of C++ and Visual Basic<br>2. Comparable to Java, used in many Microsoft Products and Applications | *Compiled* |
| 34 | 2003 | **Scala** | Martin Odersky | Multi-paradigm, concurrent, functional, imperative, object-oriented language | *Compiled, Concurrent, Functional, Object oriented* |
| 35 | 2003 | **Groovy** | | Improvement on Java | *Compiled* |
| 36 | 2009 | **Go (GoLang)** | Robert Griesemer, Rob Pike, Ken Thompson (Google) | 1. Designed to overcome/fix problems of Java and C++<br>2. Syntax similar to C with addition of memory safety, garbage collection<br>3. Recent highest paid technical skill | *Compiled, Concurrent* |
| 37 | 2011 | **Kotlin** | JetBrains | 1. Designed to interoperate fully with Java<br>2. Google uses Kotlin as its preferred programming language for Android App since May 2019 | *Compiled, Functional* |
| 38 | 2012 | **TypeScript** | Microsoft | Strict syntactical superset of JavaScript and adds optional static typing to the language | |
| 39 | 2012 | **Julia** | Jeff Bezanson, Alan | High-level, high-performance, dynamic programming | *Array,* |

| | | | Edelman, Stefan Karpinski, Viral B. Shah | language well-suited for numerical analysis and computational science | *Compiled, Concurrent, Embedded, Functional, Numerical Analysis* |
|---|---|---|---|---|---|
| 40 | *2014* | **Swift** | Chris Lattner, Doug Gregor, John McCall, Ted Kremenek, Joe Groff (Apple) | As a replacement for almost all previous programming language used in Apple (C, C++, Objective C) | *Compiled, System* |

### *Legend: Different Time Periods*

| | |
|---|---|
| Pre 1950s | 1980s |
| 1950s | 1990s |
| 1960s | 2000s |
| 1970s | 2010s |

### *Tags: Different Programming Language Domains*

| | | | |
|---|---|---|---|
| *Array Programming* | *Data Oriented* | *Functional* | *Numerical Analysis* |
| *Assembly* | *Declarative* | *Hardware Description* | *Object Oriented* |
| *CLI* | *Educational* | *Interpreted* | *Procedural* |
| *Compiled* | *Embedded* | *Machine Code* | *Scripting* |
| *Concurrent* | *Extension* | *Meta programming* | *System* |

## REFERENCES

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