WIKIPEDIA

List of JVM languages

This **list of JVM Languages** comprises notable computer programming languages that are used to produce computer software that runs on the Java virtual machine (JVM). Some of these languages are interpreted by a Java program, and some are compiled to Java bytecode and JIT-compiled during execution as regular Java programs to improve performance.

The JVM was initially designed to support only the programming language Java. However, as time passed, even more languages were adapted or designed to run on the Java platform.

Contents

JVM languages
- High-profile languages
- JVM implementations of existing languages
- New languages with JVM implementations
  - Comparison of these languages

See also

Notes

References

JVM languages

High-profile languages

As of April 2022, according to the TIOBE Index[1] of the top 100 programming languages, the top JVM languages are:

- Java (#3), a statically-typed object-oriented language
- Kotlin (#27), a statically-typed language from JetBrains, the developers of IntelliJ IDEA[2] and Google's preferred language for Android
- Groovy (#32), a dynamic programming language (also with static typing) and scripting language[2]
- Scala (#36), a statically-typed object-oriented and functional programming language[3]
- Clojure (#49), a dynamic, and functional dialect of the Lisp programming language[2]

JVM implementations of existing languages

Language	JVM implementations
Golang	jgo (https://github.com/thomasmodeneis/jgo)
Arden Syntax	Arden2ByteCode
COBOL	NTT Data Enterprise COBOL[4] Micro Focus Visual COBOL[5] Heirloom Elastic COBOL (https://www.heirloomcomputing.com/elasticcobol/) Veryant isCOBOL Evolve (http://www.veryant.com/products/)[6]
ColdFusion Markup Language (CFML)	Adobe ColdFusion Railo Lucee Open BlueDragon
Common Lisp	Armed Bear Common Lisp[7]
Cypher	Neo4j[8]
Haskell	Eta (programming language) (https://eta-lang.org/)
JavaScript	Rhino Nashorn Graal.js[9]
LLVM Bitcode	Sulong[10]
Mercury	Mercury (Java grade)
OCaml	OCaml-Java (http://ocamljava.org/)
Component Pascal	Gardens Point Component Pascal
Pascal	MIDletPascal Oxygene
Raku	Rakudo
PHP	Quercus[11][12] JPHP
Prolog	JIProlog TuProlog
Python	Jython ZipPy[13] Graal.Python[9]
R	Renjin FastR[14]
Rexx	NetRexx
Ruby	JRuby TruffleRuby[15]

Language	JVM implementations
Scheme	Bigloo Kawa SISC JScheme
Simula	Open Source Simula (https://portablesimula.github.io/github.io/)
Smalltalk	Redline[16]
Standard ML	MLj (http://www.dcs.ed.ac.uk/home/mlj/)
Tcl	Jacl
Visual Basic	Jabaco[note 1]

New languages with JVM implementations

- Ateji PX, an extension of Java for easy parallel programming on multicore, GPU, Grid and Cloud[21]
- Ballerina (https://ballerina.io/learn/by-example), a programming language for cloud applications with structural typing; network client objects, services, resource functions, and listeners; parallel concurrency with workers; image building; configuration management; and taint checking.[22]
- BeanShell, a scripting language whose syntax is close to Java
- EPL (Event Processing Language), a domain-specific, data manipulation language for analyzing and detecting patterns in timed event streams, which extends SQL 92 with event-oriented features. It is implemented by Esper: up to version 6 EPL was mostly a language interpreted by a Java library; since version 7 it is compiled to JVM bytecode.
- Concurnas (https://concurnas.com), an open source JVM programming language designed for building reliable, scalable, high performance concurrent, distributed and parallel systems.
- Ceylon, a Java competitor from Red Hat[2]
- CFML, ColdFusion Markup Language, more commonly known as CFML, is a scripting language for web development that runs on the JVM, the .NET framework, and Google App Engine.[23]
- Quark Framework (CAL), a Haskell-inspired functional language
- E-on-Java, object-oriented programming language for secure distributed computing
- Eta, pure, lazy, strongly typed functional programming language in the spirit of Haskell[24]
- Fantom, a language built from the base to be portable across the JVM, .NET Common Language Runtime (CLR), and JavaScript[25][2]
- Flix, a functional, imperative, and logic programming language with first-class Datalog constraints and a polymorphic effect system.
- Flow Java
- Fortress, a language designed by Sun as a successor to Fortran, mainly for parallel scientific computing. Product development was taken over by Oracle when Sun was purchased. Oracle then stopped development in 2012 according to Dr. Dobb's.
- Frege, a non-strict, pure functional programming language in the spirit of Haskell[26]
- Golo, a simple, dynamic, weakly-typed language for the JVM developed at Institut national des sciences appliquées de Lyon, France, now an incubating project at the Eclipse Software Foundation.[27][28][29]
- Gosu, an extensible type-system language compiled to Java bytecode
- Haxe, a cross-platform statically typed language that targets Java as well as JVM.

- Ioke, a prototype-based language somewhat reminiscent of Io, with similarities to Ruby, Lisp and Smalltalk
- Jelly
- Join Java, a language that extends Java with join-calculus semantics
- Joy
- Judoscript
- Mirah, a customizable language featuring type inference and a highly Ruby-inspired syntax[30][31]
- NetLogo, a multi-agent language
- Noop, a language built with testability as a major focus
- Pizza, a superset of Java with function pointers and algebraic data types
- Pnuts
- Processing, a visualization and animation language and framework based on Java with a Java-like syntax
- Prompto (http://www.prompto.org/?section=language), a language "designed to create business applications in the cloud". It is part of the namesake platform to design business applications directly in the cloud. The Prompto language includes three "dialects": Engly, Monty, and Objy. Engly "mimics English as much as possible", Monty "tries to follow as much as possible the syntax of the Python 3 language", and Objy "tries to follow as much as possible the syntax of OOP languages such as C++, Java or C#". All three dialects seamlessly translate to one another.[32]
- RascalMPL, a source and target language independent (parameterized) meta programming language
- Whiley
- X10, a language designed by IBM, featuring constrained types and a focus on concurrency and distribution[2]
- Xtend, an object-oriented, functional, and imperative programming language built by the Eclipse foundation, featuring tight Java interoperability, with a focus on extension methods and lambdas, and rich tooling
- Yeti (http://mth.github.io/yeti/), an ML style functional programming language[33]
- Yirgacheffe (https://yirgacheffelang.com/), a language that aims to simplify and extend the object oriented paradigm.[34]
- Yoix, general purpose, non-object-oriented, interpreted dynamic programming language

Comparison of these languages

Language	First release	Stable release	Last release
Ballerina	2018	2019	2020
BeanShell	1999	2013	2016
Eclipse Ceylon	2011	2017	2017
CFML	1995	2018	2018
Quark Framework	2011	2018	
E	1997		
Fantom	2011	2017	
Fortress	2006	2011	2017
Frege			
Mirah	2016		
Xtend	2011	2021	

See also

- Da Vinci Machine
- Java virtual machine#JVM languages
- List of CLI languages, following the CLI specification, Microsoft's response to JVM

Notes

1. [17][18][19] is a freeware IDE in beta-testing since 2009, with a partly open source [20] Jabaco framework runtime. Jabaco compiles VB 6 syntax source to Java bytecode.

References

1. "TIOBE Index for April 2022 | TIOBE - The Software Quality Company" (https://www.tiobe.com/tiobe-index/). *www.tiobe.com*. Retrieved 1 January 2022.
2. Raoul-Gabriel Urma (1 July 2014). "Alternative Languages for the JVM. A look at eight features from eight JVM languages" (https://www.oracle.com/technetwork/articles/java/architect-languages-2266279.html). oracle.com. Retrieved 13 March 2019.
3. Wampler, Dean (15 January 2009). "Adopting New JVM Languages in the Enterprise (Updated)" (https://web.archive.org/web/20090522071822/http://blog.objectmentor.com/articles/2009/01/15/adopting-new-jvm-languages-in-the-enterprise). objectmentor.com. Archived from the original (http://blog.objectmentor.com/articles/2009/01/15/adopting-new-jvm-languages-in-the-enterprise) on 22 May 2009. Retrieved 18 June 2009.
4. "NTT Data Enterprise COBOL Brochure" (https://mx.nttdata.com/es/-/media/assets/brochure/apps-rehosting-migrate-your-cobol-applications-factsheet.pdf) (PDF).
5. "Visual COBOL Brochure" (https://www.microfocus.com/media/brochure/visual_cobol_brochure.pdf) (PDF). Retrieved 5 April 2017.
6. "isCOBOL Evolve Datasheet" (http://www.veryant.com/resources/isCOBOL-Evolve-datasheet.pdf) (PDF). Retrieved 17 May 2019.
7. Armed Bear Common Lisp (http://abcl.org/)

8. "New on Neo4j: The Neo4j 2.3.0 Milestone 2 Release Is Here" (https://neo4j.com/blog/new-on-neo4j-the-neo4j-2-3-0-milestone-2-release-is-here/). 12 June 2015. Retrieved 20 February 2017.
9. "Oracle Labs GraalVM: Programming Languages and Runtimes Overview" (http://www.oracle.com/technetwork/oracle-labs/program-languages/overview/index.html). *www.oracle.com*. Retrieved 12 April 2018.
10. "graalvm/sulong" (https://github.com/graalvm/sulong). *GitHub*. Retrieved 12 April 2018.
11. "Introducing Quercus, a Java based PHP" (http://www.ibm.com/developerworks/library/wa-quercus/). Retrieved 2 July 2015.
12. "Running PHP With Quercus in Sun Java System Web Server" (http://www.oracle.com/technetwork/java/quercus-php-137710.html). Retrieved 2 July 2015.
13. "ssllab / ZipPy — Bitbucket" (https://bitbucket.org/ssllab/zippy). *bitbucket.org*. Retrieved 12 April 2018.
14. "oracle/fastr" (https://github.com/oracle/fastr). *GitHub*. Retrieved 12 April 2018.
15. "oracle/truffleruby" (https://github.com/oracle/truffleruby/). *GitHub*. Retrieved 12 April 2018.
16. "Redline Smalltalk" (http://www.redline.st/). Retrieved 2 September 2018.
17. "Jabaco entry at Mindteq.com Basics section" (http://basic.mindteq.com/index.php?i=144). Retrieved 2 July 2015.]
18. "Article about Jabaco at German Pro-Linux publication" (http://www.pro-linux.de/news/1/13615/jabaco-basic-compiler-fuer-java.html). Retrieved 2 July 2015.]
19. "Basic meet Java" (http://www.jabaco.org/wiki/BASIC_meet_Java). Retrieved 26 February 2015.
20. "Framework" (https://code.google.com/p/jabacoframework/source/browse/#svn%2Ftrunk%2FFramework). Retrieved 26 February 2015.
21. "Ateji PX: Java Parallel Programming Made Simple" (https://web.archive.org/web/20140224011700/http://www.ateji.com/px/index.html). *Ateji*. Archived from the original (http://www.ateji.com/px/index.html) on 24 February 2014. Retrieved 1 March 2014.
22. "Announcing Ballerina 1.0" (https://blog.ballerina.io/posts/annoucing-1.0.0/). *Ballerina*. Retrieved 8 February 2020.
23. CFML, a scripting language compiled to Java, used on the ColdFusion or Railo application servers
24. "The Eta Programming Language" (http://eta-lang.org/). Retrieved 10 May 2017.
25. "Fantom Programming Language" (http://fantom.org/). *Fantom*. Retrieved 1 March 2014.
26. "Frege" (https://code.google.com/p/frege/). Retrieved 1 March 2014.
27. "Oracle.com - Golo – A Lightweight Dynamic Language for the JVM" (https://web.archive.org/web/20150703100856/https://blogs.oracle.com/java/entry/golo_a_lightweight_dynamic_language). Archived from the original (https://blogs.oracle.com/java/entry/golo_a_lightweight_dynamic_language) on 3 July 2015. Retrieved 2 July 2015.]
28. "Golo nominated for JAX Awards 2014" (https://jax.de/awards2014/nominees). Retrieved 2 July 2015.]
29. "Golo entry at JAX Awards 2014" (https://jax.de/awards2014/golo-programming-language). Retrieved 2 July 2015.]
30. "The Mirah Programming Language" (https://github.com/mirah/mirah). *GitHub*. Retrieved 1 March 2014.
31. "Mirah" (http://www.mirah.org/). Retrieved 1 March 2014.
32. "The Prompto Platform" (http://www.prompto.org/). Retrieved 14 September 2019.
33. "Yeti programming language" (http://mth.github.io/yeti/). Retrieved 5 May 2020.
34. "Yirgacheffe" (https://yirgacheffelang.com). Retrieved 9 January 2020.