

Project Specifications

Group 10

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About Java

Java is a general-purpose, concurrent, object-oriented programming language specifically designed to have as few implementation dependencies as possible. It is popular for its "write once, run anywhere" (WORA) support, meaning that code that runs on one platform does not need to be recompiled to run on another. Java applications are typically compiled to bytecode (class file) that can run on any Java virtual machine (JVM) regardless of computer architecture. Java derives much of its syntax from C and C++, but it has fewer low-level facilities than either of them. (Edited from original page at: [http://en.wikipedia.org/wiki/Java_\(programming_language\)](http://en.wikipedia.org/wiki/Java_(programming_language)))

Specifications

- Data types
 - int (-2^{31} to $+2^{31}-1$)
 - long (-2^{63} to $+2^{63}-1$)
 - float ($-3.4E+38$ to $+3.4E+38$ (approx))
 - double ($-1.8E+308$ to $+1.8E+308$ (approx))
 - char (0 to 65,535)
 - short ($-32,768$ to $+32,767$)
 - string (char[])
 - boolean (true, false)
- Identifiers
- Keywords
 - boolean, break, byte, case, char, class
 - const, continue, default, do, double, else, extends
 - finally, float, for, goto, if, import, int, final
 - long, new, package, private, protected, public
 - return, short, switch, while
 - abstract, assert, catch, enum, implements, instanceof, interface (if time permits)
 - static, super, this, throw, throws, try, void, volatile, native (if time permits)
- Constants
 - integers
 - reals
 - characters
 - strings
- Operators (precedence and associativity included)
 - Arithmetic
 - Binary: +, -, *, /, %
 - Unary: ++, --, -, +
 - Logical:
 - Binary: &&, ||
 - Unary: !
 - Relational: ==, !=, <, >, <=, >=
 - Bitwise:
 - Binary: &, |, ^, <<, >>
 - Unary: ~
 - Assignment: =, +=, -=, *=, /=, %=, &=, |=, ^=, <<=, >>=

- Ternary: ?:
- Statements (nested also, wherever applicable)
 - Assignments (single)
 - Conditional: if then, if then else
 - switch-case: default case included (switch data types: char, int)
 - Loops: while, for
 - Comments: //, /*..*/
 - Print Statements (basic data types)
- Functions
 - Arguments are passed by value (basic data types and pointer data type)
- Object-oriented features
 - Classes & Objects
 - Constructors (default, parameterized)
 - Access modifiers (public, private and protected)
 - Inheritance (Multilevel)

Implementation

- Language to be used: C++
- Lexical Analysis: Lex & Yacc
- The compiler will output Java bytecode, which can be executed on an appropriate version of JVM (Java Virtual Machine)
- Attempt to implement additional features (those listed in “Keywords” section) will be made if time permits
- If time permits, efforts will be directed into optimising the code