

## COMPUTER SCIENCE COMPETITION - JAVA TOPIC LIST 2010-11

**IMPORTANT NOTES:** Java is the official programming language for UIL Computer Science. Written test content for 2010-11 will conform to the Java 2 Platform Standard Edition, Version 6.0 (J2SE 6.0). This list is intended as a guideline and is not all-inclusive. Knowledge of basic Java concepts is assumed. Visit the UIL web site at [www.uil.utexas.edu](http://www.uil.utexas.edu) for a list of Java resources and other important contest information.

Base Conversions and Arithmetic
User-Defined Classes (constructors, methods, instance variables, private vs. public, overloading, overriding, final local variables, static final class variables, static methods, static non-final variables)
Constructors and initialization of static variables, default initialization of instance variables
Concepts of inheritance, abstract classes, interfaces and polymorphism
null, this, super, super.method(args), super(args), this.var, this.method(args), this(args)
Conversion to supertypes and (Subtype) casts, instanceof
Comparison of reference types (equals(), ==, !=, Comparable.compareTo())
Primitive types (int, double, boolean, short, long, byte, char, float), casting of primitives, autoboxing / unboxing
Arrays, including arrays of arrays and initialization of named arrays
Arithmetic operators (+, -, *, /, %, ++, --) and string concatenation
Using the values of ++, -- expressions in other expressions
Assignment operators (=, +=, -=, *=, /=, %=)
Boolean expressions and operators (==, !=, <, <=, >, >=, &&,   , !, &,  , ^) including short-circuit evaluation
Bitwise operators (<<, >>, >>>, &, ~,  , ^)
Branching (if, if/else, ?:, switch, break)
Looping (while, for, 5.0 enhanced for, return, do/while, break, continue)
System.out.print(), System.out.println(), System.out.printf()
Escape sequences (\", \\, \n, \', \t)
Parsing (String.split(), Integer.parseInt(), Double.parseDouble())
Regex (. + * \d \D \s \S \w \W [abc] [^abc] [a-zA-Z]) See the Pattern class.
Exceptions, throwing standard unchecked exceptions, checked exceptions (try/catch/finally, throw, throws)
Java Standard Library (String, Integer, Double, Character, Math, Object, Comparable, Exception, Scanner) See supplemental class reference list.
Generic collections (Collection, List, Set, Map, Stack, Queue, PriorityQueue, ArrayList, LinkedList, HashSet, TreeSet, HashMap, TreeMap, Iterator, ListIterator) See supplemental class reference list.
Arrays.sort() and Collections.sort()
Recursion
Stacks, Queues, Binary Trees, Linked Lists, Heaps, Hash Tables, Priority Queues, Graphs
Sorts (Selection, Insertion, Mergesort, Quicksort, Radix Sort, Heapsort) and Searches (Sequential, Binary)
Analysis of algorithms: informal comparison of running times, exact calculation of statement execution counts, Big-O notation, best case / worst case / average case time and space analysis