

# What's new in Dao 1.1 (to be released)

September 19, 2009

## **New features:**

1. Some built-in methods for functional programming (such as map(), reduce() etc.);
2. Some built-in functional style methods for data construction (such as string(), list() etc.)
3. Some math functions are also supported as built-in functions;
4. Enhanced switch-case statement;
5. New do{}while() statement;
6. Tail call optimization;
7. Type checking operators: ?=, ?<, and the associated VM instruction DVM.CHECK;
8. Operation asserting operator: ??, to check if the last operation is successful, and/or provide an alternative if not successful;
9. Automatic inheritance of constructors from single parent class/cdata;
10. DaoVmSpace\_AddVirtualFile(), and daoMainv.c to support packing script files into the Dao interpreter executable.
11. Parameter passing by reference, and constant parameters;

## **Important enhancement and changes:**

1. Keywords for declaring local/global constant, variables, instance variables;
2. Class definition: class body no longer allows statements;
3. Syntax for operator overloading;
4. Proper parsing >> in type names, and >= after type names, such as: *list<list<int>>*, *a : list<int>= {}* ;

5. Storage for local variables as references;
6. Decreased GC frequency to greatly decrease the GC overhead for single threaded version;
7. Improved GC by freeing more data directly, and by add tuple type to GC scanning process;
8. Reduced tuple creation when possible;
9. Revised type and function preparation methods for loading C modules;
10. Some C/C++ interface functions are moved from type DaoVmSpace to DaoNameSpace;
11. `math.rand()`, `math.rand_gaussian()` now take a parameter which is multiply to the standard distribution (even and normal);
12. Constant number literal should now use 'D' to mark double precision instead of using double '0';
13. "stdio" is changed to "io", and "stdio" is kept as an alias to "io" for compatibility;
14. "stdlib" is changed to "std", and "stdlib" is kept as an alias to "std" for compatibility;
15. "stdio.print/printf/println" are changed to "io.write/writeln", aliases are kept for compatibility;
16. Passing parameter as references for simple data types is back;
17. Now `max()` and `min()` methods of list and array return a tuple to include the value and index; And for list, a larger range of types are allowed for comparison;
18. Improved cast to tuples;
19. Disabled duplication of C functions, and disable data copying for parameters passed to C functions;

There are also a number of bug fixings. The **autobind.dao** tool is also improved.