Results from the Compiler Construction Competition

IMADA

May, 2013

Programs

Program	Group						
	1	2	3	4	5	6	7
C_ErrAssignToType							
C_ErrFuncParamsInvalidType						C_S	
C_ErrFuncParamsTooFew							
C_ErrFuncParamsTooMany							
C_ErrInvalidToken							
C_ErrTypeLoop						C_E	
C_ErrUnmatchedBeginComment					C_E	C_E	
C_NullWrong						C_E	
C_ReturnInMainScope							
F_FuncParamsEvalOrder	R_O			R_O		R_O	
F_RecordIsTupleOrSet					C_E		C_E
F_ShortCircuitAND						R_T	
F_ShortCircuitOR		R_O				R_T	
F_SimpleStructuralEquiv							C_E
O_AbsoluteValueTest							
O_AbsTest							
O_ArrayComparisonsA							
O_ArrayComparisonsB							
O_ArrayIndex							
O_ArrayLength							
O_ArrayOfOwnType					C_E		
O_ArrayOfRecords							
O_Assoc							
O_BinarySearchTree			C_E				
O_Comments							
O_Factorial							
O_FuncCallAsParamA							
O_FuncCallAsParamB							
O_FuncModifyingParams							

Program	Group						
	1	2	3	4	5	6	7
O_FuncRedefinedInItself							
O_FuncRedefinedReturnType							
O_FuncRedefinedType							
O_FuncReturnRecord							
O_Function							
O_IfThen							
O_Knapsack							
O_KnapsackNoComments							
O_LargeExpTreeA							
O_LargeExpTreeB							
O_LargeExpTreeC							
O_MultiDimArray						C_O	
O_MultipleTypecheckPassesA							
O_MultipleTypecheckPassesB			C_E				
O_MultipleTypecheckPassesC							
O_NullCorrect							
O_RecordComparisonsA							
O_RecordComparisonsB			C_E				
O_RecordsWithArray							
O_Recursion							
O_SimpleRecord						R_O	
O_StaticLinkA							
O_StaticLinkB							
O_StaticLink							
O_TypeJumpScope				C_S			
O_WhileDo							
R_ErrOutOfBounds1				R_E	R_E	R_E	R_E
R_ErrOutOfBounds2		$R_E(1)$		R_E	R_E	R_E	R_E
R_ErrRuntimeDiv0					R_S	R_S	
R_ErrRuntimeNegArraySize				R_E	R_S	R_S	R_E
R_ErrRuntimeNullPointer	R_S			R_S	R_S	R_S	R_E
R_ErrRuntimeOutOfMem				R_S	R_S	R_S	R_S

Total

Format: #all errors(#problematic errors)

	Group						
Problem Type	1	2	3	4	5	6	7
Compile-time			3(1)	1(1)	3(1)	5(4)	2(0)
Run-time	2(0)	2(1)		6(1)	6(1)	10(3)	5(0)
Total (of 61 tests)	2(0)	2(1)	3(1)	7(2)	9(2)	15(7)	7(0)

Legend

Compile-time problems:

C_E : Compiler gives no or incorrect error when an error during compilation was expected, or compiler gives an error when no error during compilation was expected.

$C_E(N)$: As C_E with the error code being N.

C_S : Compiler gives Segmentation fault or Floating exception.

C_O : The produced output cannot be assembled.

Run-time problems:

R_T : The compiled program does not terminate.

R_E : The compiled program gives no or incorrect runtime error when a runtime error was expected, or the compiled program gives a runtime error when no runtime error was expected.

$R_E(N)$: As R_E with the error code being N.

R_S : The compiled program gives Segmentation fault or Floating exception.

R_O : The compiled program produces incorrect output.

Time Trial on Knapsack

Compilation done using the -x switch (except when the compiler does not work with it). All tests performed on desdemona, each program run 3 times. All results in seconds.

Compiler	First	Second	Third	Average
1	10.101	10.017	10.101	10.073
2	14.697	14.725	14.677	14.700
3	22.485	22.517	22.501	22.501
4	42.363	42.579	42.291	42.411
5	40.239	40.163	40.211	40.204
6	69.848	69.460	69.444	69.584
7	29.142	29.118	29.754	29.338
GCC 4.6.3	12.781	12.585	12.513	12.626
GCC O1	9.565	9.569	9.585	9.573
GCC O2	9.853	9.753	9.777	9.794
GCC O3	8.349	8.413	8.381	8.381
TA's	33.042	33.138	33.030	33.070

Extra Features

	Group						
Feature	1	2	3	4	5	6	7
Free-List			✓				
Function Inlining	✓						
Garbage Collection	✓	✓					
Peephole Optimization	✓	✓	✓				
Register Allocation via Liveness Analysis	✓	✓					
Strings	✓	✓					