Results from the Compiler Construction Competition

IMADA

May, 2014

Programs

Program	Group						
	1	2	3	4	5	6	10
F_FuncParamsEvalOrder.vit							
F_RecordIsTupleOrSet.vit	C_E	C_E		C_E			
F_ShortCircuitAND.vit							
F_ShortCircuitOR.vit							
F_SimpleStructuralEquiv.vit	C_E	C_E				C_E	
O_AbsoluteValueTest.vit				C_E			
O_AbsTest.vit							
O_ArrayComparisonsA.vit	C_E		$C_E(1)$				
O_ArrayComparisonsB.vit	C_S	C_E	C_S				
O_ArrayIndex.vit							
O_ArrayLength.vit							
O_ArrayOfOwnType.vit	C_E	C_E		C_E		C_E	
O_ArrayOfRecords.vit			C_S			C_S	
O_Assoc.vit							
O_BinarySearchTree.vit	C_E	C_E	C_S			C_S	
O_Comments.vit							
O_Factorial.vit							
O_FuncCallAsParamA.vit							
O_FuncCallAsParamB.vit	$R_E(1)$						
O_FuncModifyingParams.vit	C_E						
O_FuncRedefinedInItself.vit	C_E	C_E					
O_FuncRedefinedReturnType.vit	C_E						
O_FuncRedefinedType.vit							
O_FuncReturnRecord.vit	$R_E(1)$						
O_Function.vit							
O_IfThen.vit							
O_LargeExpTreeA.vit							
O_LargeExpTreeB.vit							
O_LargeExpTreeC.vit							

Program	Group						
	1	2	3	4	5	6	10
O_MultiDimArray.vit							
O_MultipleTypecheckPassesA.vit	C_E	C_E				C_E	
O_MultipleTypecheckPassesB.vit	C_E	C_E	C_S			C_S	
O_MultipleTypecheckPassesC.vit							
O_NullCorrect.vit							
O_RecordComparisonsA.vit	C_E		C_E				
O_RecordComparisonsB.vit	C_E	C_E	C_S	C_E		C_E	
O_RecordsWithArray.vit			C_O				
O_Recursion.vit							
O_SimpleRecord.vit							
O_StaticLinkA.vit							
O_StaticLinkB.vit							
O_StaticLink.vit							
O_TypeJumpScope.vit	C_E	C_E	C_E			C_S	
O_WhileDo.vit							
C_ErrAssignToType.vit							
C_ErrFuncParamsInvalidType.vit				C_E			
C_ErrFuncParamsTooFew.vit							
C_ErrFuncParamsTooMany.vit							
C_ErrInvalidToken.vit							
C_ErrTypeLoop.vit							
C_ErrUnmatchedBeginComment.vit						R_E	
C_NullWrong.vit			R_E				
C_ReturnInMainScope.vit							
R_ErrOutOfBounds1.vit				R_E		R_E	
R_ErrOutOfBounds2.vit				R_E		R_E	
R_ErrRuntimeDiv0.vit				R_S		R_S	
R_ErrRuntimeNegArraySize.vit		R_S		R_S		R_E	
R_ErrRuntimeNullPointer.vit	R_S	R_E	R_S	R_S		R_S	
R_ErrRuntimeOutOfMem.vit	R_S		R_S	R_S			

Total

Format: #all errors(#problematic errors)

	Group						
Problem Type	1	2	3	4	5	6	10
Compile-time	14	10	9	5(4)	0	8	0
Run-time	4(2)	2(0)	3(1)	6(0)	0	6(0)	0
Total (of 60 tests)	18(16)	12(10)	12(10)	11(4)	0	8	0

Legend

Compile-time problems:

C_T : Compiler does not terminate.

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	125.62	125.92	125.71	125.75
2	40.209	41.696	39.279	40.545
3	26.445	25.845	27.262	26.517
4	9.382	9.387	9.398	9.389
5	39.598	39.725	40.434	39.919
6	61.13	61.63	61.88	61.547
10	14.404	14.636	14.795	14.612
GCC 4.6.4	12.912	12.760	12.733	12.801
GCC O1	9.551	9.544	9.560	9.552
GCC O2	9.744	9.761	9.792	9.766
GCC O3	8.783	8.844	8.753	8.793
TA's	14.450	14.530	14.528	14.503

Extra Features

	Group						
Feature	1	2	3	4	5	6	10
Object Orientation				✓			
Peephole Optimization	✓	✓	✓	✓	✓	✓	✓
Register Allocation with liveness analysis			✓	✓			✓
Strings				✓			
Constant folding			✓				
Constant propagation				✓			
Standard Library (Multi-threading)				✓			