Results from the Compiler Construction Competition

IMADA

May, 2015

Programs

Program	Group					
	1	2	3	4	8	9
F_FuncParamsEvalOrder.die		C_E			R_O	R_O
F_RecordIsTupleOrSet.die	C_E	C_E		C_E	C_S	
F_ShortCircuitAND.die		C_S			R_O	C_O
F_ShortCircuitOR.die		C_S			R_O	C_O
F_SimpleStructuralEquiv.die	C_E	C_S		C_E	C_S	C_E
O_AbsoluteValueTest.die		C_S	C_E	C_E	C_S	C_S
O_AbsTest.die		C_S				
O_ArrayComparisonsA.die		C_S				C_S
O_ArrayComparisonsB.die		C_S	C_E		C_E	C_S
O_ArrayIndex.die		C_S				C_S
O_ArrayLength.die		C_E			R_O	R_O
O_ArrayOfOwnType.die		C_E			C_E	R_O
O_ArrayOfRecords.die		C_S	C_E		C_S	C_S
O_Assoc.die		C_E				
O_BinarySearchTree.die		C_S	C_E		C_S	C_E
O_Comments.die		C_E				
O_Factorial.die		C_E				
O_FuncCallAsParamA.die		C_E				
O_FuncCallAsParamB.die		C_E				
O_FuncModifyingParams.die		C_S			C_S	C_S
O_FuncRedefinedInItself.die		C_S		C_E	C_O	C_S
O_FuncRedefinedReturnType.die	C_E	C_S	C_E	C_E	C_E	
O_FuncRedefinedType.die		C_E			C_E	R_O
O_FuncReturnRecord.die		C_E	C_E		C_S	C_E
O_Function.die		C_E				
O_IfThen.die		C_S				
O_LargeExpTreeA.die		C_E				
O_LargeExpTreeB.die		C_S				
O_LargeExpTreeC.die		C_S				

Program	Group					
	1	2	3	4	8	9
O_MultiDimArray.die		C_S			C_E	C_S
O_MultipleTypecheckPassesA.die		C_S	C_E			C_E
O_MultipleTypecheckPassesB.die		C_S			C_S	C_S
O_MultipleTypecheckPassesC.die		C_E				
O_NullCorrect.die		C_S				C_E
O_RecordComparisonsA.die		C_S	C_E			C_E
O_RecordComparisonsB.die		C_S	C_E		C_S	C_E
O_RecordsWithArray.die		C_S			C_E	C_S
O_Recursion.die		C_S				R_O
O_SimpleRecord.die		C_E				C_S
O_StaticLinkA.die		C_S				R_T
O_StaticLinkB.die		C_S			C_S	C_S
O_StaticLink.die		C_S			C_S	C_S
O_TypeJumpScope.die		C_S	C_E		C_S	C_S
O_WhileDo.die		C_S				R_O
C_ErrAssignToType.die					C_S	C_E
C_ErrFuncParamsInvalidType.die		C_S				
C_ErrFuncParamsTooFew.die						C_S
C_ErrFuncParamsTooMany.die						C_S
C_ErrInvalidToken.die					C_E	C_E
C_ErrTypeLoop.die			C_E		C_E	C_E
C_ErrUnmatchedBeginComment.die					C_E	C_E
C_NullWrong.die		C_S			C_E	
C_ReturnInMainScope.die						C_E
R_ErrOutOfBounds1.die		C_S			R_E	C_S
R_ErrOutOfBounds2.die		C_S			R_E	C_S
R_ErrRuntimeDiv0.die		C_S			R_S	R_E
R_ErrRuntimeNegArraySize.die		C_S			C_E	R_E
R_ErrRuntimeNullPointer.die		C_S	R_S		R_S	C_E
R_ErrRuntimeOutOfMem.die		C_S			C_S	R_E

Total

Format: #all errors(#problematic errors)

	Group					
Problem Type	1	2	3	4	8	9
Compile-time	3(0)	51	11(7)	5(1)	26(22)	33(28)
Run-time	0	0	1(0)	0	8(1)	10(3)
Total (of 60 tests)	3(0)	51	12(7)	5(1)	34(23)	43(31)

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	19.852	19.867	19.897	19.872
2	–	–	–	–
3	37.251	37.784	37.230	37.422
4	19.482	19.410	19.417	19.458
8	–	–	–	–
9	–	–	–	–
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	10.002	10.426	10.556	10.328

Extra Features

	Group					
Feature	1	2	3	4	8	9
Peephole Optimization	✓		✓	✓		
Register Allocation with liveness analysis	✓			✓		
Strings	✓			✓		
Constant folding			✓	✓		
Standard Library				✓		
Annotations				✓		
File linker				✓		