EVM Semantics Evaluation Results

perfx

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1 Tables

1.1 Opcode Summarization Results

Table 1: Opcode Summarization Results

Category	Successful Opcodes	Failed Opcodes
Arith. & Bit.	SUB, DIV, ADD, MOD, SMOD, SDIV, ADDMOD, MULMOD, SIGNEXTEND, AND, EVMOR, XOR, NOT, SHL, BYTE, SHR	MUL, EXP, SAR
Comparison	LT, GT, SLT, EQ, SGT, ISZERO	
Flow Control	STOP, PC, JUMPDEST, INVALID, RETURN, REVERT, UNDEFINED	JUMP, JUMPI
Stack	POP, PUSHZERO, PUSH1-32, DUP1-16, SWAP1-16	
Memory	MLOAD, MSTORE, MSTORE8, MSIZE, MCOPY	
Storage	SLOAD, SSTORE	
Trans. Storage	TLOAD, TSTORE	
Environment	COINBASE, BLOCKHASH, TIMESTAMP, NUMBER, PREVRANDAO, DIFFICULTY, GASLIMIT, CHAINID	BASEFEE
Context	ADDRESS, ORIGIN, CALLER, CALLDATALOAD, CALLDATASIZE, CALLDATACOPY, CODESIZE, CODECOPY, GASPRICE, BALANCE, RETURNDATASIZE, RETURNDATACOPY, SELFBALANCE, GAS	CALLVALUE, EXTCODECOPY, EXTCODEHASH, EXTCODESIZE
System	LOG0-4	SHA3
Contract		CALL, CALLCODE, CREATE, CREATE2, DELEGATECALL, SELFDESTRUCT, STATICCALL

1.2 Statistics of Opcode Summarization

Table 2: Statistics of Opcode Summarization

Category	#	G. Succ.	V. Succ.	G. Time (s)	V. Time (s)	Steps	$\{}Delta$ Steps
Arith. & Bit.	19	84.2%	100.0%	52.0	161.9	8.0	87.5%
Comparison	6	100.0%	100.0%	64.4	94.8	9.5	89.5%
Flow Control	9	77.8%	100.0%	52.1	106.7	6.8	85.4%
Stack	5	100.0%	100.0%	77.4	110.6	9.3	89.2%
Memory	5	100.0%	100.0%	78.3	106.7	10.1	90.1%
Storage	2	100.0%	100.0%	97.9	693.5	10.5	90.5%
Trans. Storage	2	100.0%	100.0%	72.9	107.2	9.0	88.9%
Environment	9	88.9%	100.0%	65.3	374.5	8.4	88.2%
Context	18	77.8%	100.0%	66.6	428.6	7.8	87.2%
System	2	50.0%	100.0%	41.8	103.3	5.0	80.0%
Contract	7	0.0%	0.0%	0.0	0.0	0.0	0.0%
Total	84	78.6%	100.0%	73.3	233.6	9.6	89.6%

2 Charts

2.1 Concrete Execution Performance Comparison

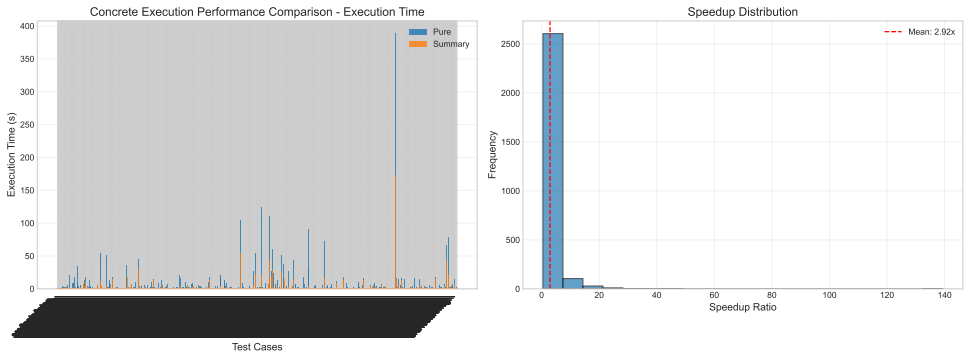

Figure 1: Concrete Execution Performance Comparison

2.2 Concrete Execution Performance Distribution

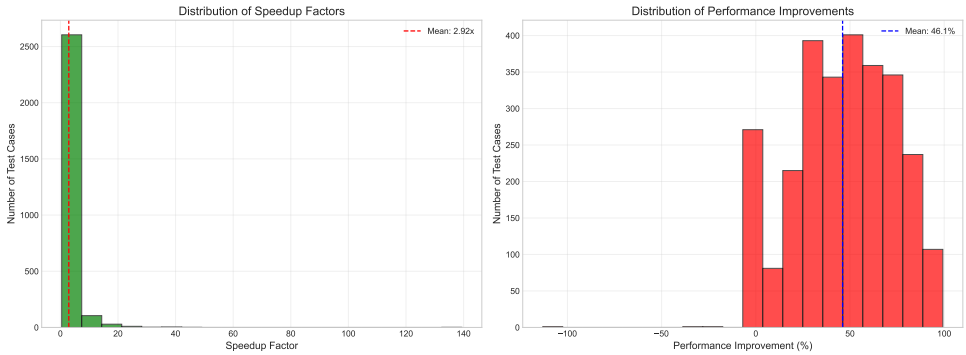

Figure 2: Concrete Execution Performance Distribution

2.3 Performance Comparison: Original vs Summarized Semantics

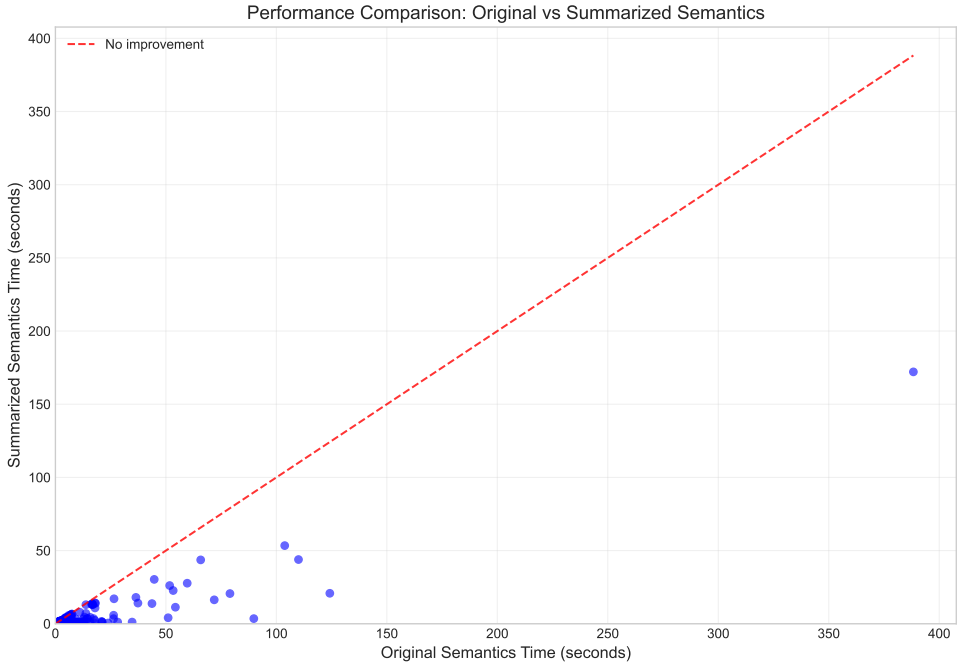

Figure 3: Performance Comparison: Original vs Summarized Semantics

2.4 Top 20 Test Cases by Performance Improvement

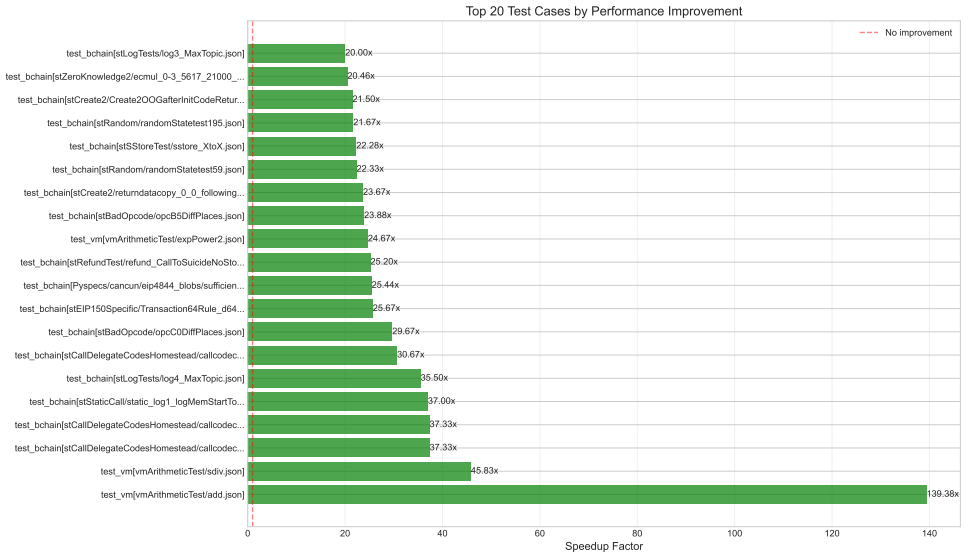

Figure 4: Top 20 Test Cases by Performance Improvement

2.5 Symbolic Execution Performance Comparison: Original vs Summarized Semantics

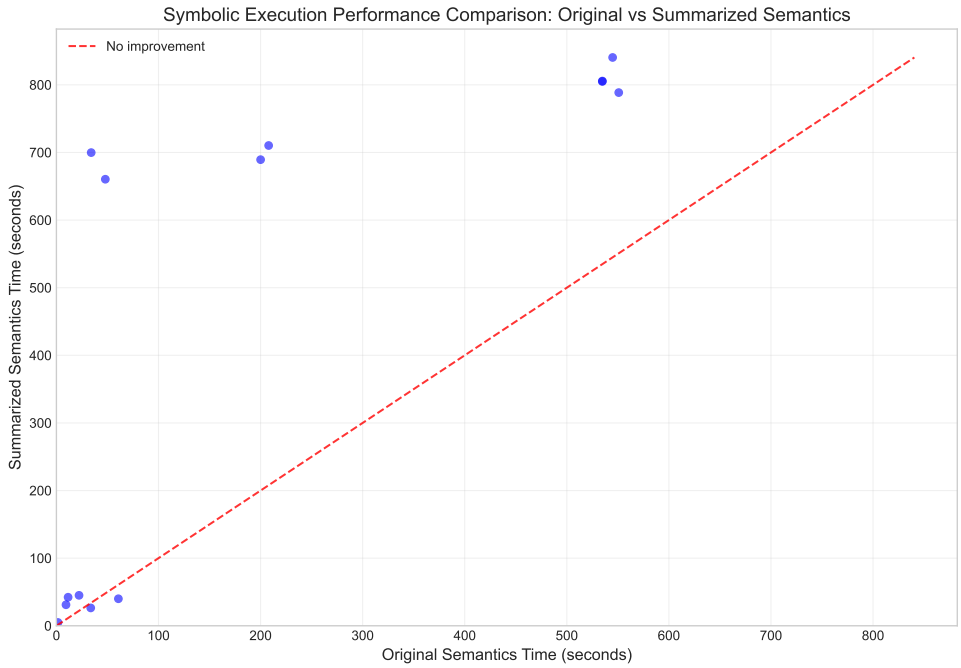

Figure 5: Symbolic Execution Performance Comparison: Original vs Summarized Semantics

2.6 Top Symbolic Test Cases by Performance Improvement

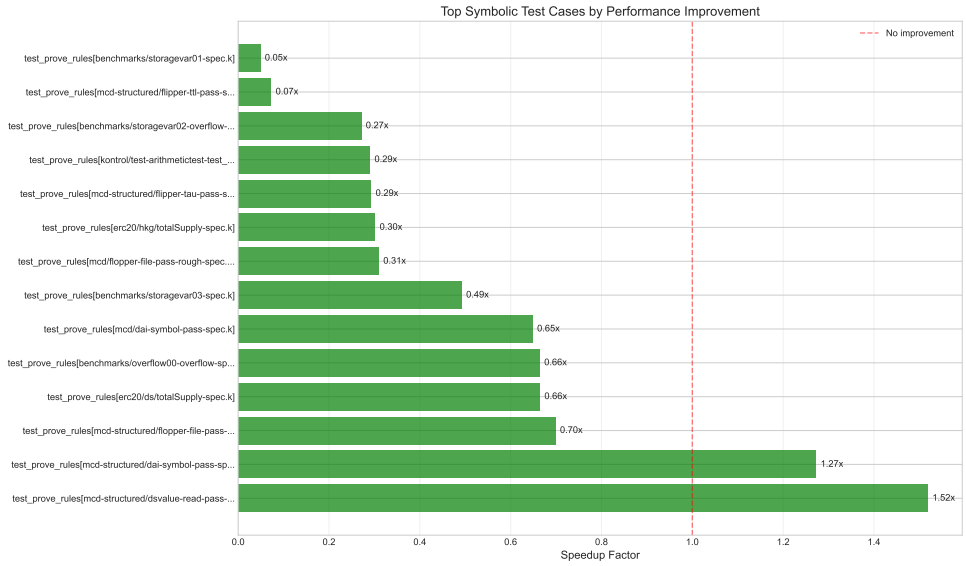

Figure 6: Top Symbolic Test Cases by Performance Improvement

2.7 Symbolic Execution Performance Comparison (Booster): Original vs Summarized Semantics

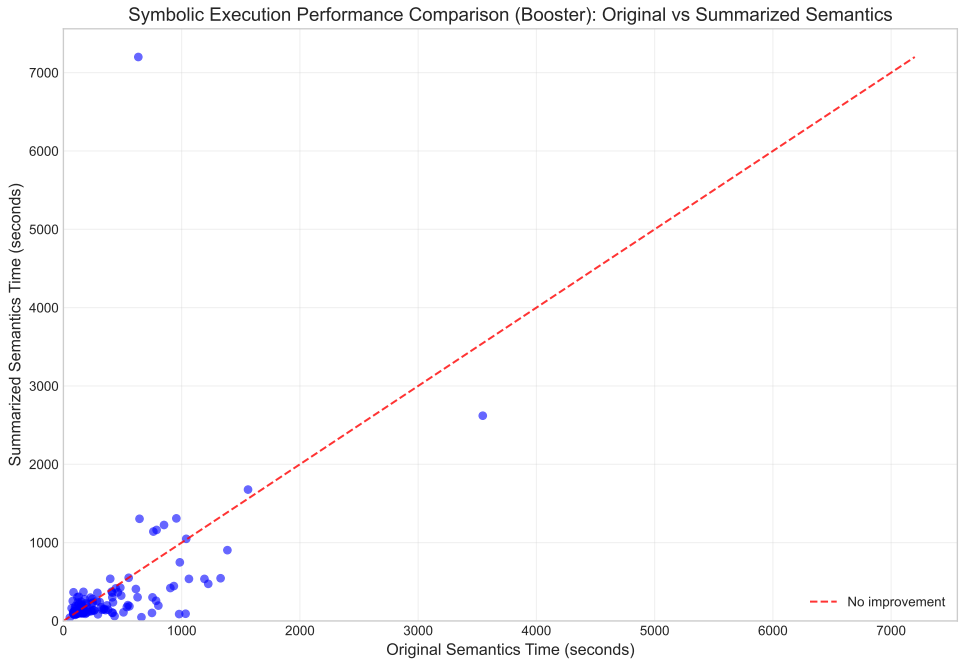

Figure 7: Symbolic Execution Performance Comparison (Booster): Original vs Summarized Semantics

2.8 Top Symbolic Test Cases by Performance Improvement (Booster)

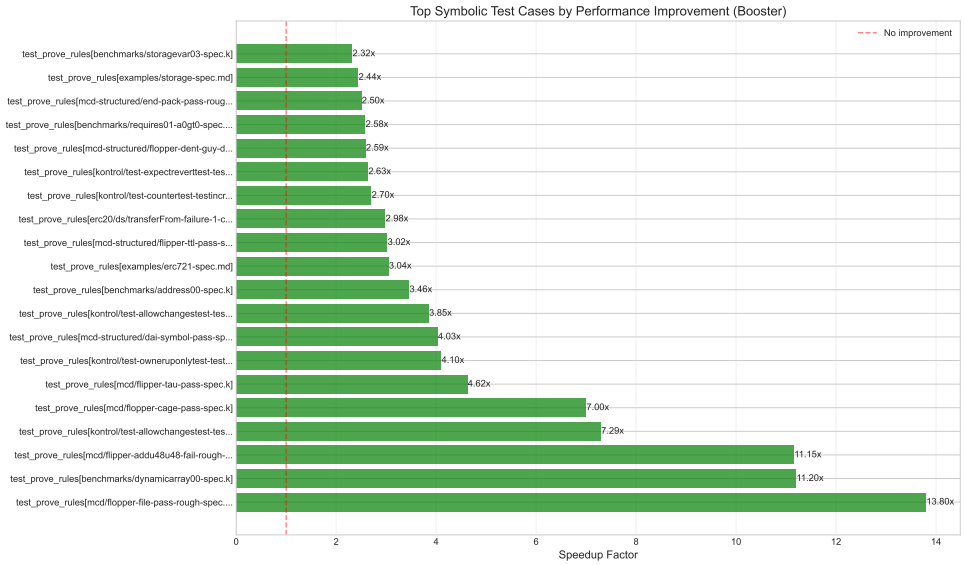

Figure 8: Top Symbolic Test Cases by Performance Improvement (Booster)

2.9 Symbolic Execution Performance Comparison (Summaries): Original vs Summarized Semantics

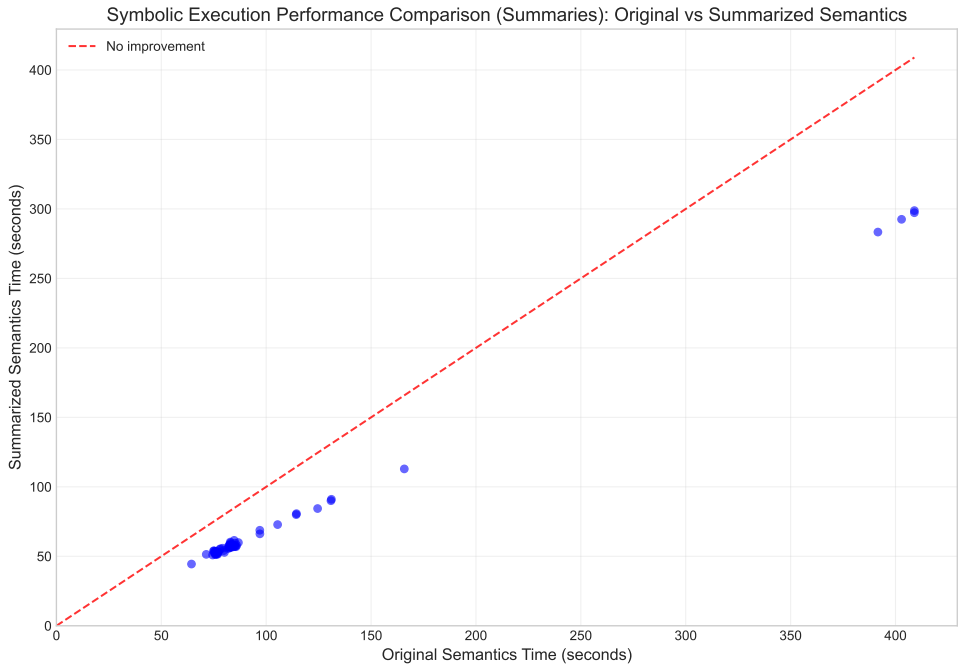

Figure 9: Symbolic Execution Performance Comparison (Summaries): Original vs Summarized Semantics

2.10 Top Symbolic Test Cases by Performance Improvement (Summaries)

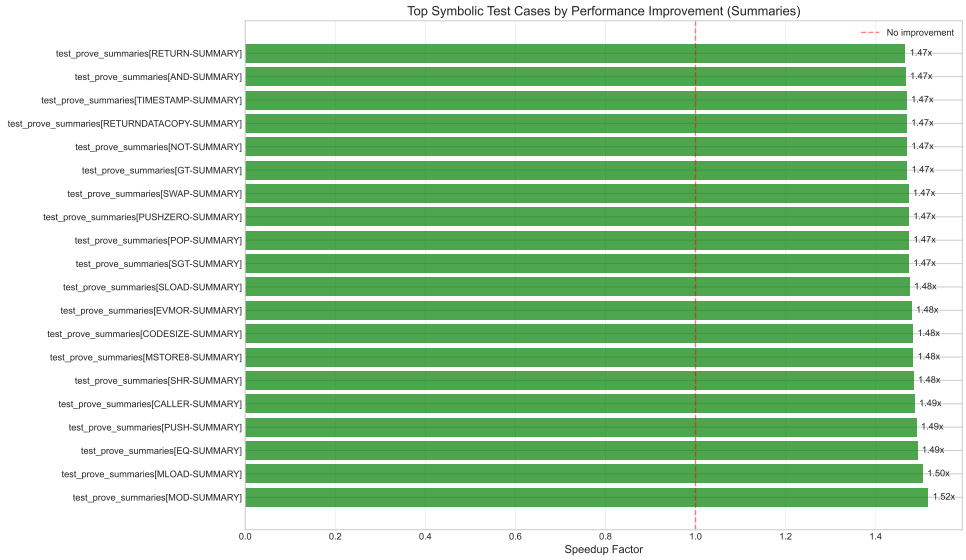

Figure 10: Top Symbolic Test Cases by Performance Improvement (Summaries)

2.11 Symbolic Execution Performance Comparison (DSS): Original vs Summarized Semantics

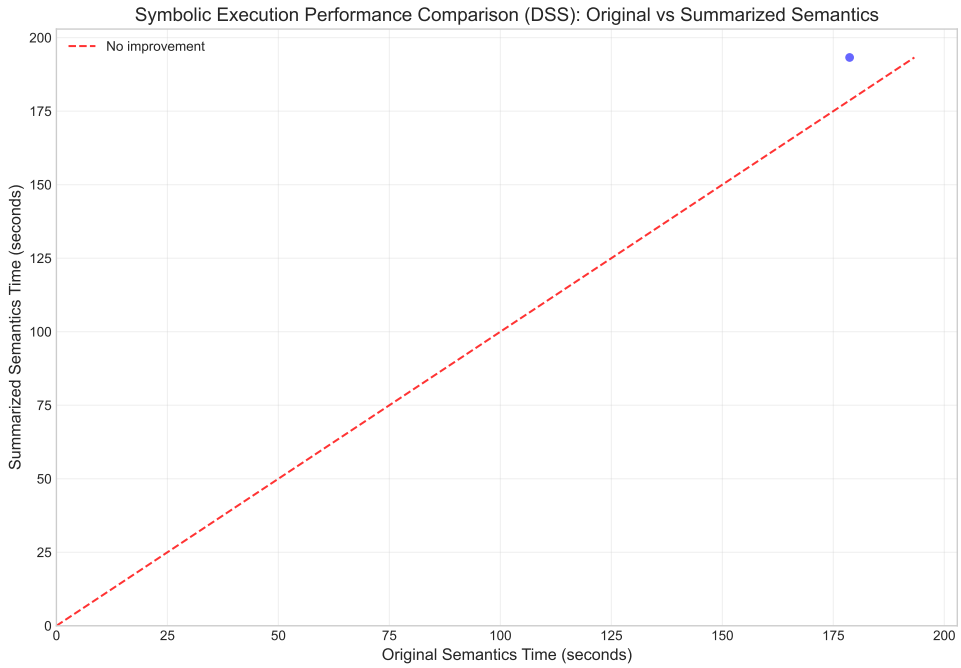

Figure 11: Symbolic Execution Performance Comparison (DSS): Original vs Summarized Semantics

2.12 Top Symbolic Test Cases by Performance Improvement (DSS)

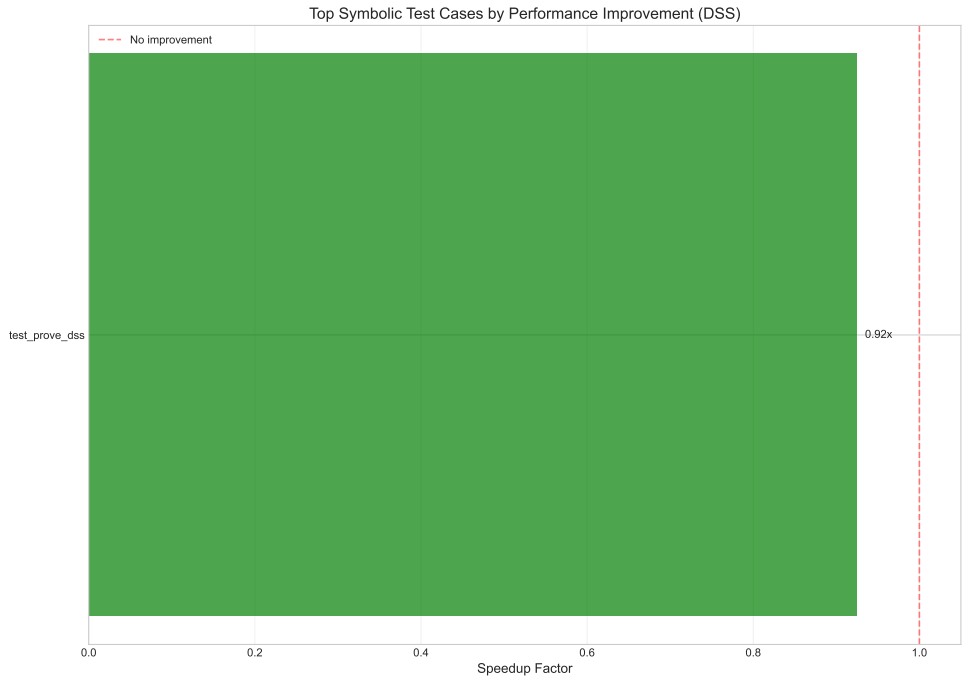

Figure 12: Top Symbolic Test Cases by Performance Improvement (DSS)