# Artisan Testing Results

July 28, 2023

## 1 c++98

### 1.1 Tests table

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **ArrayTypeTraitExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.052 | True |
| **CXXBindTemporaryExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **CXXBoolLiteralExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **CXXConstCastExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.055 | True |
| **CXXConstructExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.052 | True |
| **CXXConversionDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.06 | True |
| **CXXDefaultArgExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.044 | True |
| **CXXDependentScopeMemberExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.054 | True |
| **CXXDestructorDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **CXXDynamicCastExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **CXXFoldExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **CXXFunctionalCastExpr** | 0.02 | True | 0.02 | True | 0 | False | 0.047 | True |
| **CXXMemberCallExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.056 | True |
| **CXXNewExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.057 | True |
| **CXXOperatorCallExpr** | 0.01 | True | 0.02 | True | 0 | False | 0.047 | True |
| **CXXPseudoDestructorExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **CXXReinterpretCastExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **CXXScalarValueInitExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **CXXStaticCastExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **CXXThisExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **CXXThrowExpr** | 0.24 | True | 0.24 | True | 0 | False | 0.501 | True |
| **CXXTypeidExpr** | 0.23 | True | 0.23 | True | 0 | False | 0.509 | True |
| **CXXUnresolvedConstructExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **ClassScopeFunctionSpecializationDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **ClassTemplatePartialSpecializationDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **ClassTemplateSpecializationDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **DependentScopeDeclRefExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.051 | True |
| **ExprWithCleanups** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **FileScopeAsmDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **FriendDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **FunctionTemplateDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **GNUNullExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **ImplicitCastExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **InitListExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **LinkageSpecDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.043 | True |
| **MaterializeTemporaryExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **NamespaceAliasDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **NamespaceDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.044 | True |
| **NonTypeTemplateParmDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **OpaqueValueExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **ParenListExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **SizeOfPackExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **SubstNonTypeTemplateParmExpr** | 0.21 | True | 0.22 | True | 0 | False | 0.509 | True |
| **TemplateTypeParmDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **UnresolvedUsingValueDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **UsingDirectiveDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.062 | True |
| **VAArgExpr** | 0.04 | True | 0.04 | True | 0 | False | 0.09 | True |
| **and** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **and_eq** | 0.01 | True | 0.01 | True | 0 | False | 0.044 | True |
| **bitand** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **bitor** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **bool** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **break_do** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **break_for** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **break_switch** | 0.01 | True | 0.01 | True | 0 | False | 0.053 | True |
| **break_while** | 0.01 | True | 0.01 | True | 0 | False | 0.042 | True |
| **case** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **catch** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **char** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **class** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **class_public** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **compl** | 0.02 | True | 0.02 | True | 0 | False | 0.046 | True |
| **const** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **const_cast** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **continue_do_while_loop** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **continue_for_loop** | 0.01 | True | 0.01 | True | 0 | False | 0.044 | True |
| **continue_while_loop** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **default** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **delete_ptr** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **do_while** | 0.01 | True | 0.01 | True | 0 | False | 0.053 | True |
| **double_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **dynamic_cast** | 0.01 | True | 0.01 | True | 0 | False | 0.054 | True |
| **enum_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **explicit_struct_member_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **extern_language_func_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **false** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **float_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.051 | True |
| **for_loop** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **friend_member_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **goto** | 0.01 | True | 0.01 | True | 0 | False | 0.062 | True |
| **if** | 0.01 | True | 0.01 | True | 0 | False | 0.052 | True |
| **if_else** | 0.01 | True | 0.01 | True | 0 | False | 0.057 | True |
| **inline_func_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **int_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.044 | True |
| **long_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **mutable_struct_member_decl** | 0.03 | True | 0.03 | True | 0 | False | 0.072 | True |
| **named_union_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **namespace** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **new** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **not** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **not_eq** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **operator** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **or** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **or_eq** | 0.01 | True | 0.01 | True | 0 | False | 0.057 | True |
| **private** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **protected_member_decl** | 0.01 | True | 0.02 | True | 0 | False | 0.046 | True |
| **register** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **return** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **short_val_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.057 | True |
| **signed_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.042 | True |
| **sizeof** | 0.01 | True | 0.01 | True | 0 | False | 0.059 | True |
| **static_cast** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **static_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.052 | True |
| **struct_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **switch_case** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **template_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **template_typename** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **this** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **throw** | 0.22 | True | 0.23 | True | 0 | False | 0.489 | True |
| **true** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **try** | 0.03 | True | 0.03 | True | 0 | False | 0.095 | True |
| **typedef** | 0.01 | True | 0.01 | True | 0 | False | 0.055 | True |
| **typeid** | 0.02 | True | 0.02 | True | 0 | False | 0.054 | True |
| **unsigned_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **using** | 0.02 | True | 0.02 | True | 0 | False | 0.054 | True |
| **using_namespace** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **virtual_struct_member_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **void_func_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **volatile_var_decl** | 0.03 | True | 0.03 | True | 0 | False | 0.067 | True |

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **wchar_t_var_decl** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **while_loop** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **xor** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **xor_eq** | 0.02 | True | 0.02 | True | 0 | False | 0.053 | True |

## 1.2 Success and Fail Rate chart

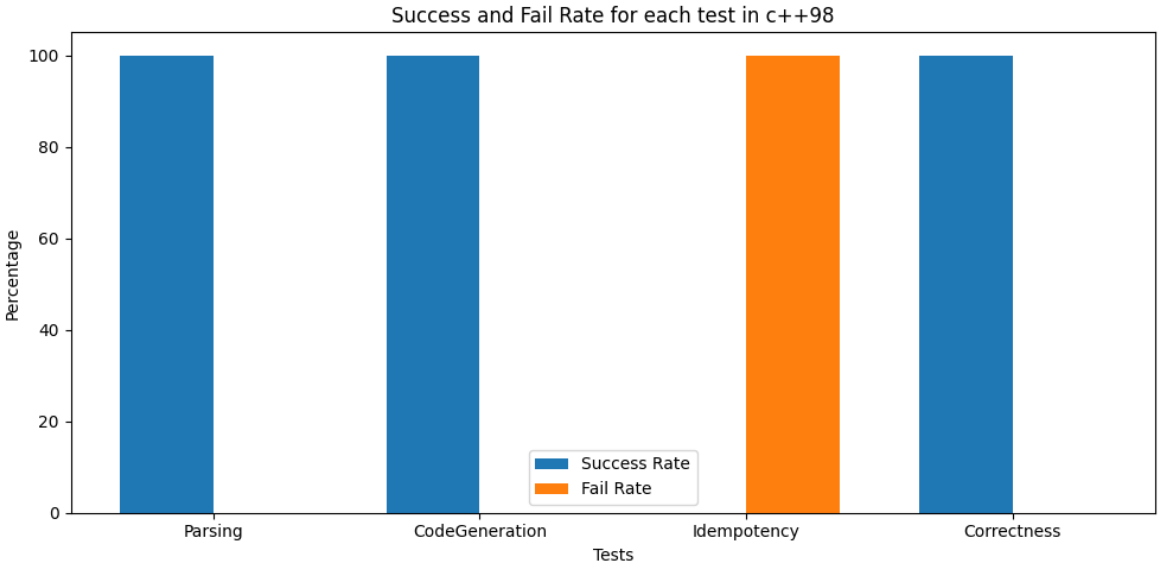


Figure 1: Success and Fail Rate for each test in c++98

# 2 c++11

## 2.1 Tests table

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **ArrayInitIndexExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **ArrayInitLoopExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **AtomicExpr** | 0.02 | True | 0.02 | True | 0 | False | 0.049 | True |
| **CXXDefaultInitExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.043 | True |
| **CXXDeleteExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.052 | True |
| **CXXForRangeStmt** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **CXXInheritedCtorInitExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.051 | True |
| **CXXNoexceptExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **CXXNullPtrLiteralExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **CXXStdInitializerListExpr** | 0.02 | True | 0.02 | True | 0 | False | 0.063 | True |
| **ConstantExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **ConstructorUsingShadowDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **LambdaExpr** | 0.01 | True | 0.02 | True | 0 | False | 0.047 | True |
| **PackExpansionExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **TypeAliasDecl** | 0.01 | True | 0.02 | True | 0 | False | 0.045 | True |
| **TypeTraitExpr** | 0.03 | True | 0.03 | True | 0 | False | 0.091 | True |
| **UnresolvedLookupExpr** | 0.01 | True | 0.01 | True | 0 | False | 0.054 | True |
| **UnresolvedUsingTypenameDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.044 | True |
| **UserDefinedLiteral** | 0.16 | True | 0.16 | True | 0 | False | 0.359 | True |
| **alignas** | 0.9 | True | 0.9 | True | 0 | False | 0.049 | True |
| **alignof** | 1.12 | True | 1.12 | True | 0 | False | 2.59 | True |
| **auto** | 0.01 | True | 0.01 | True | 0 | False | 0.056 | True |
| **char16_t** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **char32_t** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **class_enum_type** | 0.01 | True | 0.01 | True | 0 | False | 0.047 | True |
| **constexpr** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **decltype** | 0.02 | True | 0.02 | True | 0 | False | 0.045 | True |
| **default_explicity_special** | 0.01 | True | 0.01 | True | 0 | False | 0.05 | True |
| **delete_funcs** | 0.22 | True | 0.22 | True | 0 | False | 0.576 | True |
| **for_ranged** | 0.02 | True | 0.02 | True | 0 | False | 0.057 | True |
| **inline_namespace** | 0.01 | True | 0.01 | True | 0 | False | 0.041 | True |
| **mutable_lambda** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **noexcept** | 0.01 | True | 0.01 | True | 0 | False | 0.054 | True |
| **nullptr** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **reinterpret_cast** | 0.06 | True | 0.06 | True | 0 | False | 0.076 | True |
| **sizeof_ellipsis** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **static_assert** | 0.03 | True | 0.03 | True | 0 | False | 0.086 | True |
| **thread_local** | 0.38 | True | 0.38 | True | 0 | False | 0.975 | True |
| **using_alias** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |

## 2.2 Success and Fail Rate chart

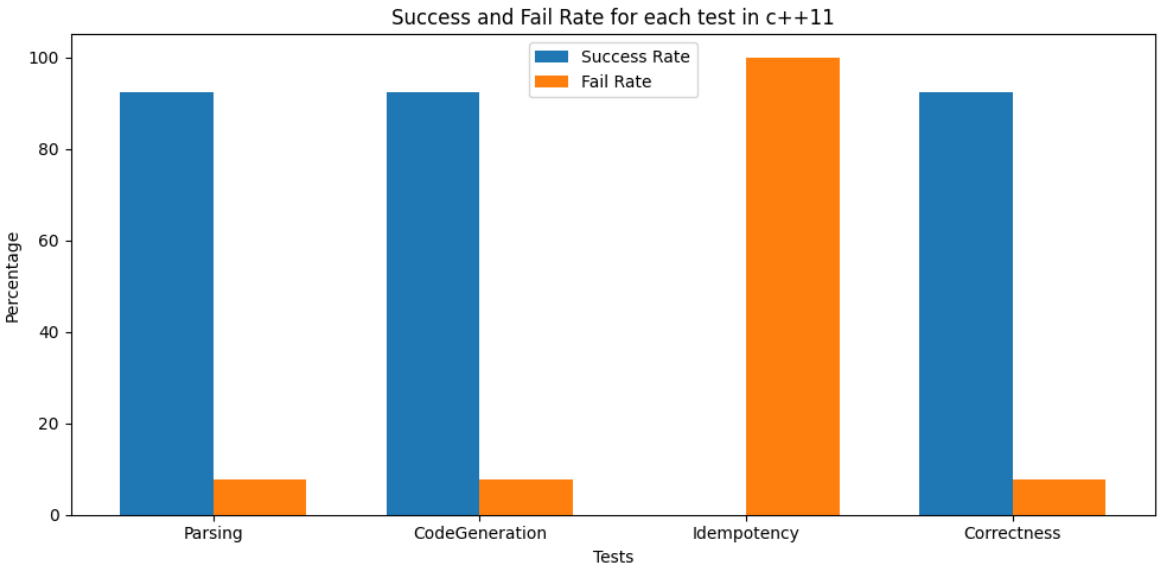


Figure 2: Success and Fail Rate for each test in c++11

# 3 c++14

## 3.1 Tests table

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **VarTemplateDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **VarTemplatePartialSpecializationDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **VarTemplateSpecializationDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |

### 3.2 Success and Fail Rate chart

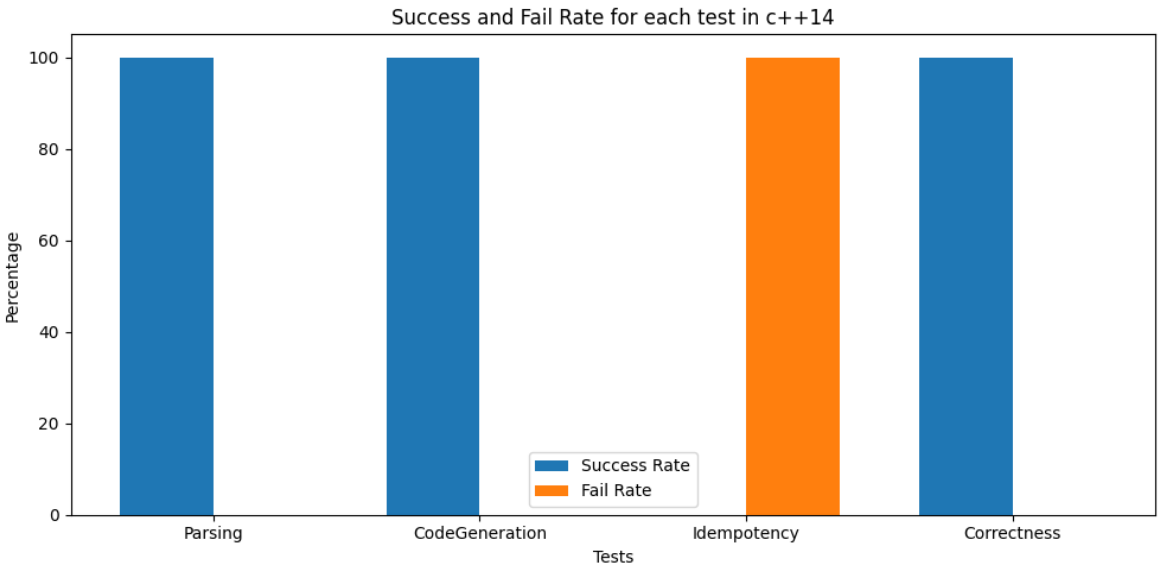


Figure 3: Success and Fail Rate for each test in c++14

# 4 c++17

## 4.1 Tests table

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **BindingDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.045 | True |
| **CXXDeductionGuideDecl** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **DecompositionDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.049 | True |
| **UsingPackDecl** | 0.01 | True | 0.01 | True | 0 | False | 0.048 | True |
| **auto_structured_binding** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **inline_specifier** | 0.01 | True | 0.01 | True | 0 | False | 0.066 | True |

## 4.2 Success and Fail Rate chart

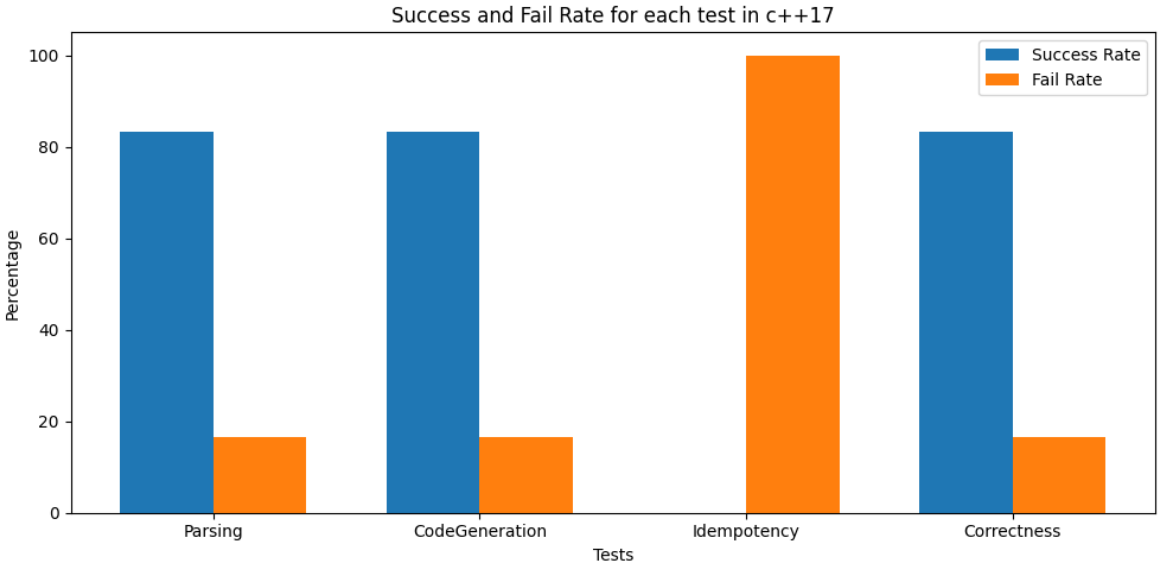


Figure 4: Success and Fail Rate for each test in c++17

# 5 c++20

## 5.1 Tests table

| | Parsing | | CodeGeneration | | Idempotency | | Correctness | |
|---|---|---|---|---|---|---|---|---|
| | Time | Success | Time | Success | Tries | Success | Time | Success |
| **CXXRewrittenBinaryOperator** | 0.01 | True | 0.01 | True | 0 | False | 0.046 | True |
| **CoawaitExpr** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **ConceptDecl** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **ConceptSpecializationExpr** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **CoroutineBodyStmt** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **CoroutineSuspendExpr** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **CoyieldExpr** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **DependentCoawaitExpr** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **RequiresExpr** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **UsingEnumDecl** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **auto_abbrev_func_temp** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **char8_t** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **co_await_NF** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **co_return_NF** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **co_yield** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **concept** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **consteval** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **constinit** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **export** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **private_module** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **requires** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |
| **using_enum** | N/A | False | N/A | N/A | 0 | N/A | N/A | N/A |

## 5.2 Success and Fail Rate chart

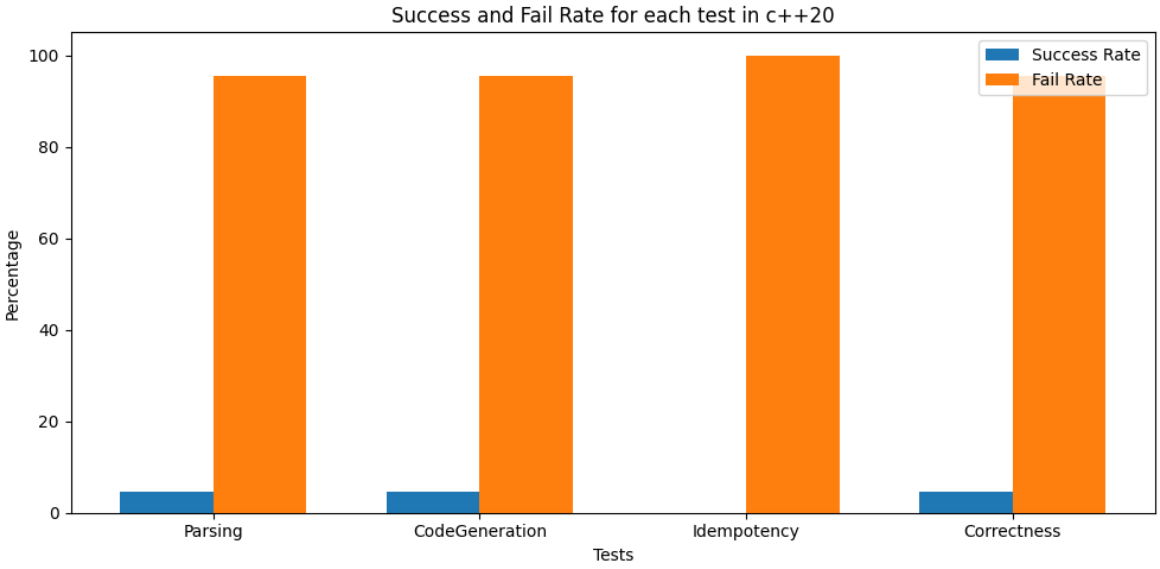


Figure 5: Success and Fail Rate for each test in c++20

# 6 Statistics

## 6.1 Tables

- PT: Denotes the number of passed tests / test phases
- RelP: Denotes the percentage of passed tests / test phases. Phases that were not run are disregarded.
- AbsP: Denotes the absolute percentage of passed tests / test phases. Phases that were not run are counted as failures.

| Standard | Parsing | | Code Gen | | Idempotency | | Correctness | | All | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PT | Rel% | PT | Rel% | PT | Rel% | PT | Rel% | PT | Rel% |
| c++98 | 123 | 100.00 | 123 | 100.00 | 0 | 0.00 | 123 | 100.00 | 369 | 75.00 |
| c++11 | 36 | 92.31 | 36 | 92.31 | 0 | 0.00 | 36 | 92.31 | 108 | 73.47 |
| c++14 | 3 | 100.00 | 3 | 100.00 | 0 | 0.00 | 3 | 100.00 | 9 | 75.00 |
| c++17 | 5 | 83.33 | 5 | 83.33 | 0 | 0.00 | 5 | 83.33 | 15 | 71.43 |
| c++20 | 1 | 4.55 | 1 | 4.55 | 0 | 0.00 | 1 | 4.55 | 3 | 12.00 |

Table 1: Relative percentage of tests passed

| Standard | Parsing | | Code Gen | | Idempotency | | Correctness | | All | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PT | Abs% | PT | Abs% | PT | Abs% | PT | Abs% | PT | Abs% |
| c++98 | 123 | 100.00 | 123 | 100.00 | 0 | 0.00 | 123 | 100.00 | 369 | 75.00 |
| c++11 | 36 | 92.31 | 36 | 92.31 | 0 | 0.00 | 36 | 92.31 | 108 | 69.23 |
| c++14 | 3 | 100.00 | 3 | 100.00 | 0 | 0.00 | 3 | 100.00 | 9 | 75.00 |
| c++17 | 5 | 83.33 | 5 | 83.33 | 0 | 0.00 | 5 | 83.33 | 15 | 62.50 |
| c++20 | 1 | 4.55 | 1 | 4.55 | 0 | 0.00 | 1 | 4.55 | 3 | 3.41 |

Table 2: Absolute percentage of tests passed.

## 6.2 Absolute Percentage of tests passed chart

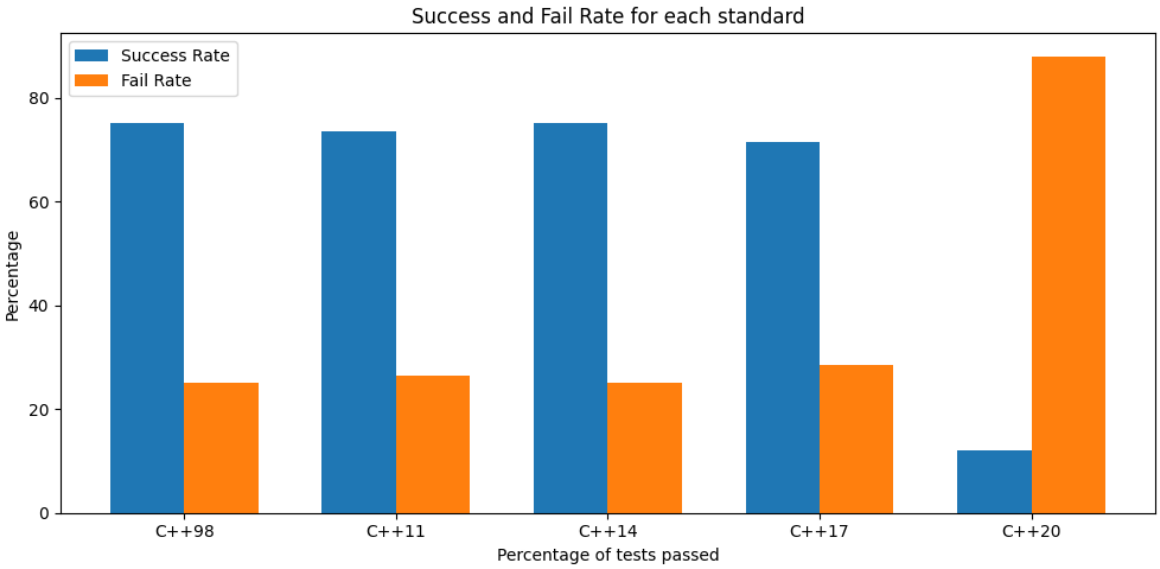


Figure 6: Success and Fail Rate for each standard

## 6.3 Relative Percentage of tests passed chart

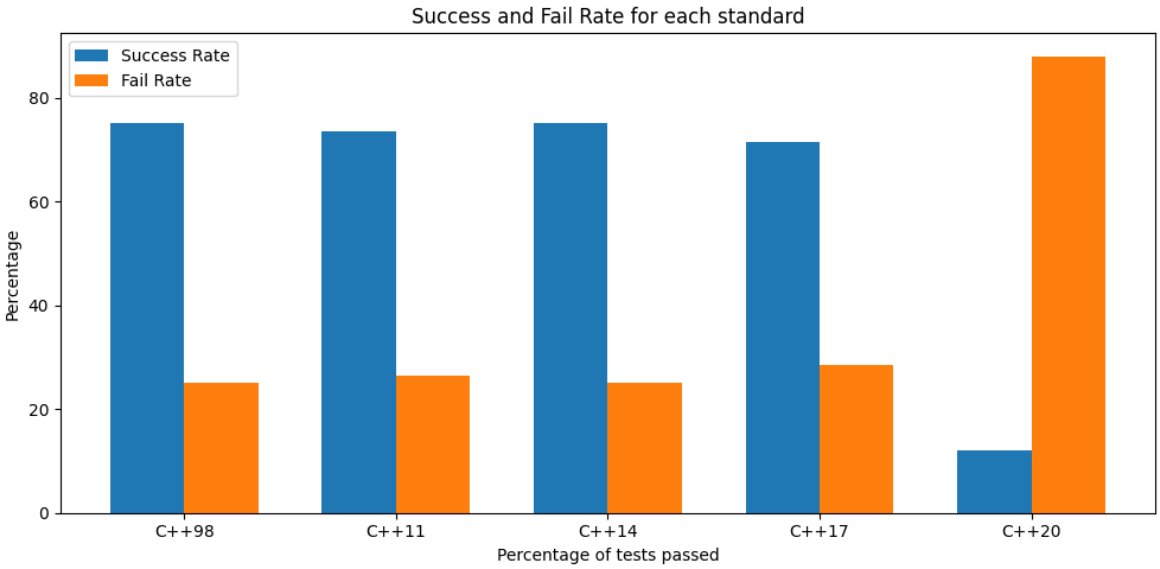


Figure 7: Success and Fail Rate for each standard