

Index

- translation unit (TU)
 - opaque enumerations, 660
 - thread-safe function-scope static variables, 71
- translation-lookaside buffer (TLB), 182n13
- transparently nested namespaces. *See* inline namespaces
- trivial, 38
- trivial classes, 521
- trivial constructors, 273–274, 408n4
- trivial copy constructors, 470, 528n62
- trivial copy operation, 483, 733, 812
- trivial copy-assignment operator, 470
- trivial default constructors, 461
- trivial default initialization, 1087
- trivial destructibility, 468–469
- trivial destructors, 408n4
- trivial move constructors, 484, 528n62
- trivial move operation, 733
- trivial operations, 33
- trivial types
 - in C++17, 425n7
 - fixed-capacity string elements, 476–479
 - future direction of PODs, 438–439
 - generalized PODs, 401, 416–417, 425–429
 - preserving, 39–40
 - requiring, 480–482
 - special member functions and, 1012
 - subcategories, 429–436
 - union membership and, 1174
- triviality, loss of, 329–330
- trivially constructible, 80n7
 - POD types, 431–432
 - secure buffers, 460–462
- trivially copy assignable, 486–487
- trivially copy constructible, 488
- trivially copyable, 39, 41–42
 - C++ Standard not stabilized, 521–527
 - fixed-capacity strings, 470–475
 - ineligible use of `std::memcpy`, 497–501
 - `memcpy` usage on `const` or reference subobjects, 489–493
 - naive copying other than `std::memcpy`, 501–505
 - POD types, 401, 434–436
 - sloppy terminology, 488–489
 - wrong usage of type traits, 482–488
- trivially copyable class, 521
- trivially copyable types, 468
- trivially default constructible, 401, 430–436
- trivially destructible
 - compile-time constructible, literal types, 462–464
 - `constexpr` variables, 305
 - POD types, 402, 430–434
- reducing code size, 1104
- sloppy terminology, 488–489
- trivially destructible types in C++20, 430n9
- true sharing, 183n15
- tuples, 932–937, 975–976
- type aliases. *See also* inheriting constructors; trailing return
 - befriending as customization point, 1034–1036
 - creating with `using` declarations, 133–137
 - description of, 133–134
 - exception specifications and, 1090, 1147
 - use cases, 134–137
 - binding arguments to template parameters, 135–136
 - simplified `typedef` declarations, 134–135
 - type trait notation, 136–137
- ~~type categories~~, 837, 843
- type deduction
 - forwarding references, 379–380
 - of `std::initializer_list`, 559–561
- type erasure, 602
- type identifiers as `alignas` specifier argument, 172
- type inference, 193
- type lists, 963
- type parameter packs, 903
- type punning, 401
- type safety, 100–101
- type suffix, 837
- type template parameter packs, 880–884
- type template parameters, 902
- type traits, 436–438
 - in C++17, 651n12
 - notation, 136–137
 - reducing verbosity, 161–163
 - `static_assert`, 119
 - `std::is_lvalue_reference`, 378
 - as unreliable, 527–528
 - wrong usage, 482–488
- `<type_traits>` header, 1014
- type-consistency, explicit expression of, 27–28, 28n1
- `typedef`. *See also* aliases
 - capturing results of `decltype` expressions in, 31
 - in `<cstdint>`, 92
 - strong implementation, 541–544
- typename disambiguator, 382n1
- typename specifiers, 1032
- typenames
 - explicit, 26–27
 - in `friend` declarations, 1033n1

Index

- types. *See also* POD types; trivial types; type aliases; type safety; type traits; user-defined types (UDTs); value-semantic types (VSTs)
 as **alignof** argument, 193–194
 function pointers and, 265–266
 historical perspective on, 93–94
 literal, 278–284
 local/unnamed
 description of, 83–84
 use cases, 84–87
long long
 description of, 89
 further reading for, 92
 potential pitfalls, 91–92
 use cases, 89–91
 redundant repetition, avoiding, 200–201
 relative sizes of, 91–92
 scalar
 aggregate initialization, 222
 copy initialization, 235–236
 initialization, 217
 trailing return. *See also* **decltype**; deduced return type
 description of, 124–126
 further reading for, 128
 inferring type of, 28
 use cases, 126–128
 underlying types (UTs)
 description of, 829–830
 further reading for, 834
 potential pitfalls, 832–833
 use cases, 830–832
 union
 description of, 1174–1177
 further reading for, 1181
 potential pitfalls, 1180
 use cases, 1177–1180
 variant, 937–948
- U**
- UDL operator templates, 841, 849–851, 870
 UDL operators, 840–842
 cooked, 843–845
 raw, 845–849
 templates, 849–851
 UDL suffix, 837
 UDL type categories, 843
 UDTs. *See* user-defined types (UDTs)
 unconditional exception specifications, 1085–1089
 undefined behavior (UB), 1024n10, 1077, 1104, 1175
 attributes and, 18–19
 auto return-type deduction, 1187
 constexpr variable initializers, 306–307
- contract guarantees, 1115
 delegating constructors, 50n2
 diagnosing at compile time, 312–314
friend declarations, 1049
 generalized PODs, 401
long long integral type, 90
`[[noreturn]]` attribute, 97
 range-based **for** loops, 692
value references, 715
 thread-safe function-scope static variables, 70
 uninitialized values, 218
 union type and, 1180
 undefined symbol links, 1068n4
 undefined symbols, 363
 underlying types (UTs)
 constexpr variables, 308–309
 description of, 829–830
enum class, 337
 enumerations, 333–334
 further reading for, 834
 opaque enumerations, 660
 potential pitfalls, 832–833
 Unicode string literals, 131
 use cases, 830–832
 underspecifying alignment, 176
 unevaluated contexts, `std::declval` used in, 31, 1132
 unevaluated operands, 615
 Unicode string literals
 description of, 129–130
 potential pitfalls, 130–132
 embedding Unicode graphemes, 130–131
 library support, lack of, 131
 UTF-8, problematic treatment of, 131–132
 use cases, 130
 unification, 901
 uniform initialization, 215
 in factory functions, 239–241
 in generic code, 238–239
 member initialization in generic code, 241–242
 union type
 description of, 1174–1177
 discriminated unions, 937–948
 further reading for, 1181
 misuse of, 505–506
 potential pitfalls, 1180
 use cases, 1177–1180
 vertical encoding within, 439–448
 unions
 default member initializers and, 320–321
 final contextual keyword in, 1013
 unique object address, 418