

## C++ Nuts & Bolts

- Compound-assignment operators
- String conversion: `to_string`, `ostringstream`
- Fixed vs. scientific notation
- Field width
- Formatted output using stream manipulators: `fixed`, `scientific`, `setprecision`, `setw`
- `struct`
- Object
- Member, local, global
- Braces-based initialization
- `pair`, `make_pair`
- `map`
  - CRUD operations on a `map`
  - Iterating over a `map`
- Standard Template Library (STL)
- STL algorithms: `sort`, `reverse`, `fill`, `binary_search`, `lower_bound`, `upper_bound`, `find`, `mismatch`, `find_if`
- Iterator arithmetic
- Dereferencing, dereference operator
- Past-the-end iterator
- Lambda function
- Passing a function to an STL algorithm
- Namespace
- Using Standard Library PRNGs: creation, seeding, distributions, passing to an STL algorithm
- File stream
- Error checking for file I/O
- Pointer
- Address, address-of operator
- Null pointer, `nullptr`
- Internal implementation of passing by reference
- Built-in array
- Pointer arithmetic
- Distance between pointers/iterators
- Internal implementation of double-quoted string
- `new` and `delete`
- Array forms of `new`, `delete`

- Undefined behavior
- Bitwise operators: bitwise-AND, bitwise-OR
- Passing flags using a single integer
- Class
- Class definition
- Access specifiers: `public`, `private`
- Member function
- Data member
- Current object
- Constructor
- Overloading
- `const` and objects, pointers, member functions; rules about permissions
- Header & source files for a class

## Other Concepts

- Sequence data, associative data, record data
- Key
- Field of a record
- Lexicographic order
- Associative container
- Sparse sequence
- (Standard) library
- Generic programming
- Generic container
- Iterator
- Name conflict
- Random vs. pseudorandom numbers
- Pseudorandom number generator (PRNG)
- Seeding a PRNG
- I/O, console I/O, file I/O
- File, file system, filename, directory, mass storage device
- Text file vs. binary file
- Sequential-access file vs. random-access file, record
- File operations: open, read, write, seek, flush, close
- File metadata
- EOF
- Valid data

- Dynamic, static
- Allocation, deallocation
- Memory leak
- Binary (base-two) numbers
- Place (in a number system)
- Bit, byte
- Processor
- 32-bit vs. 64-bit system
- Kilobyte, megabyte, gigabyte, terabyte
- Two's complement
- Sign bit
- Naming data members