C++ Club Meeting Notes

Gleb Dolgich

2019-07-11

Herb Sutter: Your “top five” ISO C++ feature proposals

https://herbsutter.com/2019/07/11/your-top-five-iso-c-feature-proposals/

Survey: https://www.surveymonkey.com/r/ZDCD6YV

Pre-Cologne papers: http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2019/#mailing2019-06

Elements of Programming Authors’ Edition (free ebook)

http://componentsprogramming.com/elements-of-programming-authors-edition/

https://www.reddit.com/r/cpp/comments/c6fjjg/elements_of_programming_authors_edition/

> *Alex Stepanov and Paul McJones have just released Elements of Programming Authors’ Edition.*

PDF download:

http://elementsofprogramming.com/

C++17 - The Complete Guide by Nicolai Josuttis

https://leanpub.com/cpp17

CLion 2019.2 EAP: MSVC Debugger, Unused Includes Check, and More

https://blog.jetbrains.com/clion/2019/06/clion-2019-2-eap-msvc-debugger-unused-includes-check-and-more/

- Experimental feature: LLDB-based Debugger for the Microsoft Visual C++ toolchain
- The ‘unused includes’ check is back
- Memory view: ASCII view
- Better performance for code completion

https://www.reddit.com/r/cpp/comments/c5vnhw/clion_20192_eap_brings_experimental_lldbbased/

A dbg(...) macro for C++

https://github.com/sharkdp/dbg-macro

https://www.reddit.com/r/cpp/comments/c2ysa7/a_dbg_macro_for_c/

https://doc.rust-lang.org/std/macro.dbg.html

Algorithms/Data Structure course for C++

- Stanford CS106B - Programming Abstractions
- MIT 6.006 Introduction to Algorithms, Fall 2011
- MIT 6.046J Design and Analysis of Algorithms, Spring 2015
- Alex Stepanov Efficient Programming with Components
- Udemy Mastering Data Structures & Algorithms using C and C++

mimalloc

Microsoft **mimalloc** is a compact general purpose allocator with excellent performance.

https://github.com/microsoft/mimalloc

https://www.reddit.com/r/programming/comments/c3ox2r/mimalloc_is_a_compact_general_purpose_allocator/

Mimalloc: Free List Sharding in Action

Serenity OS

https://github.com/SerenityOS/serenity (BSD-2-Clause)

https://www.reddit.com/r/programming/comments/c13vph/serenityos_a_marriage_between_the_aesthetic_of/

Serenity OS Patterns: The Badge

(aka The Client-Attorney Idiom)

https://awesomekling.github.io/Serenity-C++-patterns-The-Badge/

- Reddit
- SO: Granular friend
    - Live code: http://ideone.com/7n1Wwz
- Dr. Dobbs - Friendship and the Attorney-Client Idiom

```cpp
template<typename T>
class Key { friend T; Key(){} Key(Key const&){} };
class Foo;
class Bar { public: void special(int a, Key<Foo>); }; // protected API
class Foo { public: void special() { Bar().special(1, {}); } };

// At call site
Foo().special();       // OK
Bar().special(1, {}); // Error: Key<Foo> ctor is private
```

Catching use-after-move bugs with Clang's consumed annotations

Article by Andreas Kling | Reddit

- ▶ Clang consumed annotation checking

```cpp
class [[clang::consumable(unconsumed)]] CleverObject {
public:
  CleverObject() {}
  CleverObject(CleverObject&& other) { other.invalidate(); }
  [[clang::callable_when(unconsumed)]]
  void do_something() { assert(m_valid); }
private:
  [[clang::set_typestate(consumed)]]
  void invalidate() { m_valid = false; }
  bool m_valid { true };
};
```

- ▶ Clang-tidy bugprone-use-after-move

What are some uses of decltype(auto)?

https://stackoverflow.com/questions/24109737/what-are-some-uses-of-decltypeauto

- https://stackoverflow.com/a/24109800/10154
- https://stackoverflow.com/a/24109944/10154

LibTom

https://www.libtom.net/

https://github.com/libtom/libtomcrypt

The Power of Hidden Friends in C++

Article by Anthony Williams

https://www.justsoftwaresolutions.co.uk/cplusplus/hidden-friends.html

```cpp
namespace A{
  class X{
  public:
    X(int i):data(i){}
  private:
    int data;
    friend bool operator==(X const& lhs,X const& rhs){
      return lhs.data==rhs.data;
    }
  };
}
```

How to try the new coroutines TS?

https://www.reddit.com/r/cpp/comments/c6ag3l/how_to_try_the_new_coroutines_ts/

MSVC

```
/await /std:c++latest
```

Clang

```
-std=c++2a -stdlib=libc++ -fcoroutines-ts
```

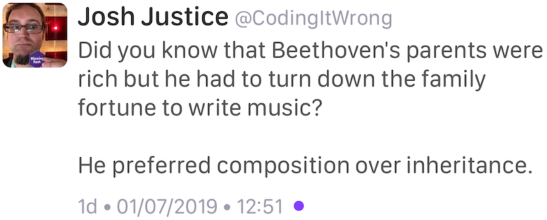
- CppCoro - https://github.com/lewissbaker/cppcoro
- coroutine - https://github.com/luncliff/coroutine
- continuable - https://github.com/Naios/continuable

Discussion: member variable naming

https://www.reddit.com/r/cpp/comments/c6rnel/discussion_member_variable_naming/

- `m_foo`
- `foo_`
- `_foo`

Twitter



Josh Justice @CodingItWrong

Did you know that Beethoven's parents were rich but he had to turn down the family fortune to write music?

He preferred composition over inheritance.

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