# C++ Club UK Meeting 108

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- Stack Overflow

The flight software is written in C/C++ and runs in the x86 environment.

They use Chromium and JavaScript for the Dragon 2 flight interface. The actual flight computers still run on C++.

- Falcon 9 and Crew Dragon launch video (YouTube)

- Michele Caini
    - Reddit

- Jonathan Müller
  - Reddit

# Rvalue Ranges and Views in C++20

- Tristan Brindle
  - Reddit

- Jussi Pakkanen
    - Reddit

# Let's unravel the secrets behind C++17's structured bindings

- Jean Guegant
  - Reddit

- Reddit

# The C++ preprocessor doesn't understand anything about C++, and certainly not templates

- Raymond Chen
  - Reddit

## How to modify a key in C++17 with **std::map::extract**

```cpp
std::map<int, std::string> m {
                {1, "dog"},
                {2, "cat"},
                {3, "cow"}};
```

Changing a **key** of an element e.g. {**2**, "cat"} isn't trivial, as it involves changes to the internal structure of the map's self-balancing binary tree.

```cpp
auto it = m.find(2);
if(it != m.end()) {
        auto s = it->second;
        m.erase(it);
        m.insert({7, s});
}
```

**Before C++17**, we had to erase the node and insert a new one. That required an **extra allocation** and **deallocation.**

```cpp
auto nh = m.extract(2);
if(!nh.empty()){
    nh.key() = 7;
    m.insert(std::move(nh));
}
```

**C++17** introduced **extract()** which unlinks the node and returns the node handle **nh** that can modify the key. No elements are copied or moved, only internal pointers get repointed.

More info: H.Sutter, More Exceptional C++, Item 8; P0083                @walletfox

- GitHub (Header-only, MIT, C++11)
  - V1.6.0
  - Reddit

- GitHub
  - Reddit: Catch2 now uses statically compiled library as its distribution model

- Viktor Zverovich
  - Reddit
- Bloaty McBloatface: A size profiler for binaries (Google)

- YouTube
- PDF
- Reddit

- Article
  - Reddit

- Article
  - Reddit 1
  - Reddit 2

- Article
  - Reddit
- polymorphic_value (GitHub)
- Better Code: Runtime Polymorphism - Sean Parent

- Filip Dutescu (GitHub)
  - Reddit

A template for modern C++ projects using CMake, clang-format and unit testing

- Bartek Filipek
  - Reddit

- Julien Jorge

(*Don't write on Medium – GD*)

Titus Winters:

> *Software engineering is programming integrated over time.*

'No Bugs' Hare @NoBugsHare

Don't code today what you can't debug tomorrow.

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