

Software Development with C++

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Our Aim: "mpags-cipher"

Develop a command line application using the C++ programming language to encrypt/decrypt simple text messages using classical ciphers.

Requirements

- Read Plaintext from Keyboard or File
- User select of Cipher, Key and whether to Encrypt/Decrypt
- Provide Encryption/Decryption via
 - Caesar Cipher
 - Playfair Cipher
 - Vigenere Cipher
- Write cipher text to Screen or File





lambdas

```
[] {foo();}
```

constexpr

initializer lists

regex

C++11

nullptr

```
std::shared_ptr<T>  
std::unique_ptr<T>  
std::weak_ptr<T>
```

```
auto i = v.begin();  
  
for(x : collection)
```

“Not Your Parents’ C++” - Herb Sutter

lambdas

```
[ ] {foo();}
```

constexpr

initializer lists

regex

C

++

98

nullptr

```
shared_ptr<T>,  
unique_ptr<T>,  
weak_ptr<T>
```

```
auto i = v.begin();
```

```
for(x : collection)
```

“Your Parents’ C++” - still much existing code

generic lambdas

```
[](auto x){foo(x);}
```

C++

binary literals

```
auto bin = 0b0100;
```

digit separators

```
auto i = 1'000;
```

deduced return types

```
auto myFunc();
```



string views

`std::string_view`

C

++



**filesystem
operations**

`std::filesystem`

structured bindings

`auto [ first, second ] = myPair;`

parallel algorithms

**mathematical
constants**

`std::numbers::pi`

(+ +



concepts

`std::movable`
`std::floating_point`

using enum

**associative
contains**

`if ( myMap.contains(2) )`

1. Procedural C++

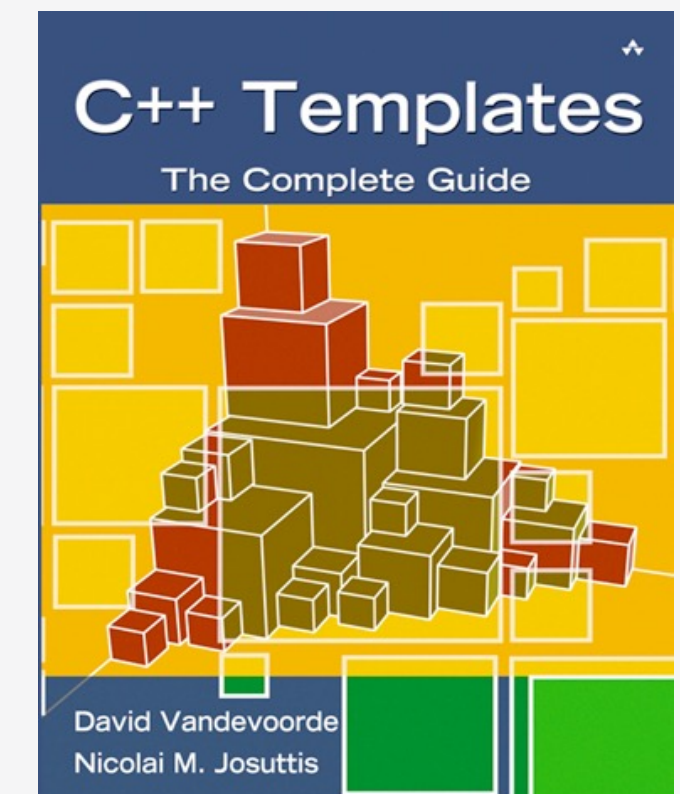
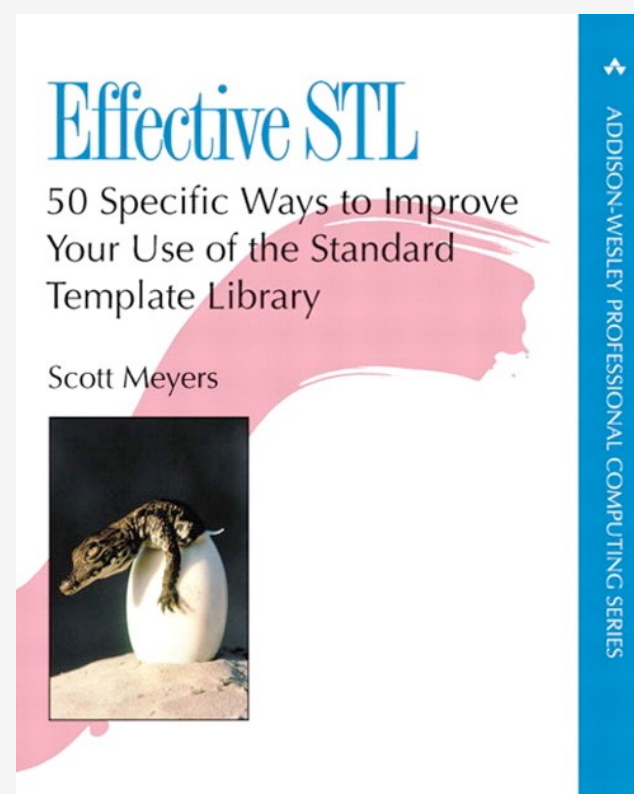
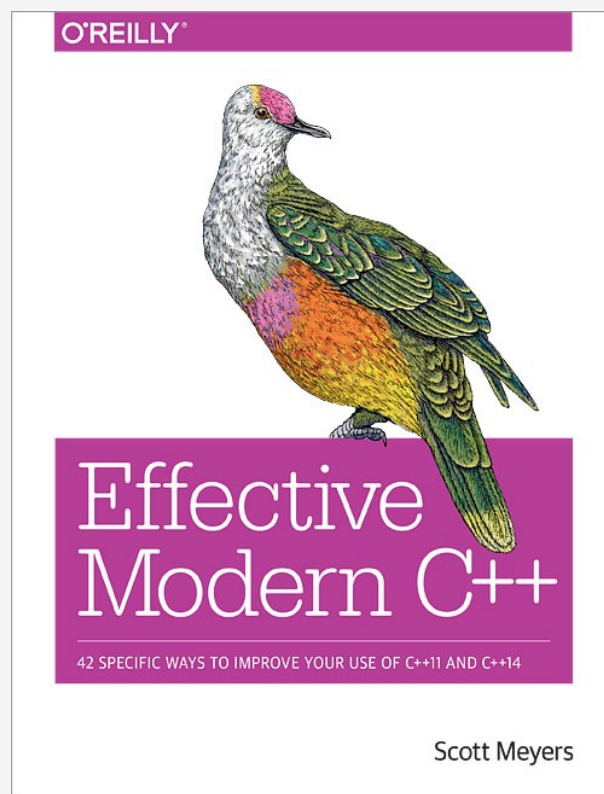
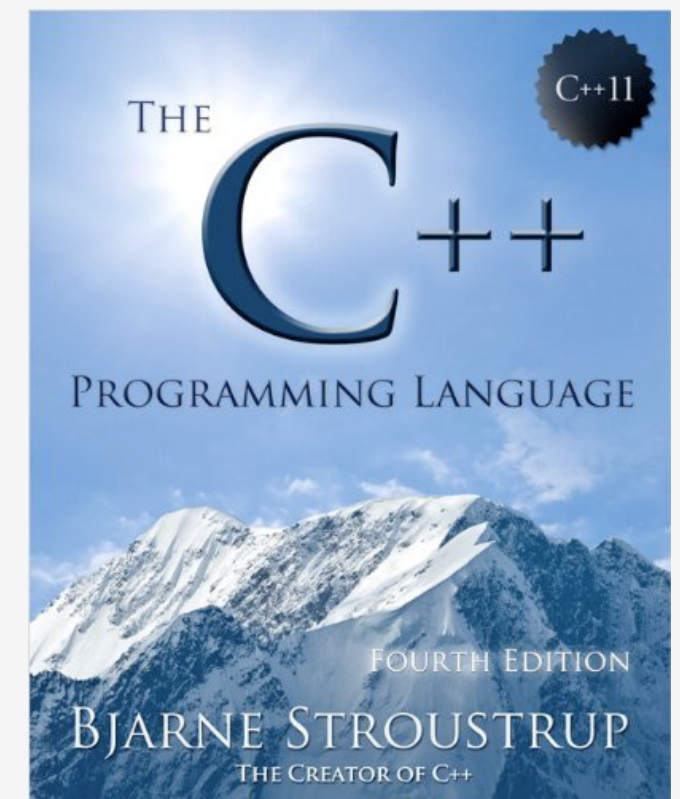
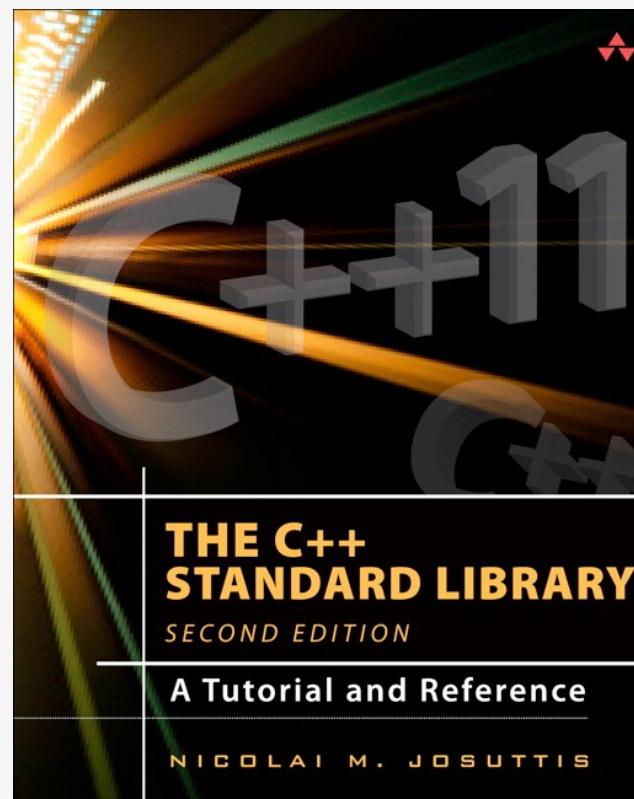
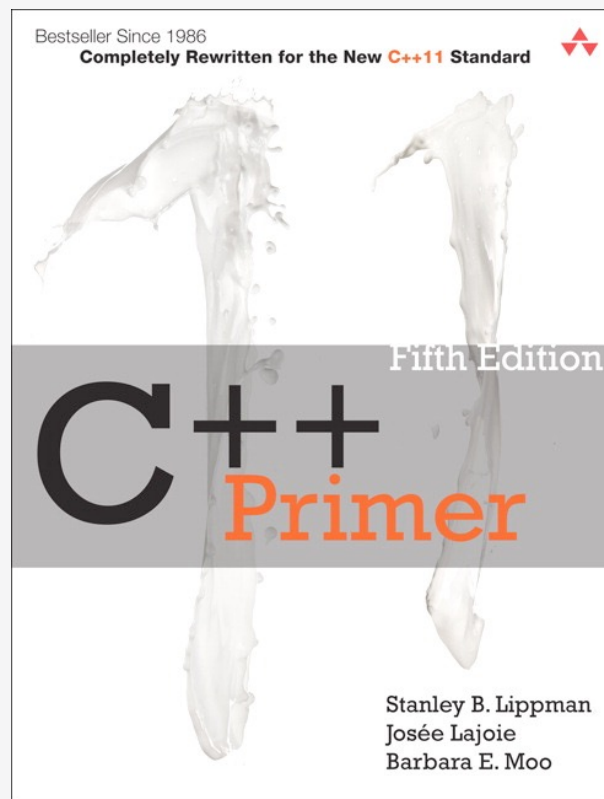
```
int main(int argc, char *argv[])
{
    int result = calculate_foo();
    return 0;
}
```

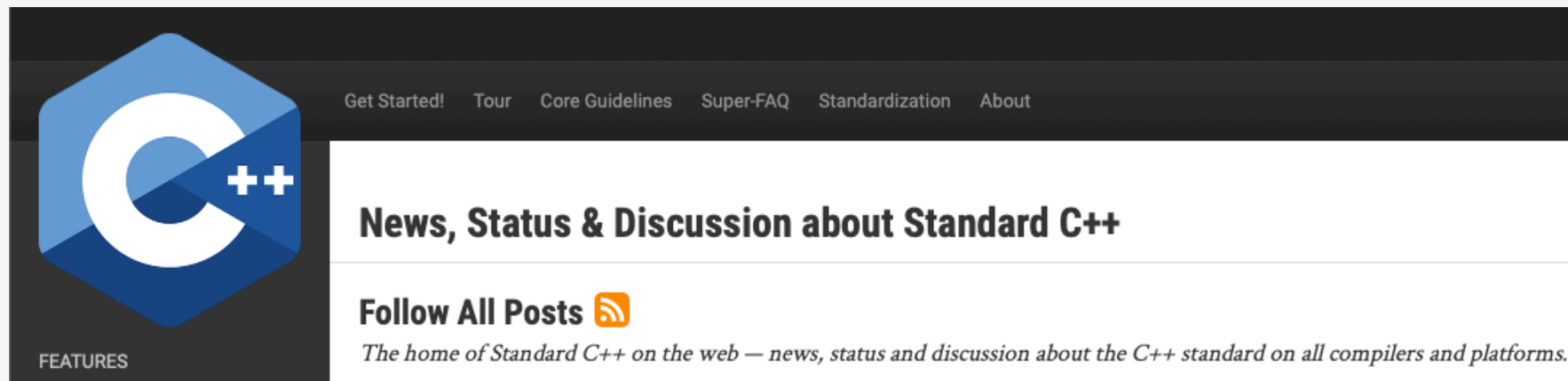
2. Object Oriented C++

3. Generic C++

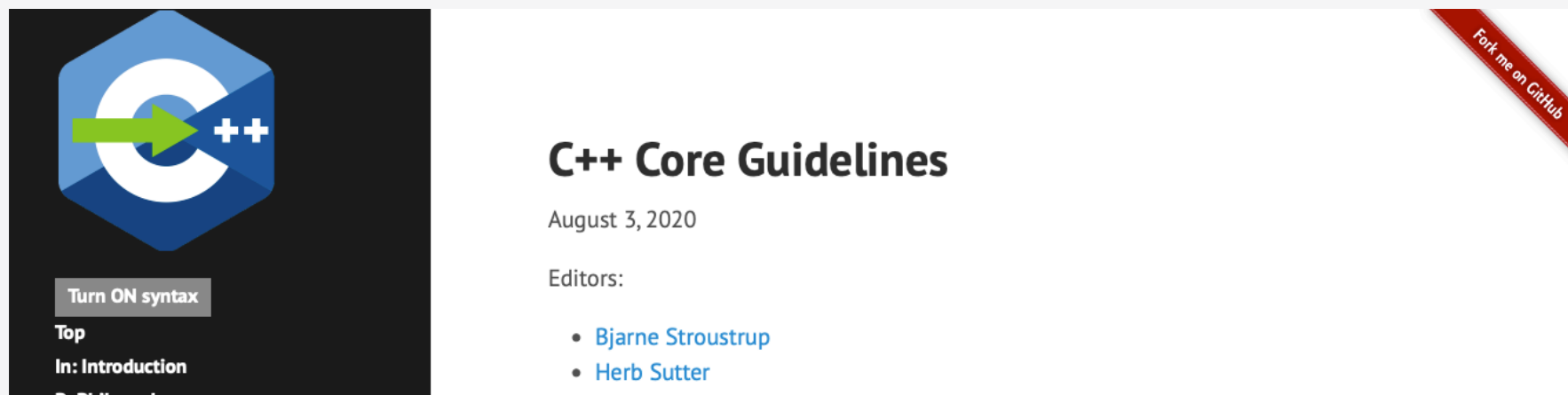
```
int main(int argc, char *argv[])
{
    FooCalculator foo;
    int result = foo.calculate();
    return 0;
}
```

C++ Programming Stream





Programmers Q&A



C++ Online Resources





1. Storing code and changes
(***Git***)



2. Automating builds
(***Compiler/CMake***)



3. Testing (***CMake/Catch2***)

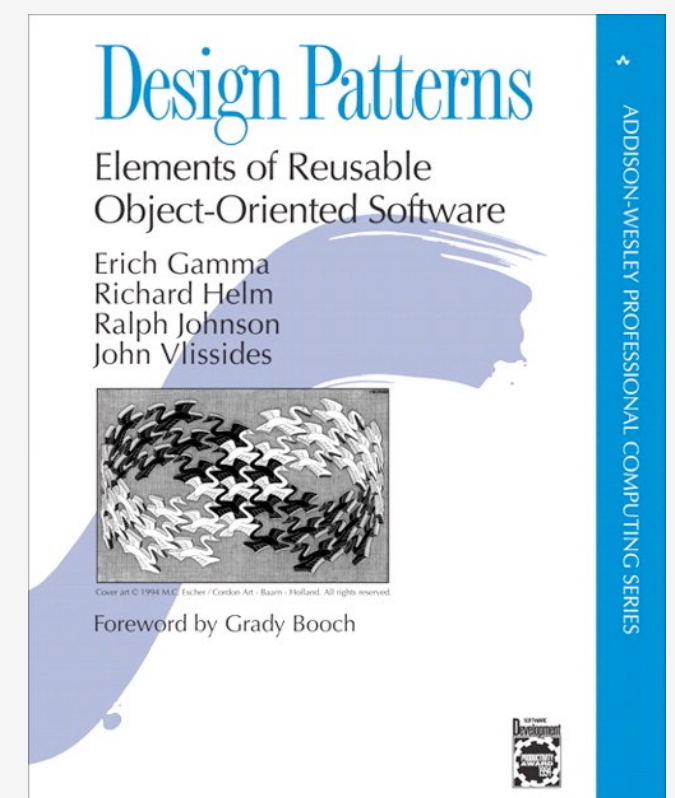
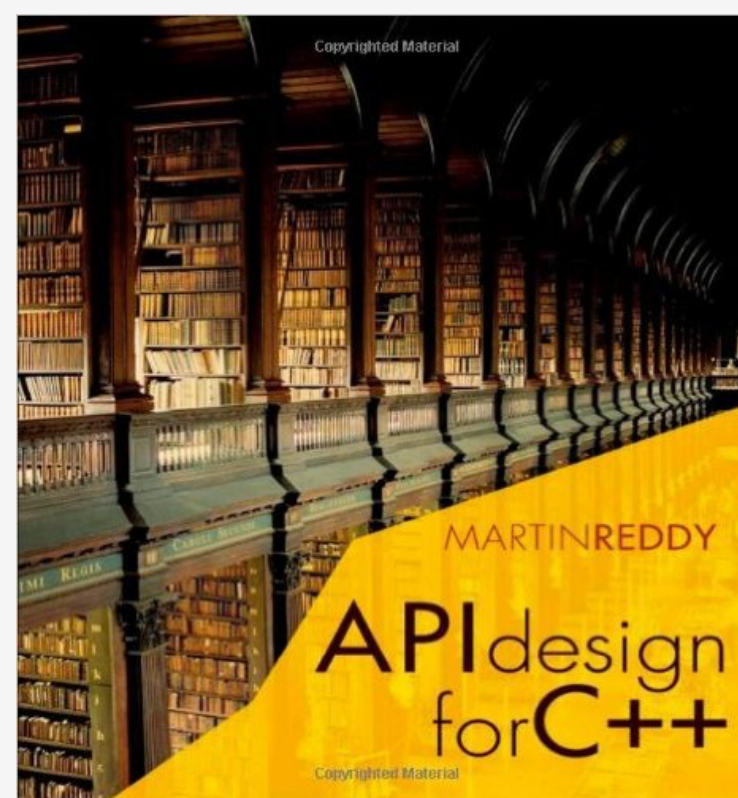
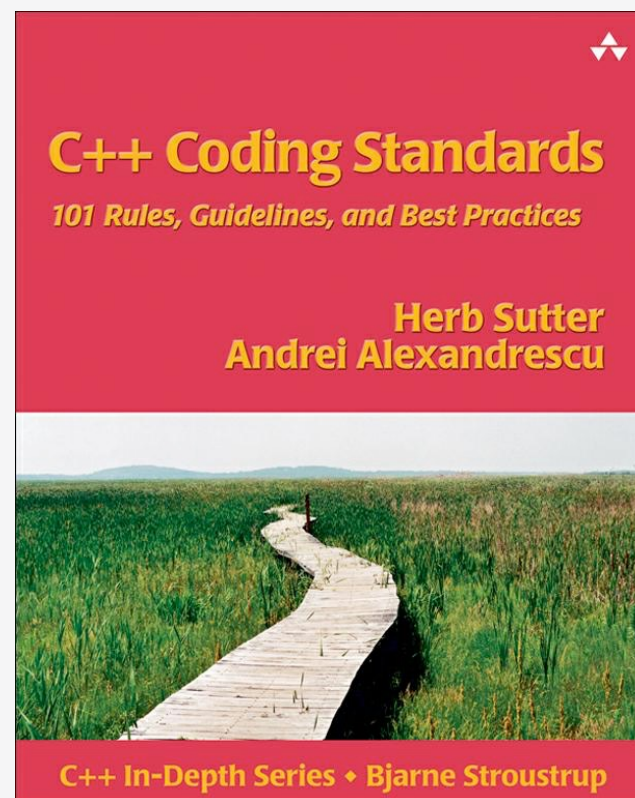
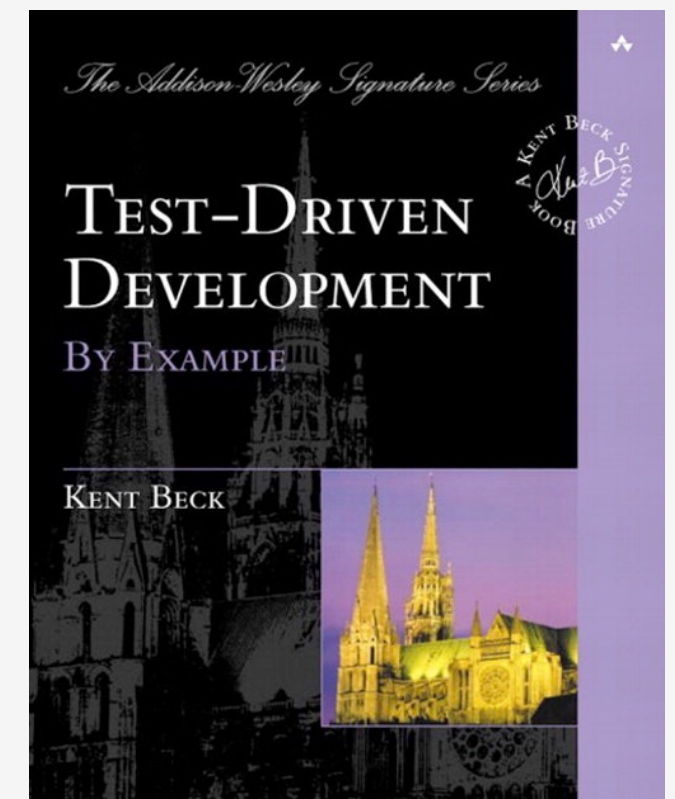
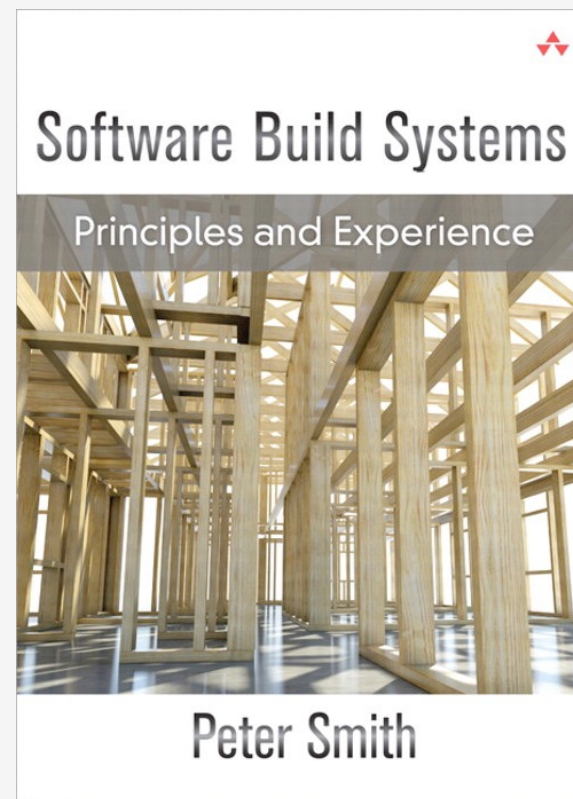
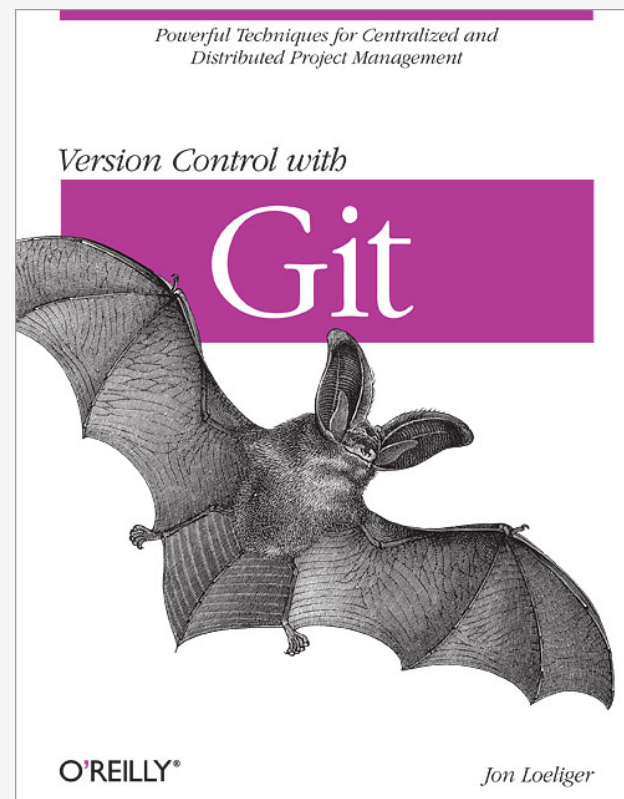


4. Documenting code and programs (***Doxygen***)



5. *Software Design*

Software Development Stream



Software Development Bookshelf


git --distributed-is-the-new-centralized

Git is a **free and open source** distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Git is **easy to learn** and has a **tiny footprint with lightning fast performance**. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like **cheap local branching**, convenient **staging areas**, and **multiple workflows**.




CMake » latest release (3.18.3) Documentation »
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[cmake\(1\)](#)

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Quick search

Introduction

CMake is a tool to manage building of source code. Originally, CMake was designed as a generator for various dialects of `Makefile`, today CMake generates modern buildsystems such as `Ninja` as well as project files for IDEs such as Visual Studio and Xcode.

CMake is widely used for the C and C++ languages, but it may be used to build source code of other languages too.

People encountering CMake for the first time may have different initial goals. To learn how to build a source code package downloaded from the internet, start with the [User Interaction Guide](#). This will detail the steps needed to run the `cmake(1)` or `cmake-gui(1)` executable and how to choose a generator, and how to complete the build.

The [Using Dependencies Guide](#) is aimed at developers wishing to get started using a third-party library.



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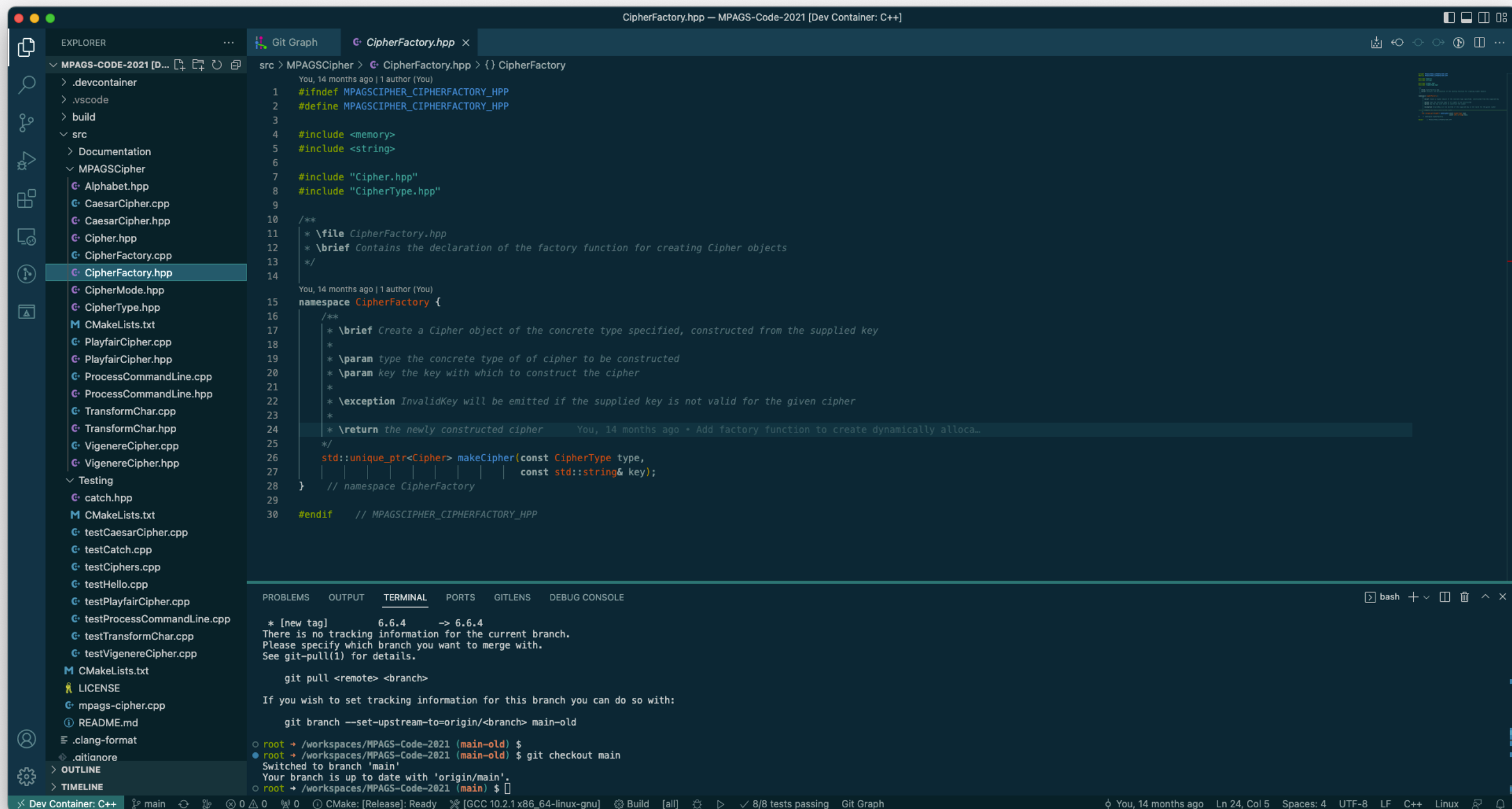
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Getting Started

```
$ mpags-cipher --help  
> questions?  
> comments?
```