

# Beautiful C++

# Beautiful C++: 30 Core Guidelines for Writing Clean, Safe, and Fast Code

# **Table of Contents**

Cover

Half Title

Title

Copyright

Dedication

Contents

List of Selected C++ Core Guidelines

Foreword

Preface

Acknowledgments

About the Authors

Section 1 Bikeshedding is bad

Chapter 1.1 P.2: Write in ISO Standard C++

Chapter 1.2 F.51: Where there is a choice, prefer default arguments over overloading

Chapter 1.3 C.45: Dont define a default constructor that only initializes data members; use in-class member initializers instead

Chapter 1.4 C.131: Avoid trivial getters and setters

Chapter 1.5 ES.10: Declare one name (only) per declaration

Chapter 1.6 NR.2: Dont insist to have only a single return-statement in a function



# **Table of Contents**

#### Section 2 Dont hurt yourself

- Chapter 2.1 P.11: Encapsulate messy constructs, rather than spreading through the code
- Chapter 2.2 I.23: Keep the number of function arguments low
- Chapter 2.3 I.26: If you want a cross-compiler ABI, use a C-style subset
- Chapter 2.4 C.47: Define and initialize member variables in the order of member declaration
- Chapter 2.5 CP.3: Minimize explicit sharing of writable data
- Chapter 2.6 T.120: Use template metaprogramming only when you really need to

#### Section 3 Stop using that

- Chapter 3.1 I.11: Never transfer ownership by a raw pointer (T\*) or reference (T&)
- Chapter 3.2 I.3: Avoid singletons
- Chapter 3.3 C.90: Rely on constructors and assignment operators, not memset and memcpy
- Chapter 3.4 ES.50: Dont cast away const
- Chapter 3.5 E.28: Avoid error handling based on global state (e.g. errno)
- Chapter 3.6 SF.7: Dont write using namespace at global scope in a header file

#### Section 4 Use this new thing properly

- Chapter 4.1 F.21: To return multiple out values, prefer returning a struct or tuple
- Chapter 4.2 Enum.3: Prefer class enums over plain enums
- Chapter 4.3 ES.5: Keep scopes small
- Chapter 4.4 Con.5: Use constexpr for values that can be computed at



### **Table of Contents**

#### compile time

Chapter 4.5 T.1: Use templates to raise the level of abstraction of code

Chapter 4.6 T.10: Specify concepts for all template arguments

#### Section 5 Write code well by default

Chapter 5.1 P.4: Ideally, a program should be statically type safe

Chapter 5.2 P.10: Prefer immutable data to mutable data

Chapter 5.3 I.30: Encapsulate rule violations

Chapter 5.4 ES.22: Dont declare a variable until you have a value to initialize it with

Chapter 5.5 Per.7: Design to enable optimization

Chapter 5.6 E.6: Use RAII to prevent leaks

Envoi

Afterword

Index