

C++ OOP Interview Checklist (Basic → Advanced)

A complete checklist of the most important C++ OOP topics asked in modern interviews.

Use this as a roadmap while learning and practicing.

1. Basics of OOP

- What is Object-Oriented Programming?
- Class vs Object
- Structure vs Class (default access, OOP usage)
- Access specifiers: public, private, protected
- Encapsulation & data hiding
- Abstraction (what to expose vs hide)

2. Constructors & Destructors

- Default constructor
- Parameterized constructor
- Copy constructor
- Move constructor
- Constructor initialization list
- Delegating constructors
- Destructor (when it's called)
- Order of constructor/destructor calls
- Virtual destructor

3. Copying & Assignment

- Copy constructor vs copy assignment operator
- Deep copy vs shallow copy
- Rule of Three / Rule of Five / Rule of Zero
- Deleted copy operations

4. Memory & Resource Management

- new/delete, new[]/delete[]
- Raw vs smart pointers
- unique_ptr, shared_ptr, weak_ptr
- RAI
- References vs pointers
- Dangling pointers & leaks

5. Static Members

- Static variables
- Static functions
- Static initialization order

6. Operator Overloading

- Arithmetic operators
- Assignment operator
- Comparison operators
- Stream operators (<<, >>)
- Friend functions

7. Inheritance

- Single, multiple, multilevel, hierarchical inheritance
- Virtual inheritance (diamond problem)
- Access control in inheritance
- override, final keywords

8. Polymorphism

Compile-time:

- Function overloading
- Operator overloading

Runtime:

- Virtual functions
- Pure virtual functions
- Abstract classes
- Vtable/vptr concepts
- Covariant return types

9. Templates

- Function templates
- Class templates
- Template specialization
- CRTP (advanced)
- Template vs virtual polymorphism

10. Exception Handling

- try/catch/throw
- Exception safety
- Stack unwinding
- RAI for safety

11. Design & UML

- IS-A vs HAS-A
- Composition vs aggregation
- SOLID basics

12. Common Pitfalls

- Non-virtual destructor in base class

- Object slicing
- Shallow copy mistakes
- Hidden overloads
- Memory leaks

13. Modern C++ Add-ons

- auto, decltype
- enum class
- = delete, = default
- Move semantics
- Lambdas
- final and override
- Strong typing