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

- RAII

- 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

- RAII 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