

# C++ Topics of discussion

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### Topic 01: Basics of C++

- Keywords and Identifiers
- Preprocessor Directives
- Comments
- main()
- Namespaces
- Basic I/O

### Topic 02: Arrays & Vectors

- Variables
- Datatypes
- Arrays
- Vectors

### Topic 03: Operators

- Assignment
- Arithmetic
- Increment and Decrement
- Equality
- Relational
- Logical
- Compound Assignment
- Precedence

### Topic 04: Flow Control & C++ Strings

- Decision making
- Iteration
- continue & break
- Strings
  - C-style strings
  - C++ strings

### Topic 05: Functions

- Function definition
- Function call
  - Pass by value
  - Pass by reference

Recursion

Overloading functions : polymorphism

### **Topic 06: Pointers & References**

Pointer

What is a pointer?

Declaration & Initialization

Dereferencing a pointer

Passing and returning pointers to a function

Pointer arithmetics

Pointer to pointer

Const and pointers

Pointer pitfalls

Reference

### **Topic 07: Object-Oriented Programming**

Procedural Oriented Programming vs Object Oriented Programming

Classes and objects

Creation of Class and Objects

Accessing Class members

Access Specifiers

Methods

Constructors and Destructors

Overloading Constructors

Delegating Constructors

Copy Constructor

Shallow copy & Deep copy

this pointer

Static class members

Structure vs Classes

Friend of a Class

### **Topic 08: Operator Overloading**

Operator overloading (type of polymorphism)

Overloading assignment operator

Operator overloading as member function

Operator overloading as global function

### **Topic 09: Inheritance**

Inheritance

Access rights

Constructors and Destructors

Static binding of method calls

Multiple inheritance

### **Topic 10: Polymorphism**

Polymorphism

Compile time

Run time

Virtual Functions

Virtual destructors

Override Specifier

Final Specifier

### **Topic 11: Smart Pointers**

Issues with raw pointers

C++ smart pointers

Unique pointers

Shared pointers

Weak pointers

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