INTRODUCTION TO C++

CHAPTER 2

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Our content is
divided into the given topics.
Each part will be described in the slides
that follow

C++

- Bjarne Stroustrup developed the C++ programming language at AT&T Bell Laboratories in the early 1980s. He extended the C with the class construct features from Simula 67.
- Bjarne Stroustrup called it “C with classes” originally. The name C++ (pronounced C plus plus) was coined by Rick Mascitti where “++” is the increment operator. Even since its birth C++ evolved to cope with problems encountered by user and through discussion at AT&T.
- During the early 1990’s, the language underwent a number of improvements and changes. In november 1997, the ANSI/ISO standards committee standardized these changes and added several new features to the languages specification.
- The object oriented features in C++ allows programmers to create large programs with clarity, extensibility and easy to maintenance, incorporating the spirit and efficiency of C.

NEED OF C++

- Bjarne Stroustrup said, “C makes it easy to shoot yourself in the foot; C++ makes it harder, but when you do, it blows away your whole leg”. And it is rightly so because, as much as amazing C is, it has its limitations.
- C cannot handle complexity. In solving problems for larger programs, the developer had tough time grasping the totality.
- Also data that are globally declared can be accessed by functions other than the function declared for. These are just few examples of C limitations.
- The features of C++ gives an elaborate idea of why it is needed.
- With an intention to solve these problems, Bjarne Stroustrup invented C++ in 1980s. C++ is nothing but C with Classes. It adds object oriented features in C, which means C++ has all features and benefits of C.

FEATURES OF C++

1. **Namespace:** The namespace is used for the logical grouping of program elements like variables, classes, functions, etc. If some program elements are related to each other, they can be put into a single namespace. The namespace helps to localize the name of identifiers so that there is no naming conflict across different modules designed by different members of programming team.
2. **Derived Classes:** New classes can be formed from the existing classes. The existing classes that are used to derive new classes are called base classes. When a class is derived from a base class, the derived class inherits all the characteristics of base class and add new features as refinements and improvemnets.

FEATURES OF C++

3. **Access Controllers:** *private, public* and *protected* keywords are used for access controll of members within class.
    - private: accessible to member functions within the class only; hidden from other parts of the program
    - public: accessible to any part of the program
    - protected: accessible to the function of derived classes too
4. **Constructor and Destructor:** A constructor is a special member function of a class whose task is to allocate the required memory for members as well as initialize the objects of its class. It has the same name as its class. When an object is no longer needed, it can be destroyed by a special member function called destructor.

FEATURES OF C++

5. **Friend Function and Classes:** Non-member function of a class cannot access the private members of a class from outside the class but using friend function, we can access even the private members of a class. To access all the hidden members of a class, by another class, the class as a whole can be declared as a friend.
6. **Function Overloading:** When the same name is used for different operations, it is called function overloading. When an overloaded function is invoked, the function with matching arguments(number and types) is called. This is useful for manipulating same nature of problems but with different numbers of arguments or types.

FEATURES OF C++

7. **Default arguments:** If we do not supply any argument during a function call, the default value is passed as argument in the absent argument in function call. The default value are specified when function is declared and is specified as similar to variable initialized.
8. **Inline Function:** To save the execution time for small functions, we can put the code of the function body directly in the line of called location. Meaning that, in each function call, the codes in the called function get inserted at the line of call instead of jumping from calling function to called function and back to calling function again.

FEATURES OF C++

9. **Operator Overloading:** The operators such as +, -, +=, >, >>, etc. are designed to operate only on standard data types. However, through operator overloading feature, we can extend the meaning of the operators to operate on user defined types. For example, the operator + can be used to perform addition operation on user defined data such as string concatenation, complex number addition, etc.
10. **Easier way of memory management:** C++ provides *new* operator for dynamic memory allocation and *delete* operator for dynamic memory deallocation.

EXPLORE YOURSELF

- C vs C++
- History of C++

THANK YOU