



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER

19ECT312/Embedded system
Design / Ramya E/AP/ECE/SNSCT

1

UNIT 3 – PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C++



What is embedded C++?



- Embedded C++ is a dialect of C++ that engineers developed in the late 1990s for embedded systems.
- Embedded engineers do use C++ in embedded systems a lot.



What is the difference between embedded C++ and C++?



- Embedded engineers developed "embedded C++" for embedded systems with as low as 4kB of RAM memory and a microcontroller processor
- The language tried to keep valuable C++ concepts while removing features that increased memory requirements and reduced the processor's efficiency



What are the features of embedded C++?



- Embedded C++ (EC++) is a dialect of the C++ programming language for embedded systems
- It was defined by an industry group led by major Japanese central processing unit (CPU) manufacturers, including NEC, Hitachi, Fujitsu, and Toshiba, to address the shortcomings of C++ for embedded applications.



Why C++ is good for embedded systems?



- C++ works well for embedded programming because it sits close to the system hardware
- C++ has pretty much everything that C does, but much more: an array of higher-level language features, including object-oriented programming and type-safe cast that helps to avoid unpleasant memory access errors.

Advantages of C++ for embedded systems



- Ease of use
- Portability
- Standard library
- Stability
- Gateway language
- Support
- Good for GUIs



disadvantages of C++ for embedded



- Hard to learn
- Codebase obstacles
- Potential performance issues
- Memory management challenges



Five Basic Concepts of C++



•C++ Variables

- Variables are the backbone of any programming language.
- A variable is merely a way to store some information for later use. We can retrieve this value or data by referring to a “word” that will describe this information.
- Once declared and defined they may be used many times within the scope in which they were declared.



Five Basic Concepts of C++



- **C++ Control Structures**

- When a program runs, the code is read by the compiler line by line (from top to bottom, and for the most part left to right). This is known as “**code flow.**”

- When the code is being read from top to bottom, it may encounter a point where it **needs to make a decision**. Based on the decision, the program may jump to a different part of the code. It may even make the compiler re-run a specific piece again, or just skip a bunch of code.



Five Basic Concepts of C++



- **C++ Data Structures**

- Let's use a list of courses on "guru99" as the example! You probably have a list of courses in front of you. But how do you think they stored that. There can be a lot of courses, and different users may register for different courses. Do they generate a different variable for each user? For example, let's say we need to keep track of 10 courses.



Five Basic Concepts of C++



•C++ Syntax

- The syntax is a layout of words, expression, and symbols.
- Well, it's because an email address has its well-defined syntax. You need some combination of letters, numbers, potentially with underscores (_) or periods (.) in between, followed by an at the rate (@) symbol, followed by some website domain (company.com).
- So, syntax in a programming language is much the same. They are some well-defined set of rules that allow you to create some piece of well-functioning software.
- But, if you don't abide by the rules of a programming language or syntax, you'll get errors.



Five Basic Concepts of C++



•C++ Tools

- In the real world, a tool is something (usually a physical object) that helps you to get a certain job done promptly.
- Well, this holds true with the programming world too. A tool in programming is some piece of software which when used with the code allows you to program faster.
- There are probably tens of thousands, if not millions of different tools across all the programming languages.
- Most crucial tool, considered by many, is an IDE, an **Integrated Development Environment**. An IDE is a software which will make your coding life so much easier. IDEs ensure that your files and folders are organized and give you a nice and clean way to view them.



THANK YOU