SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER

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

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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