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# Top 30+Embedded C Interview Question and Answers 2025

By [Great Learning Editorial Team](#) / Updated on Jan 6, 2025[Table of contents](#)[BLOG](#)

Given that hardware resources like CPU and memory sizes are constrained for embedded systems, it is crucial to use these resources wisely and ethically.

Embedded C typically has the appropriate abstractions to communicate with the hardware resources in order to accomplish this.

Whether you're a college student trying to find an embedded systems internship, a recent graduate looking for an embedded software job, or a full-time embedded systems engineer trying to change positions or companies, we can help. To get where you desire, you'll always have to go through one or more technical interviews. So, this article has a compiled list of embedded c interview questions that helps beginners, intermediate and experienced candidates.

If you are familiar with embedded concepts, many top companies offer positions such as embedded developer in C/C++, embedded developer in software development & architecture, embedded developer in C/C++, embedded C programmer, embedded firmware developer in C/C++, senior engineer/tech lead in C/C++, among many others.

## **Here is the list of top 10 embedded c interview questions**

- [What is an Embedded System?](#)
- [How are Embedded Systems developed?](#)
- [Is the Embedded System computer-based?](#)
- [How Many Bits That Embedded Software Support?](#)
- [Which Operating System Is Used In Embedded Systems?](#)
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- [Explain 8051 FEATURES.](#)
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- [Define HEXADECIMAL](#)

## What is an Embedded System?

It is an application that contains at least one programmable computer, which is typically in the form of a microprocessor, microcontroller or digital signal processor chip.

## What is Embedded C Programming? How is Embedded C different from C language?

Embedded C is a C language extension that is used to create applications for microcontrollers. The I/O Hardware Addressing, fixed-point arithmetic operations, accessing address spaces, etc. are enhancements in the Embedded C language from the standard C programming language. There are five layers of basic structures in an embedded C programme. As follows:

**Comment:** To make it easier for the user to grasp, this text has been converted into simple, readable code. Comments are often written in `/` or `/* */`.

**Pre-processor directives:** The Pre-Processor directives specify which files the compiler should search for missing symbols in.

**Global Declaration:** The section of the program's code where global variables are declared. **Local Declaration:** The section of code that defines local variables.

**Main Function:** Every C programme has a main function that controls the entire program's code. The execution component and the declaration part make up the bulk of it. Whereas the execution component specifies the overall structure of programme execution, the declaration part is where all variables are defined.

## Is the Embedded System computer-based?

The Embedded System is computer-based.

## **Tell Me Some Real-Time Applications Of Embedded Processors?**

Some real-time applications are:

- Passengers cars
- Dishwashers
- Mobile Phones
- Television
- Medical equipment, etc.

## **Tell Me About The Facts That You know About 8051 Architecture?**

- 

It was initially developed by Intel and implemented in more than 400 chips. These are produced by a diverse range of companies, including Philips, Infineon, Atmel and Dallas.

## **How are Embedded Systems developed?**

The low price and easy availability of the 8051 families make it an excellent platform for developing embedded systems.

## **How Many Bits That Embedded Software Support?**

It supports 8, 16 or 32-bit embedded processors.

## **Which Operating System Is Used In Embedded Systems?**

The operating system used in an embedded system is a "real-time operating

system". The 256 bytes of memory in the 8051 is insufficient to support any version of WINDOWS, LINUX, or Similar desktop operating systems.

### **Mention The Embedded System In Mobile Phone?**

It includes both the customer handset and the Base station.

### **Tell Me The Embedded System In Automotive Applications?**

- Braking system
- Steer-by-wire system
- Traffic control
- Cruise control applications.
- Airbag release system
- Engine management units.

### **Tell Me The Domestic Appliances Which Include Embedded System?**

- Dishwashers
- Garage door controllers
- Televisions
- Washing machines
- Microwave ovens
- Video recorders and
- Security systems Etc.

### **Mention The Embedded System In Aerospace Applications?**

- Flight control systems
- Autopilot
- A passenger in-flight embedded system
- Engine controllers

### **Tell Me The Embedded System Which Includes Medical Equipment?**

- Anaesthesia monitoring systems
- ECG monitors
- Drug delivery systems and
- MRI Scanners

### **Mention the Embedded Systems Which Includes Defense System?**

- Radar systems
- Fighter aircraft flight control system
- Radio systems
- Missile guidance systems.

### **List out The Discrete Components.**

- Transistors
- Diodes
- Resistors
- Capacitor

### **Explain The Circuit below**

The Above Circuit explains about 'cupboard light application'. The Processor used in the above circuit is AtmelAT89C2051.It is intended for use in a cupboard and will be battery-powered. When the light is switched on, especially while pressing the switch, it will operate for 20 seconds. If the USER does not press the switch again (to turn off the light), The power will be removed automatically. It is a simple circuit and produced using a microcontroller.

### **Define Extended 8051 Device.**

Extended 8051s have additional on-chip facilities and additional port pins. In the case of Infineon, the other facilities include support for the 'Controller Area Network' (CAN) bus.CAN bus is widely used in the automotive sector and industrial environments.

### **How many Embedded Processors are Needed To Manufacture a Modern Passenger Car?**

Around 50 Processors are on board.

### **Tell Me The Expansion Of FPGA.**

FPGAs: field-programmable gate arrays.

### **What Is Machine Code?**

Computers only accept instructions in "machine code" or "object code". It is the language of the computer RATHER than the Programmer. The interpretation of the code by the programmer is complex and error-prone. Whether in assembly, C, C++, Java, or Ada, all software must ultimately be translated into machine code to be executed by the computer.

## **Explain 8051 FEATURES.**

Embedded processors like 8051 have limited processor power and minimal power available. The language used must be efficient. It has a longer lifespan.

## **Embedded system features on c.**

It is very efficient, popular and well understood. Even desktop developers who have used only Java or C++ can soon understand c syntax. Good and well-proven compilers are available for every embedded Processor.

## **Write the program for the super loop demonstration.**

```
Void main( void)
{
    //prepare run function x
    X_Init();
    While(1)  //  'for ever' (super loop)
    {
        X(); // Run function x()
    }
}
```

## **Describe the link between oscillator frequency and machine-cycle period.**



As a general rule, the speed at which your application runs is directly determined by the oscillator frequency. In most cases, If you double the oscillator frequency, the application will run twice as fast.

## **Expand MIPS.**

MIPS: Million instructions per second.

## **What are the range of maximum oscillator frequency and the peak performance in 8051?**

The 8051 had a maximum oscillator frequency of 12 MHz, and peak performance is 1 MIP.

## **How to improve the 8051 performance?**

The simple way to improve the performance of the 8051 microcontrollers is to increase the clock frequency. The 8051 devices allow the use of clock speeds well beyond the 12MHz limit of the original devices. The best way to improve the performance is to make internal changes to the microcontroller so that fewer oscillator cycles are required to execute each machine's instruction.

## **What are the types of memory in an Embedded System on C?**

- DRAM(Dynamic RAM)
- SRAM(Static RAM)
- Mask Read-only Memory (ROM)
- PROM(Programmable Read-Only Memory)
- UV EPROM(UV Erasable Programmable Read-Only Memory)

- EEPROM (Electrically – Erasable PROM)

## Embedded C Interview Questions

### Define DRAM.

It is a read-write memory technology which uses a small capacitor to store information. The capacitor will discharge rapidly and must be frequently refreshed to maintain the required information. There is a chance that the information is lost when power is removed from the chip.

### Define SRAM.

It is a read-write memory technology and uses a form of electronic flip flops to store the information. No refreshing is required, but the circuit is more complex. The access time may be one-third those of DRAM.

### Define Mask read-only memory.

It is also known as factory-programmed ROM, and mask programming is not cheap. ACCESS TIME of mask read-only memory is 1.5 times slower than the DRAM.

### Define prom.

It is a form of write-once, read-many (WORM) or "one-time programmable" (OTP) memory.

### Define UV EPROM.

Like PROM, UV EPROMs are programmed electrically. Unlike PROMs, they have a Quartz Window that allows the memory to be erased by exposing the device's internals to UV light. The quartz window will be covered with a UV-opaque label. This EPROM can withstand thousands of Programs/ erase cycles. It is more flexible than PROMs and can be used in prototyping.

**Define EEPROM.**

It is a more user-friendly form of ROM that can be both programmed and erased-friendly. It can be usually reprogrammed through byte by byte basis. It is used to store passwords and other persistent user data.

**Define FLASH ROM.**

It is a more user-friendly form of ROM that can be both programmed and erased easily. EEPROM and FLASH ROM are both similar to each other. It generally required a blocked-sized erase operation before programming.

**Define HEXADECIMAL.**

It is a base- 16 numbering scheme which provides a compact way of representing large binary numbers. It is widely used in embedded systems. The prefix '0X' is used in C( and elsewhere) to indicate that a number is in 'hex' notation.

**Name the memory regions in 8051 devices.**

There are two types of distinct memory regions in the 8051 devices. They are:

- The data area
- The code area.

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

C is a high-level programming language and the extension of c language is called embedded C. This programming language is independent of hardware. However, the embedded C programming language is actually hardware-dependent.

**Why is C used in embedded?**

The embedded system performs better because to C's improved machine instructions for the input. Since most high-level languages rely on libraries, they take up more memory, which is difficult for embedded systems to accommodate.

**What is embedded C?**

The C Standards Committee created Embedded C as a set of language extensions for the C programming language to solve issues of commonality between C extensions for various embedded devices.

**What are data types in embedded C?**

The three different integer data types that embedded C provides are int, short, and long. Integer values on 8-bit architectures are normally 16 bits in size by default, although Embedded C enables switching between 8 and 16 bits to save memory.

**Which software is used for embedded C?**

Embedded Software Development Tools List

PyCharm

WebStorm

Qt Creator

MPLAB X

Visual Studio

Eclipse

NetBeans

MATLAB

## How do I start embedded C?

4 Steps to Getting Started with Embedded Programming

Learn C.

Learn Basic Electronics.

Choose a Microcontroller and Toolchain.

Pick Components & Dig into Their Datasheets.

## Is Arduino embedded C?

The AVR microcontrollers used inside Arduino boards are programmed using a subset of C, just like other microcontrollers. These subsets are referred to as "Embedded C" in general since they are used for programming embedded controllers.

## Can we use printf in embedded C?

Although the majority of platforms have their own APIs that can send data over a UART bus, none of them has the strength and ubiquity of the `printf()` function. Unfortunately, merely adding the `stdio` library is frequently inadequate to use this function in an embedded C application.

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