

# C/C++ interview questions

## Hardware architecture interview questions

1. Are you familiar with the term MESI?
2. Are you familiar with the term snooping?
3. Describe a finite state machine that will detect three consecutive coin tosses (of one coin) that results in heads.
4. In what cases do you need to double clock a signal before presenting it to a synchronous state machine?
5. You have a driver that drives a long signal & connects to an input device. At the input device there is either overshoot, undershoot or signal threshold violations, what can be done to correct this problem?
6. For a single computer processor computer system, what is the purpose of a processor cache and describe its operation?
7. Explain the operation considering a two processor computer system with a cache for each processor.
8. What are the main issues associated with multiprocessor caches and how might you solve it?
9. Explain the difference between write through and write back cache.
10. What are the total number of lines written in C/C++? What is the most complicated/valuable program written in C/C++?
11. What compiler was used?
12. Have you studied busses? What types?
13. Have you studied pipelining? List the 5 stages of a 5 stage pipeline. Assuming 1 clock per stage, what is the latency of an instruction in a 5 stage machine? What is the throughput of this machine ?
14. How many bit combinations are there in a byte?
15. What is the difference between = and == in C?
16. Are you familiar with VHDL and/or Verilog?

## Tricky C questions

1. How do you write a program which produces its own source code as its output?
2. How can I find the day of the week given the date?
3. Why doesn't C have nested functions?
4. What is the most efficient way to count the number of bits which are set in a value?
5. How can I convert integers to binary or hexadecimal?
6. How can I call a function, given its name as a string?
7. How do I access command-line arguments?
8. How can I return multiple values from a function?
9. How can I invoke another program from within a C program?
10. How can I access memory located at a certain address?
11. How can I allocate arrays or structures bigger than 64K?
12. How can I find out how much memory is available?
13. How can I read a directory in a C program?
14. How can I increase the allowable number of simultaneously open files?
15. What's wrong with the call `fopen("c:\newdir\file.dat", "r")`?

## C++ developer interview

1. Will the following program execute?  

```
void main()
{
void *vptr = (void *) malloc(sizeof(void));
vptr++;
}

```
2. How about this one?  

```
void main()
{
char *cptr = 0?2000;
long *lptr = 0?2000;
cptr++;
lptr++;
printf(" %x %x", cptr, lptr);
}

```

Will it execute or not?
3. When the processor wakes up after power on, it goes to a particular memory location. What is that memory location called?
4. What is the difference between Mutex and Binary semaphore?
5. Write a program to set 2nd bit in a 32 bit register with memory location 0×2000?

## C questions for a hardware engineer

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7. Are you familiar with VHDL and/or Verilog?

## C++ interview questions

This set of C++ interview questions was sent to TechInterviews from Australia:

1. What is the difference between an ARRAY and a LIST?
2. What is faster : access the element in an ARRAY or in a LIST?
3. Define a constructor - what it is and how it might be called (2 methods).
4. Describe PRIVATE, PROTECTED and PUBLIC – the differences and give examples.
5. What is a COPY CONSTRUCTOR and when is it called (this is a frequent question !)?
6. Explain term POLIMORPHISM and give an example using eg. SHAPE object: If I have a base class SHAPE, how would I define DRAW methods for two objects CIRCLE and SQUARE.
7. What is the word you will use when defining a function in base class to allow this function to be a polimorphic function?
8. What are 2 ways of exporting a function from a DLL?
9. You have two pairs: new() and delete() and another pair : alloc() and free(). Explain differences between eg. new() and malloc()
10. What is a callback function. Explain in C and C++ and WIN API environment.
11. (From WINDOWS API area): what is LPARAM and WPARAM?

## C++ notes for discussion

This is not really a set of interview questions, a reader sent TechInterviews.com what looks like a copy of his notes from C++ class that describes various tricks and code for C++.

1. **What is the output of printf(“%d”)?**
  1. %d helps to read integer data type of a given variable
  2. when we write (“%d”, X) compiler will print the value of x assumed in the main
  3. but nothing after (“%d”) so the output will be garbage
  4. printf is an overload function doesn't check consistency of the arg list – segmentation fault
2. **What will happen if I say *delete this*?** - destructor executed, but memory will not be freed (other than work done by destructor). If we have class Test and method Destroy { delete this } the destructor for Test will execute, if we have Test \*var = new Test()
  1. pointer var will still be valid
  2. object created by new exists until explicitly destroyed by delete
  3. space it occupied can be reused by new
  4. delete may only be applied to a pointer by new or zero, applying delete to zero = no FX
  5. delete = delete objects
  6. delete[] – delete array
  7. delete operator destroys the object created with new by deallocating the memory assoc. with the object
  8. if a destructor has been defined for a class delete invokes that destructor

## Some general quickies

1. How did you first get interested in Computer Science?
2. What do you like to do best related to computers now (programming, administration, testing, manage projects, etc)? What is it about that area that you specifically enjoy?
3. What is your strongest programming language (Java, ASP, C, C++, VB, HTML, C#, etc.)?
4. When is the last time you coded in C/C++? What is the most lines of original C/C++ code you have personally written in one project? How confident are you in your ability to write C or C++ without a reference?

## Embedded firmware interview questions

- **Write function in C that gets array of chars, and search for the longest sequence of repeatedly 1 bits. It returns the the first bit place in the sequence and the number of 1 bits in the sequence.**  
- (a) loop of  $2^0, 2^1, \dots, 2^7$  is done with  $1 \leq j$  when  $0 \leq j \leq 7$ . (b) Take care of remembering the first place of the bit sequence you are counting.
- **You have 16bit register that increment itself and loops about every second. When the register reach 0xffff it will issue an interrupt and will run the function update\_time(). There is a function unsigned long get\_time() that returns the time. You need to implement the two functions.**  
- (a) You need to count every interrupt in order to save the number of seconds. (b) The counter will be the 16bit MSB, and the actual register will be 16bit LSB. (c) If the register will be at  $\sim 0xffff$ , you will return MSB that is not correct, because you will read the counter, then interrupt will occur and increment by one. Now you have counter that is not correct. (d) You need to check for the (c) problem, and if you catch the problem, you need to read once again the register and the

counter before you return them. You depend on the fact that you have about another second until the register will loop.

## C and C++ questions for the interview

C++

1. What is the output of `printf("%d")`?
2. What will happen if I say delete this?
3. Difference between “C structure” and “C++ structure”.
4. Difference between a “assignment operator” and a “copy constructor”?
5. What is the difference between “overloading” and “overriding”?
6. Explain the need for “Virtual Destructor”.

## Microsoft college recruitment questions

Candidate Raja Shekhar faced these questions from Microsoft recruiter, who apparently was hiring straight out of college.

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3. What is your strongest programming language (Java, ASP, C, C++, VB, HTML, C#, etc.)?
4. When is the last time you coded in C/C++? What is the most lines of original C/C++ code you have personally written in one project? How confident are you in your ability to write C or C++ without a reference?

## Windows programming interview questions

1. **What are kernel objects?** - - Several types of kernel objects, such as access token objects, event objects, file objects, file-mapping objects, I/O completion port objects, job objects, mailslot objects, mutex objects, pipe objects, process objects, semaphore objects, thread objects, and waitable timer objects.
2. **What is a kernel object?** - Each kernel object is simply a memory block allocated by the kernel and is accessible only by the kernel. This memory block is a data structure whose members maintain information about the object. Some members (security descriptor, usage count, and so on) are the same across all object types, but most are specific to a particular object type. For example, a process object has a process ID, a base priority, and an exit code, whereas a file object has a byte offset, a sharing mode, and an open mode.