# Interview Questions by Smeet Raj

vayavya labs, ignitarium, qualcomm, ibm, capegemini, xylem

## Questions

1. **Write a program to access a specific element in a 1D array and a 2D array.**
2. **Count the number of bits set in a variable using bitwise operators.**
3. **Write a program to find the first non-repeating character in a string.**
4. **Implement a function to detect and remove a loop in a linked list.**
5. **Describe call by value and call by reference with illustrative programs.**
6. **Explain what happens internally when a program calls a function.**
7. **Create a program to perform bitwise multiplication of two integers.**
8. **Develop a program to toggle all the bits of a given number except the leftmost set bit.**
9. **What happens if you include `#include <stdio.h>` or any header file multiple times in a program? Explain with the generated preprocessor (.i) file.**
10. **Explain the compilation flow of a C program and discuss the generation of intermediate files with practical examples.**
11. **Determine if a given number is a power of two without using arithmetic operators.**
12. **Implement a function to check if a linked list is a palindrome.**
13. **Write a C program to check if a given string is a palindrome.**
14. **Write a C program to print each character of a word on a separate line using an array.**
15. **Create a C program to check if a number is an Armstrong number.**

16. **Implement the internal workings of the modulus (%) operator in C, using the formula provided.**
17. **Write a statement to check if a given number falls within a specified range.**
18. **Explain the concepts of dynamic loading and static loading.**
19. **Write a function to find the intersection point of two linked lists.**
20. **Explain what `NULL` is and its internal representation.**
21. **Write a program to reverse the bits of a given 32-bit unsigned integer.**
22. **To whom does the `main` function return `0`?**
23. **Write a program where every function is placed in different memory sections (data, bss, rodata, heap, etc.).**
24. **When will the condition `if(num >= 5 || num <= 100)` fail? Write code to test this.**
25. **Write a program to find the middle element of a linked list.**
26. **Write a program to rotate a linked list by a given number of nodes.**
27. **Develop a program to reverse a linked list.**
28. **How can you set, toggle, clear, and check a particular bit using bitwise operators? Write a code snippet for each operation.**
29. **What is structure padding? Discuss its benefits and disadvantages.**
30. **Create a program to check if a number is odd or even without using the modulus (%) operator.**
31. **Define a callback function and provide an example in C.**
32. **Write a function to merge two sorted linked lists into one sorted linked list without using extra space.**
33. **Write a C program to check if your machine is Little Endian or Big Endian.**
34. **Create a function to convert a binary number to its Gray code equivalent using bitwise operators.**
35. **Develop a program to count the number of trailing zeros in the binary representation of a number using bitwise operations.**
36. **Describe the use of function pointers with an example program.**

37. **Write a recursive program to reverse both positive and negative numbers.**

38. **Define linear and non-linear data structures and provide examples of each.**

39. **List and explain the operations that can be performed on a stack.**

40. **Explain a searching or sorting algorithm in detail, with a code example.**

41. **Implement a linked list using both head and tail pointers.**

42. **Implement a stack using a linked list and state how many pointers are needed.**

43. **Enumerate the properties of a stack data structure.**

44. **What is the size of `void` in C?**

45. **What is a re-entrant function?**