Bit Manipulation Interview Questions and Practice Problems

Coding Freak

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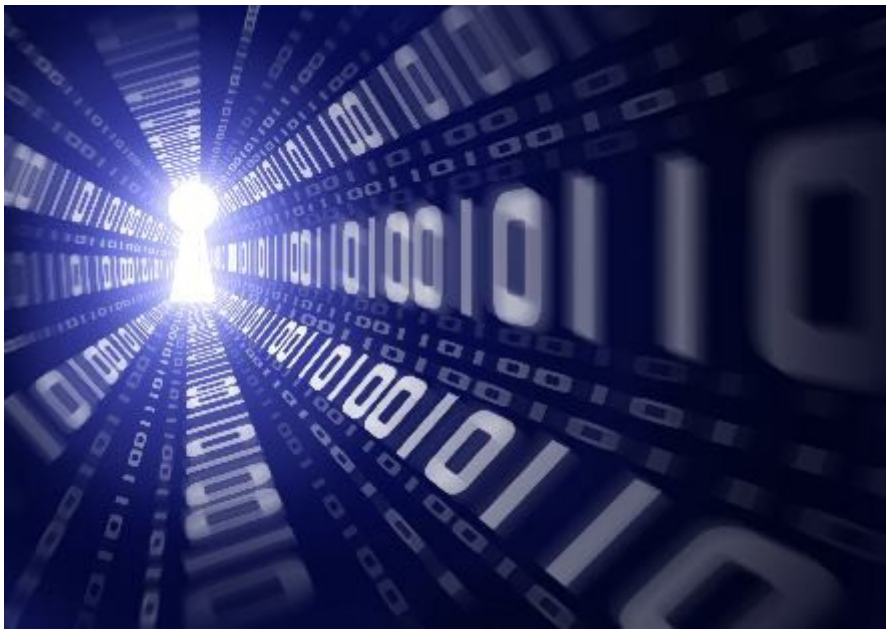

Bit manipulation is the act of algorithmically manipulating bits. Computer programming tasks that require bit manipulation include low-level device control, error detection and correction algorithms, data compression, encryption algorithms, and optimization. For most other tasks, modern programming languages allow the programmer to work directly with abstractions instead of bits that represent those abstractions. Source code that does bit manipulation makes use of the bitwise operations: AND, OR, XOR, NOT, and bit shifts. Bit manipulation, in some cases, can obviate or reduce the need to loop over a data structure and can give many-fold speed ups, as bit manipulations are processed in parallel, but the code can become more difficult to write and maintain.

In this post, we will discuss few such interesting bit manipulation hacks and interview questions -

1. Bit Hacks — Part 1 (Basic)
2. Bit Hacks — Part 2 (Playing with k'th bit)
3. Bit Hacks — Part 3 (Playing with rightmost set bit of a number)
4. Bit Hacks — Part 4 (Playing with letters of English alphabet)
5. Bit Hacks — Part 5 (Find absolute value of an integer without branching)
6. Bit Hacks — Part 6 (Random Problems)
7. Brian Kernighan's Algorithm to count set bits in an integer
8. Compute parity of a number using lookup table
9. Count set bits using lookup table
10. Find the minimum or maximum of two integers without using branching

14. Swap individual bits at given position in an integer
15. Check if given number is power of 4 or not
16. Reverse Bits of a given Integer
17. Find odd occurring element in an array in single traversal
18. Find two odd occurring element in an array without using any extra space
19. Swap two bits at given position in an integer
20. Add binary representation of two integers
21. Swap Adjacent Bits of a Number
22. Print all distinct Subsets of a given Set
23. Perform Division of two numbers without using division operator (/)
24. Check if adjacent bits are set in binary representation of a given number
25. Conditionally negate a value without branching
26. Find two duplicate elements in an limited range array (using XOR)
27. Find missing number and duplicate elements in an array
28. Check if given number is power of 8 or not
29. Circular shift on binary representation of an integer by k positions
30. Solve given set of problems without using multiplication or division operators
31. Reverse Bits of an integer using lookup table
32. Generate binary numbers between 1 to N
33. Efficiently implement power function | Recursive and Iterative
34. Find square of a number without using multiplication and division operator
35. Generate power set of a given set
36. Find all odd occurring elements in an array having limited range of elements

Thank you.

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