**Bitwise Programming**

1. **Bitwise AND:**

Tests two binary number and returns bit value ‘**1’** if both bits for position have one, returns **‘0’** if both number did not have one.

01001011

& 00010101

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00000001

1. **Bitwise OR:**

Tests two binary number and returns bit value ‘**1’** if either bits for position have one, returns **‘0’** if both number have zero.

01001011

| 00010101

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01011111

1. **Bitwise Exclusive-OR:**

Tests two binary number and returns bit value ‘**1’** if both bits for position are different, returns **‘0’** if both bits are same.

01001011

^ 00010101

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01011110

1. **Bitwise Left Shift:**

The bitwise left shift moves all bits in the number to the left and fills vacated bit position with 0.

01001011

<< 2

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00101100

1. **Bitwise Right Shift:**

The bitwise right shift moves all bits in the number to the right.

01001011

>> 2

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??010010

**Note:** In case of **unsigned bits, ‘?’** will be replaced by 0 i.e. right shifted bits will be filled with 0.

But in case of **signed bits,** right shift will fill the vacated bit position with the sign bit or 0, which one is implementation defined.

So best option is to never right shift signed values.

1. **Bitwise Complement:**

The bitwise complement inverts the bits in a single binary number.

01001011

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10110100

1. WAP (write a program) to check if K-th bit is set or not?
2. WAP to set K-th bit?
3. WAP to clear K-th bit?
4. WAP to toggle K-th bit.
5. WAP to toggle rightmost one bit.
6. WAP to isolate rightmost one bit.
7. WAP to isolate rightmost zero bit.
8. WAP to check if number is power of 2 or not.
9. WAP to multiply number by power of 2.
10. WAP to divide number by power of 2.
11. WAP to find modulo of a given number.
12. WAP to reverse the binary number.
13. WAP a program to count number of set bits in a given number.
14. WAP a program to set m-th and n-th bit of given number.
15. WAP a program to clear m-th and n-th bit of given number.