Bit Manipulation

Additional

- XOR
    - for flipping selective bits, _____ is chosen.
    - for flipping a bit, XOR it with 1, it will get reversed.
    - N ^ 1 =
    - N ^ 0 =
- NOT
    - The bitwise complement operator, _____, flips every bit in a number.

Usages

- _____ = N*2
- _____ = N*pow(2,2)
- _____ = N*(pow(2,k))
- _____ = floor(N/2)
- _____ = floor(N/2^2)
- _____ = floor(N/2^k)
- _____ = last bit in N
- _____ = last 2 bits in N
- _____ = last 3 bits in N
- _____ = last k bits in N
- _____ = -N
- _____ = least significant byte of integer or the last 8 bits of integer.
    - An Integer normally has 4 bytes(32 bits)
    - F in hex is 1111 in binary, so FF(or 0xFF) is 11111111 in binary
    - Doing _____ removes the first 3 bytes and only keeps the last byte(8 bits) of integer
    - Eg 1783 in binary is 11011110111
    - 1783 & 0xFF only keeps the last 8 bits of 11011110111, and is, 11110111, which is 247

Example Interview Questions

Multiply a no by 2

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Divide a no by 2

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set the kth bit of N(counting from right) to 1.

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clear the kth bit of N(counting from right).

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toggle/flip the kth bit of N(counting from right).

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turn off the first set bit(1 bit) of a number N.

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get the count of 1s in a no.

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How to calculate the no of bits to convert from no A to no B.

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Check if N is a power of 2 or not.

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Check if N is a power of 4 or not.

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How to get the last 3 bits of an integer.

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Get the 5 highest bits of an integer(8 bit integer).

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check whether the kth bit in N is 1.

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swap two nos using bitwise operations.

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swap even and odd bits in a no(4 byte integer)

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Misc

- IP address
  - normally represented as A:B:C:D
  - has 4 bytes, each of A, B, C, D representing a byte(8 bits).
  - each of A, B, C, D is 1 byte or 8 bits, and can have values from 0 to 255
- Right most bit(assuming 16 bit integer)???
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- Left most bit(assuming 16 bit integer)???
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- Sign bit(assuming 16 bit integer)???
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