DSA SERIES

- Learn Coding

Topic to be Covered today

Bit Manipulation

LETS START TODAY'S LECTURE

3097. Shortest Subarray With OR at Least K II

```
class Solution {
public:
    int minimumSubarrayLength(vector<int>& nums, int k) {
        int result = INT_MAX;
        int n = nums.size();

        int i = 0, j = 0, val = 0;
        vector<int> counter(32, 0);

        while (j < n) {
            // Adding
            for (int b = 0; b < 32; b++) {
                if (nums[j] & (1 << b)) {
                    counter[b]++;
                    val |= 1 << b;
                }
            }

            while (val >= k && i <= j) {
                result = min(result, j - i + 1);
                // Removal

                for (int b = 0; b < 32; b++) {
                    if (nums[i] & (1 << b)) {
                        counter[b]--;

                        if (counter[b] == 0) {
                            val &= ~(1 << b);
                        }
                    }
                }
                i++;
            }
            j++;
        }

        return result == INT_MAX ? -1 : result;
    }
};
```

3133. Minimum Array End

```
class Solution {
public:
    long long minEnd(int n, int x) {
        long long num =x;
        for(int i =1;i<n;i++){
            num = (num +1) | x;
        }

        return num;
    }
};
```

2680. Maximum OR

```
class Solution {
public:
    long long maximumOr(vector<int>& nums, int k) {

        int n =nums.size();
        vector<long long> prefix(n+1,0),suffix(n+1,0);

        // Build prefix
        for(int i =0;i<n;i++){
            prefix[i+1]= prefix[i] | nums[i];
        }

        // Suffix

        for(int i =n-1;i>0;i--){
            suffix[i]= suffix[i+1] | nums[i];
        }

        long long result =0;
        for(int i =0;i<n;i++){
            long long shift = (long long) nums[i]<<k;

            long long temp = prefix[i] | shift | suffix[i+1];

            result = max (result,temp);
        }
       return result;
    }
};
```

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THANK YOU