Fenwick Tree + Sparse Table

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5 ⭐ on CodeChef

Fenwick Tree / BIT

$bit[i] = sum(a[f(i)+1 ; i])$

$f(i) =$ i with last set bit cleared

$f(5) = f(101) = 100 = 4$

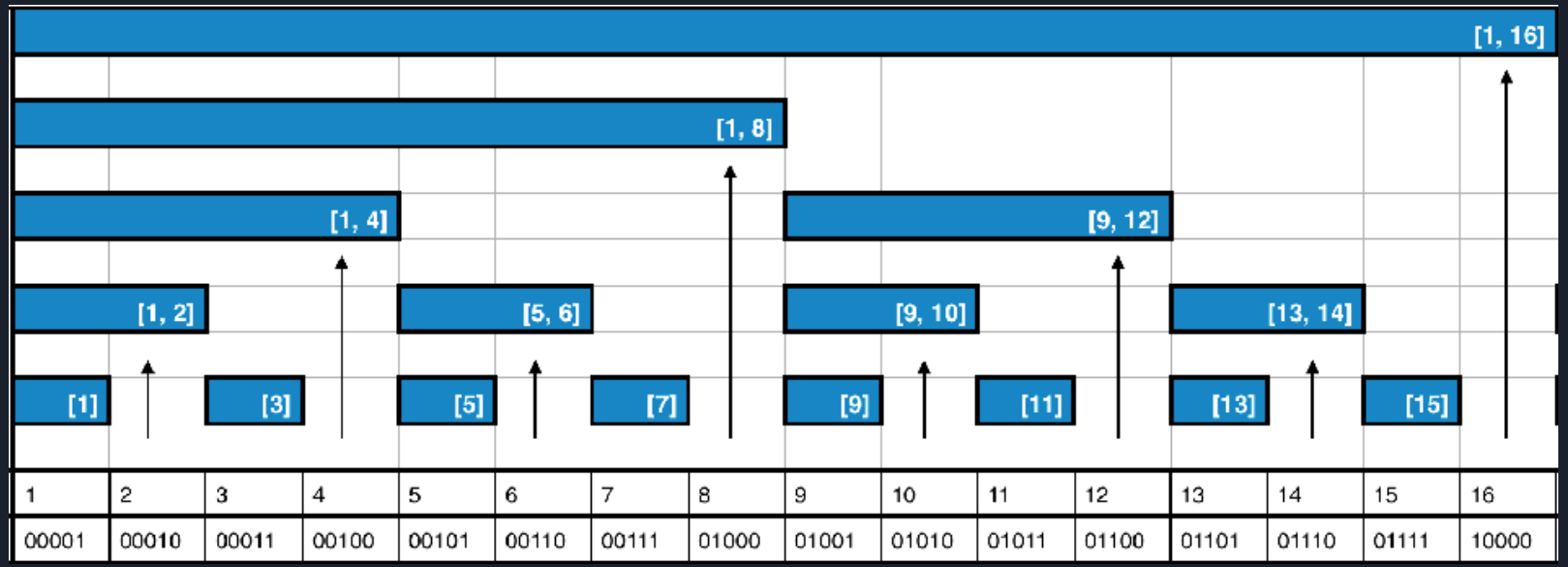
$bit[5] = sum(a[5;5]) = a[5]$

$bit[8] = sum(a[1;8]) = a[1]+a[2] \ldots a[8]$

$f(i) = i - (i \& -i)$

Fenwick Tree / BIT

Query : $O(\log n)$ Upd : $O(\log n)$



Sparse Table

$st[i][j] = \min(a[i ; i+2^j])$

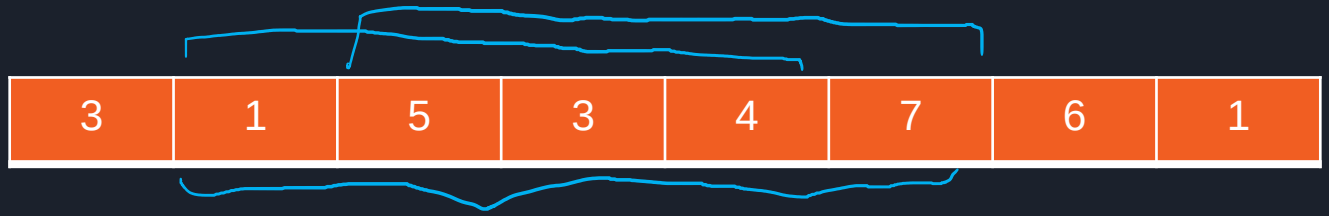
$st[i][0] = a[i]$

$st[i][j] = \min(st[i][j-1], st[i+2^{j-1}][j-1])$

Query = O(1) ✓

Idempotent func: $f(a, a) = a$

Sparse Table



3	1	5	3	4	7	6	1
1	1	3	3	4	6	1	
1	1	3	3	1			
1							