```cpp
#include "../bits/stdc++.h"
// http://hos.ac/slides/20140319_bit.pdf
// add(pos, w) := v[pos] += w
// sum(l, r) := v[l] + ... + v[r - 1]
// verified: http://judge.u-aizu.ac.jp/onlinejudge/review.jsp?rid=3380704#1
template <typename T>
class FenwickTree
{
    int n;
    std::vector<T> bit;

  public:
    FenwickTree(int _n) : n(_n), bit(_n, 0) {}

    void add(int pos, const T &w)
    {
        assert(0 <= pos && pos < n);
        for (int i = pos; i < n; i |= i + 1)
            bit[i] += w;
    }
    // v[0] + ... + v[pos-1]
    T sum(int pos)
    {
        assert(0 <= pos && pos <= n);
        T res = 0;
        for (int i = pos - 1; i >= 0; i = (i & (i + 1)) - 1)
        {
            res += bit[i];
        }
        return res;
    }
    T sum(int l, int r)
    {
        assert(0 <= l && l <= r && r <= n);
        return sum(r) + (-sum(l));
    }
};

```