

Program3: sum of n number of elements in the range of L and R  
 where  $0 \leq L \leq R \leq n-1$

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package mounika3;
public class RangeQueries
{
    static int k = 15;
    static int N = 100000;
    static long table[][] = new long[N][k + 1];
    static void buildSparseTable(int arr[], int n)
    {
        for (int i = 0; i < n; i++)
            table[i][0] = arr[i];
        for (int j = 1; j <= k; j++)
            for (int i = 0; i <= n - (1 << j); i++)
                table[i][j] = table[i][j - 1] + table[i + (1 << (j - 1))][j -
1];
    }
    static long query(int L, int R)
    {
        long answer = 0;
        for (int j = k; j >= 0; j--)
        {
            if (L + (1 << j) - 1 <= R)
            {
                answer = answer + table[L][j];
                L += 1 << j;
            }
        }
        return answer;
    }
    public static void main(String args[])
    {
        int arr[] = { 3, 7, 2, 5, 8, 4 };
        int n = arr.length;
        buildSparseTable(arr, n);
        System.out.println(query(0, 5));
        System.out.println(query(3, 5));
        System.out.println(query(2, 4));
    }
}

```

