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#include <iostream>
#include <vector>

template <typename T>
int find(const std::vector<T> &data, const T key, int k, int lb, int ub) {
    if (ub - lb < k) {
        for (int i = lb; i < ub && data[i] <= key; ++i) {
            if (data[i] == key)
                return i;
        }
        return data.size(); // 用 -1 表示 「找不到」
    }

    int periods[k - 1];
    for (int i = 1; i < k; ++i)
        periods[i - 1] = (lb * i + ub * (k - i)) / k;

    // first part
    if (key < data[periods[0]])
        return find(data, key, k, lb, periods[0]);
    if (key == data[periods[0]])
        return periods[0];

    // middle part
    for (int i = 1; i < k - 1; ++i) {
        if (key < data[periods[i]])
            return find(data, key, k, periods[i - 1] + 1, periods[i]);
        if (key == data[periods[i]])
            return periods[i];
    }

    // last part
    return find(data, key, k, periods[k - 2] + 1, ub);
}

template <typename T> int find(const std::vector<T> &data, const T key, int k) {
    return find(data, key, k, 0, data.size());
}

int main() {
    std::vector<int> data = {1, 3, 5, 7, 9, 11, 13, 15, 17, 19};
    int key;
    int k;

    std::cout << "input key value: ";
    std::cin >> key;

    std::cout << "input k: ";
    std::cin >> k;

    int result = find(data, key, k);

    if (result == data.size())
        std::cout << "cannot find " << key << "\n";
    else
        std::cout << "find " << key << " in the index of " << result << "\n";
    return 0;
}

```