# 20221013 数据结构与算法 解题报告

## Query

将字符串转为数字编码，做Hash操作即可。

#include <bits/stdc++.h>  
#include "query.h"  
using namespace std;  
  
#define MOD 1000007  
#define LL long long  
  
int transInt(string str) {  
 int val = 0;  
 for (int i = 0; i < str.length(); i++) val = (val \* 131 + (str[i] - 'A' + 1)) % MOD;  
 return val;  
}  
  
void query(string A[], int n, string B[], int m) {  
 vector<string> hash(MOD, "");  
 for (int i = 0; i < n; i++) {  
 string val = A[i]; int pos = transInt(A[i]);  
 for (; hash[pos] != "" && hash[pos] != val; pos = (pos + 1) % MOD); hash[pos] = val;  
 }  
 for (int i = 0; i < m; i++) {  
 string val = B[i]; int pos = transInt(B[i]);  
 for (; hash[pos] != "" && hash[pos] != val; pos = (pos + 1) % MOD);  
 if (hash[pos] == val) cout << B[i] << endl;  
 }  
}

## 爸爸去哪儿之一

将字符串转为数字编码，做Hash操作时统计答案即可。

#include <bits/stdc++.h>  
using namespace std;  
  
#define LL long long  
  
int transInt(string str) {  
 int val = 0;  
 for (int i = 0; i < str.length(); i++) val += str[i] - 'a' + 1;  
 return val;  
}  
  
int main(int argc, char const \*argv[]) {  
 // freopen("init.in", "r", stdin);  
 int n, m; cin >> n >> m;  
 double ans = n;  
 vector<string> name(n); vector<string> hash(m, "");  
 for (auto &i : name) {  
 cin >> i;  
 int pos = transInt(i) % m;  
 for (; hash[pos] != "" && hash[pos] != i; pos = (pos + 1) % m) ans += 1;  
 hash[pos] = i;  
 }  
 for (int i = 0; i < m; i++) cout << i << ":" << (hash[i] == "" ? "NULL" : hash[i]) << endl;  
 printf("%.3lf\n", ans / n);  
 return 0;  
}

## 爸爸去哪儿之二

将字符串转为数字编码，做平方探测Hash操作时统计答案即可。

#include <bits/stdc++.h>  
using namespace std;  
  
#define LL long long  
  
int transInt(string str) {  
 int val = 0;  
 for (int i = 0; i < str.length(); i++) val += str[i] - 'a' + 1;  
 return val;  
}  
  
int main(int argc, char const \*argv[]) {  
// freopen("init.in", "r", stdin);  
 int n, m;  
 cin >> n >> m;  
 double ans = n;  
 vector<string> name(n);  
 vector<string> hash(m, "");  
 for (auto &str : name) {  
 cin >> str;  
 int pos = transInt(str) % m;  
 int sqr;  
 for (sqr = 0; hash[(pos + sqr \* sqr) % m] != "" &&  
 hash[(pos + sqr \* sqr) % m] != str;  
 sqr++)  
 ans += 1;  
 hash[(pos + sqr \* sqr) % m] = str;  
 }  
 for (int i = 0; i < m; i++)  
 cout << i << ":" << (hash[i] == "" ? "NULL" : hash[i]) << endl;  
 printf("%.3lf\n", ans / n);  
 return 0;  
}