

字符串

人员

赵广宇、李政毅、张皓宁、韩鸿钜、许岩、方冠霖、金一航、陈瀚霄、黄诗琦、付丙霖、卢炫佑 到课

上周作业检查

上周作业链接: <https://www.luogu.com.cn/contest/236055>

2025-0315 五队上课 (综合练习)

报名

编辑比赛

题目数5 | 报名人数22

比赛说明 | 题目列表 | 排行榜

名次	参赛者	总分	A	B	C	D	E
#1	隋天翼	500 (16.79h)	100 (18.78min)	200 (44.45min)	100 (1.95h)	100 (13.79h)	
#2	黄诗琦	500 (1.33d)	100 (7.35h)	200 (7.37h)	100 (8.60h)	100 (8.61h)	
#3	陈瀚霄	500 (1.36d)	100 (7.35h)	200 (7.69h)	100 (8.62h)	100 (8.90h)	
#4	曹承贤	500 (1.36d)	100 (7.30h)	200 (7.63h)	100 (8.72h)	100 (9.07h)	
#5	张皓宁	500 (1.37d)	100 (7.35h)	200 (7.93h)	100 (8.62h)	100 (9.01h)	
#6	牛晓晨	500 (2.62d)	100 (15.83min)	200 (50.35min)	100 (2.00h)	100 (2.49d)	
#7	范家郡	500 (6.80d)	100 (18.42min)	200 (1.75h)	100 (2.84h)	100 (6.60d)	
#8	刘新睿	500 (7.96d)	100 (23.10min)	200 (55.85min)	100 (1.35d)	100 (6.56d)	
#9	卢炫佑	500 (12.03d)	100 (20.47min)	200 (1.02h)	100 (5.48d)	100 (6.49d)	
#10	金一航	500 (13.81d)	100 (7.31h)	200 (7.86h)	100 (6.58d)	100 (6.60d)	
#11	韩鸿钜	500 (13.84d)	100 (7.38h)	200 (7.79h)	100 (6.56d)	100 (6.64d)	
#12	方冠霖	400 (23.82h)	100 (7.31h)	200 (7.82h)	100 (8.69h)		
#13	许岩	400 (23.97h)	100 (7.32h)	200 (7.79h)	100 (8.87h)		
#14	赵广宇	400 (1.83d)	100 (7.34h)	200 (7.87h)	100 (1.20d)		
#15	王彦臻	400 (3.07d)	100 (5.15h)	200 (7.87h)	100 (2.52d)		
#16	韩承煊	300 (1.14h)	100 (22.65min)	200 (45.98min)			
#17	李政毅	300 (15.33h)	100 (7.38h)	200 (7.95h)			
#18	刘智予	100 (7.24h)	100 (7.24h)				

数据导出 (CSV 格式)

作业

<https://www.luogu.com.cn/contest/237555> (课上讲了 A ~ C 这些题, 课后作业是 D 题)

课堂表现

今天课堂上讲了 hash 和 trie 两个知识点，这两个知识点都不是很难，但是同学们课下要好好复习

如果不好好复习，下周上课就忘干净了

课堂内容

P1330 封锁阳光大学

```
#include <bits/stdc++.h>

using namespace std;

const int maxn = 1e4 + 5;
vector<int> vec[maxn];
int f[maxn];
int cnt0, cnt1;

bool dfs(int u, int col) {
    if (f[u] != -1) return f[u]==col;

    f[u] = col;
    if (col == 0) cnt0++;
    else cnt1++;

    for (int i : vec[u]) {
        if (!dfs(i, 1-col)) return false;
    }
    return true;
}

int main()
{
    memset(f, -1, sizeof(f));
    int n, m; cin >> n >> m;
    while (m -- ) {
        int u, v; cin >> u >> v;
        vec[u].push_back(v), vec[v].push_back(u);
    }

    int res = 0;
    for (int i = 1; i <= n; ++i) {
        if (f[i] == -1) {
            cnt0 = 0, cnt1 = 0;
            if (!dfs(i, 0)) {
                cout << "Impossible" << endl;
                return 0;
            } else res += min(cnt0, cnt1);
        }
    }
    cout << res << endl;
}
```

```
    return 0;
}
```

AT_abc382_f [ABC382F] Falling Bars

```
#include <bits/stdc++.h>

using namespace std;

const int maxn = 2e5 + 5;
struct node {
    int l, r;
    int maxx;
    bool flag;
} tr[maxn*4];

void pushup(int u) { tr[u].maxx = max(tr[u*2].maxx, tr[u*2+1].maxx); }

void pushdown(int u) {
    if (tr[u].flag) {
        tr[u*2].flag = true, tr[u*2].maxx = tr[u].maxx;
        tr[u*2+1].flag = true, tr[u*2+1].maxx = tr[u].maxx;
        tr[u].flag = false;
    }
}

void build(int u, int l, int r) {
    tr[u] = {l, r};
    if (l == r) return;
    int mid = (l + r) / 2;
    build(u*2, l, mid), build(u*2+1, mid+1, r);
}

void modify(int u, int l, int r, int k) {
    if (tr[u].l >= l && tr[u].r <= r) {
        tr[u].flag = true, tr[u].maxx = k; return;
    }

    pushdown(u);
    int mid = (tr[u].l + tr[u].r) / 2;
    if (l <= mid) modify(u*2, l, r, k);
    if (r > mid) modify(u*2+1, l, r, k);
    pushup(u);
}

int query(int u, int l, int r) {
    if (tr[u].l >= l && tr[u].r <= r) return tr[u].maxx;

    pushdown(u);
    int mid = (tr[u].l + tr[u].r) / 2, res = 0;
    if (l <= mid) res = query(u*2, l, r);
```

```

    if (r > mid) res = max(res, query(u*2+1, l, r));
    return res;
}

struct Node {
    int h, l, r, id;
} w[maxn];
bool cmp(Node p, Node q) { return p.h > q.h; }
int f[maxn];

int main()
{
    int n, m, q; cin >> n >> m >> q;
    build(1, 1, m);

    for (int i = 1; i <= q; ++i) {
        int h, l, len; cin >> h >> l >> len;
        int r = l+len-1;
        w[i] = {h, l, r, i};
    }
    sort(w+1, w+q+1, cmp);

    for (int i = 1; i <= q; ++i) {
        int l = w[i].l, r = w[i].r, id = w[i].id;
        int t = query(1, l, r);
        f[id] = n-t; modify(1, l, r, t+1);
    }

    for (int i = 1; i <= q; ++i) cout << f[i] << endl;
    return 0;
}

```

P8306 【模板】字典树

```

#include <bits/stdc++.h>

using namespace std;

const int N = 3e6 + 5, M = 62;
int tr[N][M], idx = 0;
int cnt[N];

int get_int(char x) {
    if (islower(x)) return x-'a';
    if (isupper(x)) return x-'A'+26;
    return x-'0'+52;
}

void tr_insert(string s) {
    int p = 0;
    for (char i : s) {

```

```

    int u = get_int(i);
    if (!tr[p][u]) tr[p][u] = ++idx;
    p = tr[p][u];
    cnt[p]++;
}
}

int tr_query(string s) {
    int p = 0;
    for (char i : s) {
        int u = get_int(i);
        if (!tr[p][u]) return 0;
        p = tr[p][u];
    }
    return cnt[p];
}

void solve() {
    int n, m; cin >> n >> m;
    while (n -- ) { string s; cin >> s; tr_insert(s); }
    while (m -- ) { string s; cin >> s; cout << tr_query(s) << endl; }

    for (int i = 0; i <= idx; ++i) {
        cnt[i] = 0;
        for (int j = 0; j < M; ++j) tr[i][j] = 0;
    }
    idx = 0;
}

int main()
{
    int T; cin >> T;
    while (T -- ) solve();
    return 0;
}

```

P10468 兔子与兔子

```

// 单 hash
#include <bits/stdc++.h>

using namespace std;

typedef unsigned long long ULL;
const int maxn = 1e6 + 5;
const int P = 131;
char s[maxn];
ULL p[maxn], h[maxn];

ULL get_hash(int l, int r) { return h[r] - h[l-1]*p[r-l+1]; }

```

```

int main()
{
    cin >> (s+1);
    int n = strlen(s+1);

    p[0] = h[0] = 1;
    for (int i = 1; i <= n; ++i) {
        p[i] = p[i-1]*P, h[i] = h[i-1]*P + s[i];
    }

    int m; cin >> m;
    while (m -- ) {
        int l1, r1, l2, r2; cin >> l1 >> r1 >> l2 >> r2;
        if (get_hash(l1,r1) == get_hash(l2,r2)) cout << "Yes" << endl;
        else cout << "No" << endl;
    }

    return 0;
}

```

```

// 双 hash
#include <bits/stdc++.h>
#define x first
#define y second

using namespace std;

typedef long long LL;
typedef pair<int, int> PII;
const int maxn = 1e6 + 5;
const int mod1 = 1e9+7, mod2 = 1e9+9;
const int P = 131;
char s[maxn];
PII p[maxn], h[maxn];

PII get_hash(int l, int r) {
    int h1 = (h[r].x - (LL)h[l-1].x*p[r-l+1].x%mod1 + mod1) % mod1;
    int h2 = (h[r].y - (LL)h[l-1].y*p[r-l+1].y%mod2 + mod2) % mod2;
    return {h1, h2};
}

int main()
{
    cin >> (s+1);
    int n = strlen(s+1);
    p[0] = h[0] = {1, 1};
    for (int i = 1; i <= n; i++) {
        h[i].x = ((LL)h[i-1].x*P + s[i]) % mod1;
        h[i].y = ((LL)h[i-1].y*P + s[i]) % mod2;
        p[i].x = (LL)p[i-1].x * P % mod1;
        p[i].y = (LL)p[i-1].y * P % mod2;
    }
}

```

```
int m; cin >> m;
while (m -- ) {
    int l1, r1, l2, r2; cin >> l1 >> r1 >> l2 >> r2;
    if (get_hash(l1,r1) == get_hash(l2,r2)) cout << "Yes" << endl;
    else cout << "No" << endl;
}
return 0;
}
```

P1908 逆序对

```
#include <bits/stdc++.h>

using namespace std;

typedef long long LL;
const int maxn = 5e5 + 5;
int a[maxn];
LL res = 0;

void merge_sort(int l, int r) {
    if (l >= r) return;

    int mid = (l+r) / 2;
    merge_sort(l, mid), merge_sort(mid+1, r);

    int i = l, j = mid+1;
    vector<int> vec;
    while (i<=mid && j<=r) {
        if (a[i] <= a[j]) vec.push_back(a[i]), i++;
        else vec.push_back(a[j]), j++, res += mid-i+1;
    }

    while (i <= mid) vec.push_back(a[i]), i++;
    while (j <= r) vec.push_back(a[j]), j++;

    for (int i = l, j = 0; i <= r; i++, j++) a[i] = vec[j];
}

int main()
{
    int n; cin >> n;
    for (int i = 1; i <= n; i++) cin >> a[i];
    merge_sort(1, n);
    cout << res << endl;
    return 0;
}
```