综合混练

人员

赵广宇、金一航、曹承贤、张皓宁、陈瀚霄、许岩、王彦臻、方冠霖、黄诗琦、卢炫佑、付丙霖、范家畅、李政毅、刘智予 到课

上周作业检查

上上周作业链接: https://vjudge.net/contest/720521

Begin: 2025-05-31 08:30 CST ☆ 2025-0531 五队上课 (综合混练) **End:** 2025-12-25 16:30 CST

Elapsed: 14:07:32:21 Running **Remaining:** 194:00:27:38

Overview Problem Status Rank (14:07:32:14) Discuss Setting Clone Update Delete

Rank	Team	Score	Penalty	A 12 / 41	B 17 / 19	C 12 / 19	D 8 / 13	E 4 / 10
1	☆ two_tiger (卢炫佑)	5	81407	7:11:04:37 (-9)	13:10:47:31	13:10:46:55	8:12:04:30 (-1)	13:12:43:31
2	☆ exLucas (范家畅)	4	41201	7:07:20:50 (-1)	6:14:22:58	7:07:32:11	**7:08:45:38 (-1)**	(-2)
3	☆ sty0948 (隋...	4	42983	7:01:17:25	**3:14:10:38**	**5:14:18:26 (-2)**		13:13:36:31 (-1)
4	☆ ccx123bc (曹承贤)	4	55766	11:13:11:01 (-1)	7:05:42:43	7:09:20:54	12:12:51:59	
5	☆ ikunTLE (方冠霖)	4	61791	(-8)	7:06:00:10	7:05:58:40	14:03:32:38	14:06:20:21
6	☆ dana230513 (金一航)	4	72050	7:06:16:03	14:05:51:07	14:06:03:34 (-2)	14:05:59:18	
7	☆ qp_an (赵广宇)	4	81867	14:05:04:32	14:05:04:46	14:05:04:15	14:05:14:20	
8	☆ longlong_int (刘锦轩)	3	41377		6:13:29:00	9:13:23:04		**12:13:45:06 (-3)**
9	☆ WangYanzhen (王彦臻)	3	41482	**6:24:24**	14:06:28:41	14:06:29:05		
10	☆ zhn123bc (张皓宁)	3	41664	(-1)	7:07:52:26	7:07:52:01 (-1)	14:05:40:04 (-2)	
11	☆ niuxiaochen (牛晓晨)	3	45557	12:12:15:30 (-1)	6:13:54:24		12:12:47:35	
12	☆ misaka16384 (黄诗琦)	3	51243	7:07:44:29	14:02:50:22	14:02:49:08 (-2)		
13	☆ lzy123bc (刘智予)	2	21235		7:08:56:41	7:08:58:42		
14	☆ chx123bc (_陈瀚霄)	2	34422	10:12:29:15 (-4)	13:07:52:48			
15	☆ lxr123bc (刘新睿)	2	38447	13:07:34:40 (-1)	13:08:53:02			
16	☆ fjj123bc (范家郡)	1	10192		7:01:52:00			
17	☆ fbl123bc (付丙霖)	1	10415		7:04:55:14 (-2)			
18	☆ FeatherCrow (许岩)	1	10636	7:08:16:05 (-3)			(-1)	

上周作业链接: https://vjudge.net/contest/721752

作业

https://vjudge.net/contest/722784 (课上讲了上周比赛的 A B C D E, 课后作业是本周比赛的 A B C D E 题)

课堂表现

今天的 5 道题目主要是 A 题比较复杂一些, 其他题目整体不是很难, 同学们课上做了一部分题, 但是没有全部做完, 没做完的部分课后一定要记得都补上。

课堂内容

CF1902D Robot Queries

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

using namespace std;

int get_int(char x) {
  if (x == 'U') return 0;
  if (x == 'D') return 1;
  if (x == 'L') return 2;
  return 3;
}

typedef pair<int, int> PII;
const int maxn = 2e5 + 5;
char s[maxn];
int dx[] = {0, 0, -1, 1}, dy[] = {1, -1, 0, 0};
PII w[maxn];
map<PII, vector<int>> mp;

int main()
{
  int n, T; cin >> n >> T;
  cin >> (s+1);

  mp[{0,0}].push_back(0);
  for (int i = 1, x = 0, y = 0; i <= n; ++i) {
    int u = get_int(s[i]);
    x += dx[u], y += dy[u]; w[i] = {x,y};
    mp[{x,y}].push_back(i);
  }

  while (T -- ) {
    int x, y, l, r; cin >> x >> y >> l >> r;
    vector<int>& vec = mp[{x,y}];
    if (!vec.empty() && (vec[0]<=l-1 || vec.back()>=r)) {
      cout << "YES" << endl; continue;
    }
```

```
    PII p1 = w[l-1], p2 = w[r];
    int diff_x = x - p1.x, diff_y = y - p1.y;
    int new_x = p2.x - diff_x, new_y = p2.y - diff_y;

    vector<int>& vec2 = mp[{new_x,new_y}];
    if (!vec2.empty()) {
      auto it = lower_bound(vec2.begin(), vec2.end(), l);
      if (it!=vec2.end() && *it<=r) { cout << "YES" << endl; continue; }
    }

    cout << "NO" << endl;
  }
  return 0;
}
```

CF463D Gargari and Permutations

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

using namespace std;

const int maxn = 1000 + 5;
int w[maxn];
bool st[maxn][maxn];
vector<int> vec[maxn];
int deg[maxn], f[maxn];

int main()
{
  int n, m; cin >> n >> m;
  for (int i = 1; i <= n; ++i) {
    for (int j = 1; j <= n; ++j) {
      if (i != j) st[i][j] = true;
    }
  }

  for (int i = 1; i <= m; ++i) {
    for (int j = 1; j <= n; ++j) cin >> w[j];
    for (int j = 1; j <= n; ++j) {
      for (int k = j+1; k <= n; ++k) st[w[k]][w[j]] = false;
    }
  }

  for (int i = 1; i <= n; ++i) {
    for (int j = 1; j <= n; ++j) {
      if (st[i][j]) ++deg[j], vec[i].push_back(j);
    }
  }

  queue<int> q;
  for (int i = 1; i <= n; ++i) {
```

```
    if (!deg[i]) f[i] = 1, q.push(i);
  }
  while (!q.empty()) {
    int u = q.front(); q.pop();
    for (int i : vec[u]) {
      f[i] = max(f[i], f[u]+1);
      --deg[i];
      if (!deg[i]) q.push(i);
    }
  }

  int res = 0;
  for (int i = 1; i <= n; ++i) res = max(res, f[i]);
  cout << res << endl;
  return 0;
}
```

CF547B Mike and Feet

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

using namespace std;

const int maxn = 2e5 + 5;
int w[maxn];
int pre[maxn], suf[maxn];
int f[maxn];

int main()
{
  int n; cin >> n;
  for (int i = 1; i <= n; ++i) cin >> w[i];

  stack<int> stk;
  for (int i = 1; i <= n; ++i) {
    while (!stk.empty() && w[i]<=w[stk.top()]) stk.pop();
    pre[i] = (stk.empty() ? 0 : stk.top());
    stk.push(i);
  }

  while (!stk.empty()) stk.pop();
  for (int i = n; i >= 1; --i) {
    while (!stk.empty() && w[i]<=w[stk.top()]) stk.pop();
    suf[i] = (stk.empty() ? n+1 : stk.top());
    stk.push(i);
  }

  for (int i = 1; i <= n; ++i) {
    int l = pre[i]+1, r = suf[i]-1;
    f[r-l+1] = max(f[r-l+1], w[i]);
  }
```

```
  for (int i = n; i >= 1; --i) f[i] = max(f[i+1], f[i]);
  for (int i = 1; i <= n; ++i) cout << f[i] << " "; cout << endl;
  return 0;
}
```

CF540D Bad Luck Island

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

using namespace std;

const int maxn = 100 + 5;
double f[maxn][maxn][maxn];

int main()
{
  int r, s, p; cin >> r >> s >> p;
  f[r][s][p] = 1;

  double a = 0, b = 0, c = 0;
  for (int i = r; i >= 0; --i) {
    for (int j = s; j >= 0; --j) {
      for (int k = p; k >= 0; --k) {
        if (!i && !j && !k) continue;

        int n = i + j + k;
        double p1 = i, p2 = j, p3 = k;
        double pn = p1*p2 + p1*p3 + p2*p3;
        // (i,j,k) -> (i-1,j,k)  (i,j-1,k)  (i,j,k-1)
        if (i && k) f[i-1][j][k] += f[i][j][k]*p1*p3/pn;
        if (i && j) f[i][j-1][k] += f[i][j][k]*p1*p2/pn;
        if (j && k) f[i][j][k-1] += f[i][j][k]*p2*p3/pn;

        if (!j && !k) a += f[i][j][k];
        if (!i && !k) b += f[i][j][k];
        if (!i && !j) c += f[i][j][k];
      }
    }
  }

  printf("%.12f %.12f %.12f\n", a, b, c);
  return 0;
}
```

CF3B Lorry

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

using namespace std;

typedef long long LL;
const int maxn = 1e5 + 5;
struct node {
  int value, id;
  bool operator < (const node& p) const { return value < p.value; }
};
vector<node> vec[3];
LL p[3][maxn];

int main()
{
  int n, m; cin >> n >> m;
  for (int i = 1; i <= n; ++i) {
    int id, x; cin >> id >> x; vec[id].push_back({x, i});
  }
  for (int i = 1; i <= 2; ++i) {
    sort(vec[i].begin(), vec[i].end()); reverse(vec[i].begin(), vec[i].end());
    for (int j = 1; j <= (int)vec[i].size(); ++j) {
      int x = vec[i][j-1].value; p[i][j] = p[i][j-1] + x;
    }
  }

  LL res = -1; int resId = -1;
  for (int i = 0; i <= min((int)vec[1].size(), m); ++i) {
    LL sum = p[1][i] + p[2][min((m-i)/2, (int)vec[2].size())];
    if (sum > res) res = sum, resId = i;
  }
  cout << res << endl;

  for (int i = 1; i <= resId; ++i) cout << vec[1][i-1].id << " ";
  for (int i = 1; i <= min((m-resId)/2, (int)vec[2].size()); ++i) cout << vec[2]
[i-1].id << " ";
  cout << endl;
    return 0;
}
```