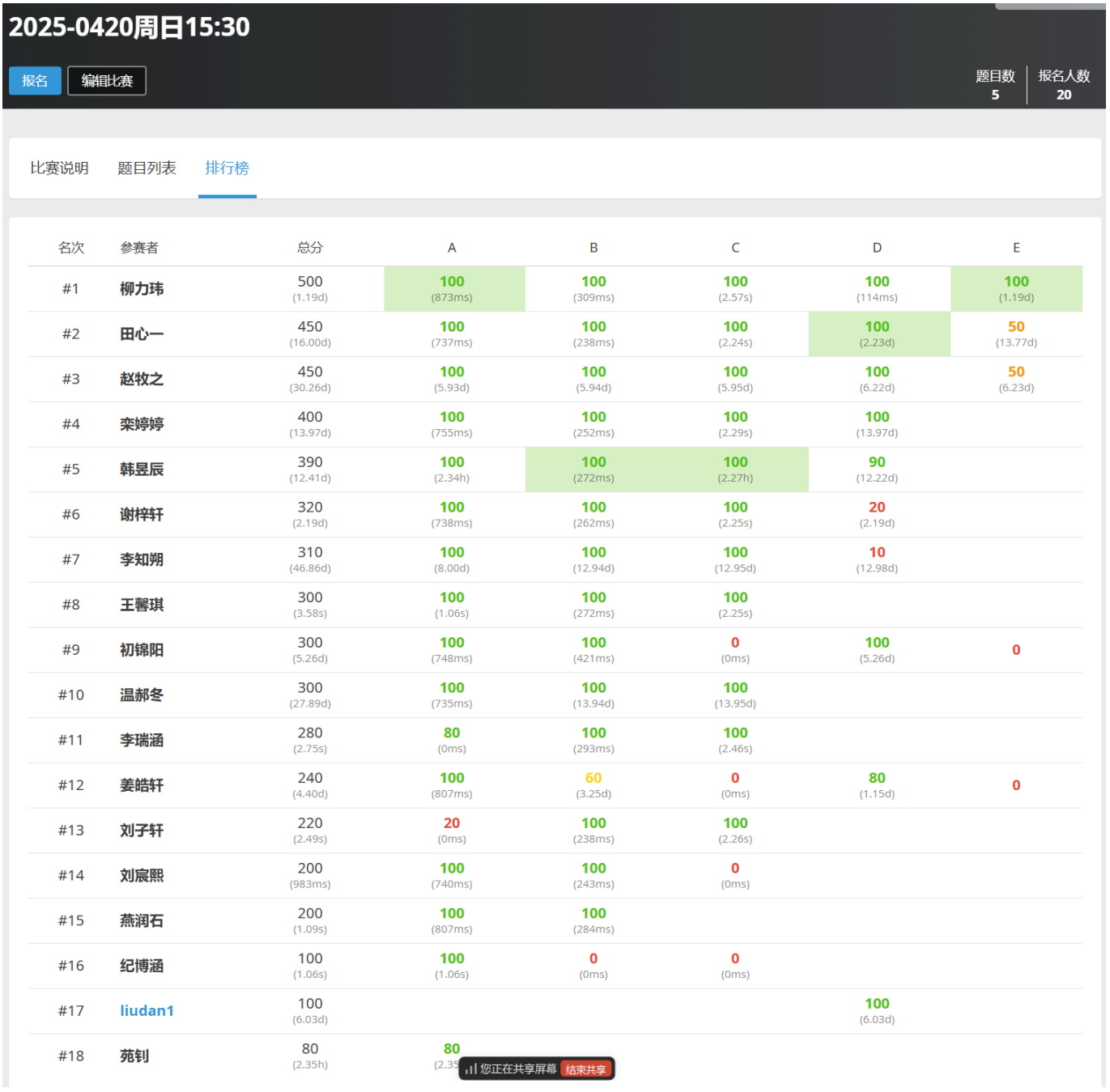
蚂蚁

人员

王馨琪、刘宸熙、柳力玮、田心一、姜皓轩、谢梓轩、李知朔、李瑞涵 到课, 栾婷婷、刘子轩、赵牧之、温郝冬 线上

上周作业检查

上周作业链接: https://www.luogu.com.cn/contest/242934



2025-0420周日15:30

报名 编辑比赛

题目数 5 | 报名人数 20

比赛说明 题目列表 排行榜

名次	参赛者	总分	A	B	C	D	E
#1	柳力玮	500 (1.19d)	100 (873ms)	100 (309ms)	100 (2.57s)	100 (114ms)	100 (1.19d)
#2	田心一	450 (16.00d)	100 (737ms)	100 (238ms)	100 (2.24s)	100 (2.23d)	50 (13.77d)
#3	赵牧之	450 (30.26d)	100 (5.93d)	100 (5.94d)	100 (5.95d)	100 (6.22d)	50 (6.23d)
#4	栾婷婷	400 (13.97d)	100 (755ms)	100 (252ms)	100 (2.29s)	100 (13.97d)	
#5	韩昱辰	390 (12.41d)	100 (2.34h)	100 (272ms)	100 (2.27h)	90 (12.22d)	
#6	谢梓轩	320 (2.19d)	100 (738ms)	100 (262ms)	100 (2.25s)	20 (2.19d)	
#7	李知朔	310 (46.86d)	100 (8.00d)	100 (12.94d)	100 (12.95d)	10 (12.98d)	
#8	王馨琪	300 (3.58s)	100 (1.06s)	100 (272ms)	100 (2.25s)		
#9	初锦阳	300 (5.26d)	100 (748ms)	100 (421ms)	0 (0ms)	100 (5.26d)	0
#10	温郝冬	300 (27.89d)	100 (735ms)	100 (13.94d)	100 (13.95d)		
#11	李瑞涵	280 (2.75s)	80 (0ms)	100 (293ms)	100 (2.46s)		
#12	姜皓轩	240 (4.40d)	100 (807ms)	60 (3.25d)	0 (0ms)	80 (1.15d)	0
#13	刘子轩	220 (2.49s)	20 (0ms)	100 (238ms)	100 (2.26s)		
#14	刘宸熙	200 (983ms)	100 (740ms)	100 (243ms)	0 (0ms)		
#15	燕润石	200 (1.09s)	100 (807ms)	100 (284ms)			
#16	纪博涵	100 (1.06s)	100 (1.06s)	0 (0ms)	0 (0ms)		
#17	liudan1	100 (6.03d)				100 (6.03d)	
#18	苑钊	80 (2.35h)	80 (2.3				

您正在共享屏幕 结束共享

作业

https://www.luogu.com.cn/contest/244895 (课上讲了 A ~ D 题, 课后作业是 E 题)

课堂表现

今天 B、C 2 道题比较简单一点, 同学们课上普遍都做的比较好

A、D 2 道题比较复杂, 同学们课上听基本都听懂了, 不过时间不够基本都没有做完, 课下要好好补一补这 2 道题。

课堂内容

U513572 代价（cost）

从 1~n 枚举最终变成哪一个, 然后利用前缀和可以 O(1) 求全变成 w[i] 时的代价

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

using namespace std;

typedef long long LL;
const int maxn = 1e5 + 5;
LL w[maxn], p[maxn];

LL get_sum(int l, int r) {
  if (l <= r) return p[r] - p[l-1];
  return 0;
}

int main()
{
  int n, A, B; cin >> n >> A >> B;
  for (int i = 1; i <= n; ++i) cin >> w[i];
  sort(w+1, w+n+1);
  for (int i = 1; i <= n; ++i) p[i] = p[i-1] + w[i];

  LL res = 4e18;
  for (int i = 1; i <= n; ++i) {
    // 把 w[1]~w[i-1] 全变为 w[i] 的值, w[i+1]~w[n] 全变为 w[i] 的值
    LL pre_sum = get_sum(1, i-1), tar_pre_sum = (LL)w[i]*(i-1);
    LL suf_sum = get_sum(i+1, n), tar_suf_sum = (LL)w[i]*(n-i);

    LL diff_a = tar_pre_sum - pre_sum, diff_b = suf_sum - tar_suf_sum;
    res = min(res, diff_a*A + diff_b*B);
  }
  cout << res << endl;
  return 0;
}
```

P2708 硬币翻转

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

using namespace std;

const int maxn = 1e6 + 5;
char s[maxn];

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

  int res = 0;
  for (int i = 2; i <= n; ++i) {
    if (s[i] != s[i-1]) res++;
  }
  if (s[n] == '0') res++;

  cout << res << endl;
  return 0;
}
```

P3662 [USACO17FEB] Why Did the Cow Cross the Road II S

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

using namespace std;

const int maxn = 1e5 + 5;
int w[maxn], p[maxn];

int get_sum(int l, int r) { return p[r] - p[l-1]; }

int main()
{
  int n, k, B; cin >> n >> k >> B;
  for (int i = 1; i <= B; ++i) {
    int x; cin >> x; w[x] = 1;
  }
  for (int i = 1; i <= n; ++i) p[i] = p[i-1] + w[i];

  int res = 1000000;
  for (int i = 1; i+k-1 <= n; ++i) {
    res = min(res, get_sum(i,i+k-1));
  }
  cout << res << endl;
  return 0;
}
```

P1367 蚂蚁

首先, 两只蚂蚁碰面后交换, 可以认为是没有发生交换, 那么 n 只蚂蚁最终的位置我们就可以确定了

然后, n 只蚂蚁的相对位置一定是不变的, 前面的还在前面, 后面的还在后面

这样处理一下, 就可以完成这个题了

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

using namespace std;

const int maxn = 1e5 + 5;
struct node {
    int pos, c, id;
} w[maxn], a[maxn];
bool cmp(node p, node q) { return p.pos < q.pos; }
bool cmp2(node p, node q) { return p.id < q.id; }

int main()
{
    int n, k; cin >> n >> k;
    for (int i = 1; i <= n; ++i) {
        cin >> w[i].pos >> w[i].c; w[i].id = i;
    }
    sort(w+1, w+n+1, cmp);

    for (int i = 1; i <= n; i++) {
        if (w[i].c == -1) a[i].pos = w[i].pos - k;
        else a[i].pos = w[i].pos + k;
        a[i].c = w[i].c;
    }
    sort(a+1, a+n+1, cmp);
    for (int i = 2; i <= n; i++) {
        if (a[i].pos==a[i-1].pos) a[i].c = a[i-1].c = 0;
    }
    // a 数组代表 k 秒之后每只蚂蚁的位置和方向

    /*
        w[1] ~ a[1]
        w[2] ~ a[2]
        ...
        w[n] ~ a[n]
    */
    for (int i = 1; i <= n; i++) a[i].id = w[i].id;
    sort(a+1, a+n+1, cmp2);
    for (int i = 1; i <= n; i++) cout << a[i].pos << " " << a[i].c << endl;
  return 0;
}
```