ADS期末辅学题目集——编程题标程

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Hand-made Cream

```
#include <stdio.h>

#define MAXN 1010
#define int long long
#define MAX(a,b) ((a)>=(b)?(a):(b))

int N1, N2;
int x1[MAXN], y1[MAXN], y2[MAXN];

signed main()
{
    int *t1 = y1, *t2 = y2, t;
    int ti;
    scanf("%lld %lld", &N1, &N2);
    for(int i = 1; i <= N1; i++) {
        scanf("%lld", x1 + i);
    }
    for(int i = 1; i <= N2; i++) {
        scanf("%lld", &ti);
        for(int j = 1; j <= N1; j++) {
            t2[j] = MAX(t2[j - 1], MAX(t1[j], t1[j - 1] + x1[j] * ti));
        }
        t = t1; t1 = t2; t2 = t;
    }
    printf("%lld\n", t1[N1]);
}
```

Binary String

https://codeforces.com/contest/1680/problem/C

```c
#include <stdio.h>
int N;
char s[200100];
int n, a0[200100], c, m;
int main()
{
    scanf("%d", &N);
    getchar();
    while(N-- > 0) {
        scanf("%s", s);
        for(n = 0; s[n]; n++);
        a0[0] = (s[0] == '0');
        c = (s[0] == '1');
        for(int i = 1; i < n; i++) {
            a0[i] = (s[i] == '0' ? a0[i - 1] + 1 : a0[i - 1]);
            c += (s[i] == '1');
        }
        m = c;
        if (m > a0[c - 1]) m = a0[c - 1];
        for(int i = 0; i + c < n; i++) {
            if (m > a0[i + c] - a0[i]) m = a0[i + c] - a0[i];
        }
        printf("%d\n", m);
    }
}
```

Maximum Crossings

(Easy Version)

https://codeforces.com/contest/1676/problem/H1

```c
#include <stdio.h>

int N, n, t[1010], c;

int main()
{
    scanf("%d", &N);
    while(N-- > 0) {
        scanf("%d", &n);
        c = 0;
        for(int i = 1; i <= n; i++) {
            scanf("%d", &t[i]);
            for(int j = 1; j < i; j++) {
                if (t[i] <= t[j]) c++;
            }
```

```
        }
        printf("%d\n", c);
    }
}
```

(Hard Version, using C++)

https://codeforces.com/contest/1676/problem/H2

这个标程不是按归并排序的方法来的，而是使用了二分搜索处理，复杂度是$O(n \log^2 n)$，比较差，但也不会超时。

```
#include <cstdio>
#include <cstring>
#include <algorithm>
using namespace std;

int N, n, a[200100], t[200100]; long long c;

long long solve(int l, int r) // [l, r] both included
{
    long long res = 0;
    int ll, rr, mm, tt;
    int m = l + (r - l) / 2;
    if (l >= r) return 0;
    res = solve(l, m) + solve(m + 1, r);
    for(int i = l; i <= m; i++) {
        t[i] = a[i];
    }
    sort(t + l, t + m + 1);
    for(int i = m + 1; i <= r; i++) {
        ll = l; rr = m;
        tt = a[i];
        mm = ll + (rr - ll) / 2;
        if (tt <= t[ll]) mm = ll - 1;
        else if (tt > t[rr]) mm = rr;
        else {
            while(ll < rr) {
                mm = ll + (rr - ll) / 2;
                if(tt > t[mm] && tt <= t[mm + 1]) break;
                else if(tt <= t[mm]) rr = mm;
                else ll = mm + 1;
            }
        }
        res += m - mm;
    }
    return res;
}

int main()
{
```

```
    scanf("%d", &N);
    while(N-- > 0) {
        scanf("%d", &n);
        c = 0;
        for(int i = 1; i <= n; i++) {
            scanf("%d", a + i);
        }
        printf("%lld\n", solve(1, n));
    }
}
```