

# 优先队列

## 人员

刘祺、牛同泽、齐振玮、夏志赫、武敬哲、秦显森、徐浩然、谢亚锴、高健桓、李青默、辛帅辰、夏硕承、牟茗、方俊喆、董浩桢 到课，郑泽楷 线上

## 作业检查

上周作业链接: <https://www.luogu.com.cn/contest/215772>

2024-1124周日10:30

报名

编辑比赛

题目数7 | 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	F	G
#1	齐振玮	700 (11.92h)	100 (26.12min)	100 (34.42min)	100 (49.75min)	100 (1.40h)	100 (1.88h)	100 (2.10h)	100 (4.70h)
#2	刘祺	700 (5.62d)	100 (25.30min)	100 (32.20min)	100 (53.73min)	100 (1.39d)	100 (1.35d)	100 (1.37d)	100 (1.43d)
#3	谢亚锴	700 (11.36d)	100 (26.15min)	100 (33.53min)	100 (50.63min)	100 (5.41d)	100 (1.90h)	100 (5.40d)	100 (9.41h)
#4	赵照羽	700 (18.20d)	100 (17.28min)	100 (19.80min)	100 (47.65min)	100 (6.04d)	100 (2.20h)	100 (6.00d)	100 (6.01d)
#5	郑泽楷	600 (18.91d)	100 (38.57min)	100 (59.68min)	100 (1.29h)	100 (6.30d)	100 (6.31d)	100 (6.18d)	
#6	夏硕承	600 (20.32d)	100 (25.37min)	100 (31.73min)	100 (44.47min)		100 (6.29d)	100 (6.98d)	100 (6.98d)
#7	武敬哲	590 (16.40d)	100 (31.83min)	100 (30.68min)	100 (44.48min)	90 (5.43d)		100 (5.44d)	100 (5.45d)
#8	高健桓	590 (19.96d)	100 (29.42min)	100 (33.47min)	100 (51.22min)	90 (6.92d)	100 (6.03d)	100 (6.93d)	
#9	夏志赫	524 (17.14d)	100 (33.17min)	100 (33.33min)	100 (52.98min)	70 (5.48d)		54 (5.55d)	100 (6.03d)
#10	辛帅辰	400 (6.59d)	100 (36.67min)	100 (36.45min)	100 (54.62min)		100 (6.50d)		
#11	ntz123bc	400 (24.86d)	100 (6.25d)	100 (6.25d)	100 (6.27d)		100 (6.29d)		
#12	秦显森	350 (4.38h)	100 (37.32min)	100 (31.57min)	50 (1.04h)		100 (2.19h)		
#13	李青默	310 (10.49d)	100 (35.08min)	100 (42.97min)		10 (3.45d)	100 (6.99d)		
#14	崔宸赫	300 (1.89h)	100 (26.68min)	100 (32.18min)	100 (54.72min)				
#15	徐浩然	300 (12.75h)	100 (26.30min)	100 (32.50min)			100 (11.77h)		
#16	牟茗	300 (20.77d)	100 (6.92d)	100 (6.93d)	100 (6.93d)				
#17	方俊喆	90 (5.49d)	90 (5.49d)						

## 作业

<https://www.luogu.com.cn/contest/217571>

## 课堂表现

同学们课上听讲都很认真，今天的第 2 题 珍珠链2 很重要，同学们课下要好好研究一下这道题。

## 课堂内容

### U510530 珍珠链

```
#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 = 1; i <= n; ++i) {
        for (int j = i+1; j <= n; ++j) {
            int sum = 0;
            for (int k = i; k <= j; ++k) {
                if (s[k] == 'G') sum++;
                else sum--;
            }
            if (sum == 0) res = max(res, j-i+1);
        }
    }
    cout << res << endl;
    return 0;
}
```

### U510529 珍珠链2

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

using namespace std;

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

int main()
{
    cin >> (str+1);
    int n = strlen(str+1);
    for (int i = 1; i <= n; ++i) {
        if (str[i] == 'G') f[i] = f[i-1] + 1;
        else f[i] = f[i-1] - 1;
    }
}
```

```
map<int, int> mp;
mp[0] = 0;
int res = 0;
for (int i = 1; i <= n; ++i) {
    int t = f[i];
    if (mp.count(t)) {
        res = max(res, i-mp[t]);
    } else {
        mp[t] = i;
    }
}
cout << res << endl;
return 0;
}
```

## 优先队列

头文件: #include <queue>

定义小根堆: priority\_queue<int, vector<int>, greater<int>> q;

定义大根堆: priority\_queue<int, vector<int>, less<int>> q;

使用方法: push, pop, empty, size, top

## P3378 【模板】堆

```
#include<iostream>
#include<string>
#include<map>
#include<queue>
using namespace std;

int main(){
    priority_queue<int,vector<int>,greater<int>> pq;
    int T;
    cin>>T;
    while (T--){
        int t,x;
        cin>>t;
        if (t==1){
            cin>>x;
            pq.push(x);
        }
        if (t==2){
            cout<<pq.top()<<endl;
        }
        if (t==3){
            pq.pop();
        }
    }
}
```

```
    }  
}  
return 0;  
}
```

**P1090 [NOIP2004 提高组] 合并果子 / [USACO06NOV] Fence Repair G**

```
#include <bits/stdc++.h>  
  
using namespace std;  
  
int main()  
{  
    priority_queue<int, vector<int>, greater<int>>q;  
    int n; cin >> n;  
    while (n -- ) { int x; cin >> x; q.push(x); }  
  
    int res = 0;  
    while (q.size() > 1) {  
        int t1 = q.top(); q.pop();  
        int t2 = q.top(); q.pop();  
        int t = t1 + t2;  
        q.push(t); res += t;  
    }  
    cout << res << endl;  
    return 0;  
}
```