

# 2017-2018 ACM-ICPC, NEERC, Northern Subregional Contest

## 比赛情况

题号	A	B	C	D	E	F	G	H	I	J	K	L
状态	0	0	0	-	0	-	-	0	0	-	0	0

0 在比赛中通过 0 赛后通过! 尝试了但是失败了- 没有尝试

### 比赛时间

2020-06-24 13:00-18:00

### 提交记录

## 题解

### A. Auxiliary Project

恰好用点亮  $n$  根数码管能构成的数字的和最大是多少。

$\text{dp}$  一下就可以了。

```
#include<bits/stdc++.h>
#define ll long long
#define pii_ pair<int,int>
#define mp_ make_pair
#define pb push_back
#define fi first
#define se second
#define rep(i,a,b) for(int i=(a);i<=(b);i++)
#define per(i,a,b) for(int i=(a);i>=(b);i--)
#define show1(a) cout<<#a<<" = "<<a<<endl
#define show2(a,b) cout<<#a<<" = "<<a<<"; "<<#b<<" = "<<b<<endl
using namespace std;
const ll INF = 1LL<<60;
const int inf = 1<<30;
const int maxn = 1e6+5;
inline void fastio() {ios::sync_with_stdio(false);cin.tie(0);cout.tie(0);}

int dig[10] = {6,2,5,5,4,5,6,3,7,6};
ll f[maxn];
int main()
{
    fastio();
```

```
freopen("auxiliary.in", "r", stdin);
freopen("auxiliary.out", "w", stdout);
int n; cin >> n;
rep(i, 1, n) {
    rep(j, 0, 9) {
        if (i >= dig[j] && (f[i - dig[j]] || i == dig[j])) f[i] = max(f[i], f[i - dig[j]] + j);
    }
}
cout << f[n] << endl;
return 0;
}
```

## B. Boolean Satisfiability

题目大意

数据范围

题解

代码

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <algorithm>
using namespace std;
char s[1005];
int ts[300], fs[300];
int main()
{
    freopen("boolean.in", "r", stdin);
    freopen("boolean.out", "w", stdout);
    scanf("%s", s);
    for (int i = 0; s[i]; i++)
    {
        if (s[i] == '~')
        {
            fs[s[i + 1]]++;
            i++;
        }
        else if ((s[i] >= 'a' && s[i] <= 'z') || (s[i] >= 'A' && s[i] <= 'Z'))
        {
            ts[s[i]]++;
        }
    }
}
```

```

        ts[s[i]]++;
    }
    long long ans = 1;
    int dec = 1;
    for (int i = 'a'; i <= 'z'; i++)
    {
        if (ts[i] && fs[i]) dec = 0;
        if (ts[i] || fs[i]) ans = ans << 1;
    }
    for (int i = 'A'; i <= 'Z'; i++)
    {
        if (ts[i] && fs[i]) dec = 0;
        if (ts[i] || fs[i]) ans = ans << 1;
    }
    printf("%lld\n", ans - dec);
    return 0;
}

```

## C. Consonant Fencity

题目大意

数据范围

题解

代码

```

#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <algorithm>
using namespace std;
const int N = 1e6+5;
int myno[300];
int ps[25][25];
char s[N];
bool isbig[25];
int main()
{
    freopen("consonant.in", "r", stdin);
    freopen("consonant.out", "w", stdout);
    int cnt = 0;
    for (int i = 'a'; i <= 'z'; i++)
    {

```

```
    if (i == 'a' || i == 'e' || i == 'i' || i == 'o' || i == 'u' || i
== 'w' || i == 'y')
        continue;
    myno[i] = ++cnt;
}
scanf("%s",s);
for (int i = 1;s[i];i++)
    if (myno[s[i]] && myno[s[i-1]]) {
        if (s[i] > s[i-1])ps[myno[s[i-1]]][myno[s[i]]]++;
        else ps[myno[s[i]]][myno[s[i-1]]]++;
    }
int maxf = -1;
int ans = 0;
for (int i = 0;i < (1<<19);i++) {
    for (int j = 0;j < 19;j++)
    {
        if ((i >> j) & 1)
            isbig[j+1] = true;
        else
            isbig[j+1] = false;
    }
    int tmpf = 0;
    for (int j = 1;j<= 19;j++)
        for (int k = j+1;k<= 19;k++)
            if (isbig[j]^isbig[k])
                tmpf += ps[j][k];
    if (tmpf > maxf) {
        maxf = tmpf;
        ans = i;
    }
}
for (int j = 0;j < 19;j++)
{
    if ((ans >> j) & 1)
        isbig[j+1] = true;
    else
        isbig[j+1] = false;
}
for (int i = 0;s[i];i++)
{
    if (isbig[myno[s[i]]])
        printf("%c",s[i]- 'a'+ 'A');
    else printf("%c",s[i]);
}
return 0;
}
```

## H. Hidden Supervisors

一个森林合并成一棵树，且求最大的匹配数，匹配是指取一个父亲和它的一个儿子。一个节点不能匹配多次。

先处理每棵树，猜一个贪心的结论，从叶子开始往上，能和自己的父亲匹配就立刻匹配。合并树的时候，每次合并最多有  $1$  的贡献，贪心地让每个没有被匹配过的树根去连接另一棵树没有被匹配过的节点。但注意最后要形成一棵树，比赛的时候写了好多次才过(而且写得很复杂)。。。

```

#include<bits/stdc++.h>
#define ll long long
#define pii_ pair<int,int>
#define mp_ make_pair
#define pb push_back
#define fi first
#define se second
#define TIMES 10
#define rep(i,a,b) for(int i=(a);i<=(b);i++)
#define per(i,a,b) for(int i=(a);i>=(b);i--)
#define show1(a) cout<<#a<<" = "<<a<<endl
#define show2(a,b) cout<<#a<<" = "<<a<<" "; cout<<#b<<" = "<<b<<endl
using namespace std;
const ll INF = 1LL<<60;
const int inf = 1<<30;
const int maxn = 1e5+5;
inline void fastio() {ios::sync_with_stdio(false);cin.tie(0);cout.tie(0);}

int n,p[maxn],has[maxn],ans,belong[maxn];
vector<int> g[maxn],no[maxn];
void dfs(int u,int f,int rt)
{
    belong[u] = rt;
    for(int v:g[u]){
        dfs(v,u,rt);
    }
    if(!has[u] && (f!=0&&!has[f])) has[u]=has[f]=1,ans++;
    if(!has[u]) no[rt].pb(u);
}
struct node
{
    int id;
    bool operator < (node e) const
    {
        return no[id].size()>no[e.id].size();
    }
};
#define LOCAL
int main()
{
    fastio();

```

```
#ifdef LOCAL
freopen("hidden.in", "r", stdin);
freopen("hidden.out", "w", stdout);
#endif

cin>>n;
vector<int> root;
rep(i,2,n){
    cin>>p[i];
    if(!p[i]) root.pb(i);
    else g[p[i]].pb(i);
}
vector<int> tot,rest;
dfs(1,0,1); for(int x:no[1]) tot.pb(x);
int cnt = 0;
for(int x:root){
    dfs(x,0,x);
    if(has[x]){
        for(int y:no[x]) tot.pb(y);
        p[x] = 1;
    }else rest.pb(x);
}
auto cmp = [&] (int x,int y) {return no[x].size()>no[y].size();};
sort(rest.begin(),rest.end(),cmp);
for(int x:rest){
    if(tot.size()){
        p[x] = tot.back(); tot.pop_back(); ans++;
    }else{
        p[x] = 1; tot.pb(x);
    }
    for(int y:no[x]){
        if(y!=x) tot.pb(y);
    }
}
cout<<ans<<endl;
rep(i,2,n) cout<<p[i]<<" \n"[i==n];
return 0;
}
/*
7
0 0 0 0 0 0
*/
```

## I. Intelligence in Perpendicularia

## 题目大意

在坐标系里放一圈平行于x轴或y轴的栅栏，人分别站在 $(0, \infty)$ ,  $(0, -\infty)$ ,  $(\infty, 0)$ ,  $(-\infty, 0)$ 四个位置看栅栏，问有多长的栅栏不论站在这四个位置哪里都没法看到。

## 数据范围

n节栅栏  $1 \leq n \leq 1000$

栅栏坐标  $-10^6 \leq x_i, y_i \leq 10^6$

## 题解

由于栅栏只有平行于x轴和y轴的，而且栅栏围成了一个封闭图形，所以必有一种平移方案把栅栏移动成一个矩形和剩余的一些栅栏，易知人能看到的就是这个矩形的长度，所以剩余的就是看不到的栅栏。我们只需要计算总的栅栏长度和这个矩形的周长接口。

## 代码

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <algorithm>
using namespace std;
typedef long long ll;
const int N = 1005;
int x[N], y[N];
int main()
{
    freopen("intel.in", "r", stdin);
    freopen("intel.out", "w", stdout);
    int n;
    scanf("%d", &n);
    int maxx = -1e7;
    int maxy = -1e7;
    int minx = 1e7;
    int miny = 1e7;
    for (int i = 1; i <= n; i++)
    {
        scanf("%d%d", &x[i], &y[i]);
        maxx = max(maxx, x[i]);
        minx = min(minx, x[i]);
        maxy = max(maxy, y[i]);
        miny = min(miny, y[i]);
    }
    int ans = 0;
    x[n+1] = x[1], y[n+1] = y[1];
```

```
for (int i = 1;i <= n;i++)
    ans += (abs(x[i]-x[i+1])+abs(y[i]-y[i+1]));
ans -= (maxx-minx + maxy-miny)*2;
if (maxx == minx || maxy == miny) ans = 0;
printf("%d\n",ans);
return 0;
}
```

## replay

## 比赛总结

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