A.masterex

```cpp
//Coded by dst
#include<algorithm>
#include<iostream>
#include<cstdio>
using namespace std;
typedef long long ll;
int n,ans;
ll a[500005][4],s[500005];
int main(){
    freopen("masterex.in","r",stdin);
    freopen("masterex.out","w",stdout);
    int i,j;
    ll sum;
    scanf("%d",&n);
    for(j=1;j<=3;j++)
        for(i=1;i<=n;i++)
            scanf("%lld",&a[i][j]);
    for(i=1;i<=n;i++)
        s[i]=a[i][1]+a[i][2]+a[i][3]-max(a[i][1],max(a[i][2],a[i][3]));
    sort(s+1,s+n+1);
    for(i=1;i<=n;i++){
        sum=a[i][1]+a[i][2]+a[i][3];
        ans=upper_bound(s+1,s+n+1,sum-2)-s-1;
        ans-=max(a[i][1],max(a[i][2],a[i][3]))>=2;
        printf("%d%c",ans,i==n?'\n':' ');
    }
    return 0;
}
```

B.planex

DFS枚举

```cpp
//Coded by dst
#include<cstdio>
using namespace std;
typedef long long ll;
int n,k,d[20];
ll ans,a[20];
ll gcd(ll a,ll b){
    return b?gcd(b,a%b):a;
}
ll lcm(ll a,ll b){
    return a/gcd(a,b)*b;
}
ll dfs(int step,int num){
    int i;
    ll res=0;
    if(step>num){
        ll res=a[d[1]];
        for(i=2;i<=num;i++){
```

```
19          if(res>n)
20              return 0;
21          res=lcm(res,a[d[i]]);
22      }
23      return n/res;
24    }
25    for(i=d[step-1]+1;i<=k-(num-step);i++){
26      d[step]=i;
27      res+=dfs(step+1,num);
28    }
29    return res;
30 }
31 int main(){
32    freopen("planex.in","r",stdin);
33    freopen("planex.out","w",stdout);
34    int i,T;
35    scanf("%d",&T);
36    while(T--){
37      scanf("%d%d",&n,&k);
38      ans=n;
39      for(i=1;i<=k;i++)
40          scanf("%lld",&a[i]);
41      for(i=1;i<=k;i++)
42          ans+=dfs(1,i)*(i%2?-1:1);
43      printf("%lld\n",ans);
44    }
45    return 0;
46 }
```

cyn神仙的状压枚举（推荐）

```
1  #include <bits/stdc++.h>
2  using namespace std;
3
4  #define ll long long
5  #define up(i, x, y) for(int i = x; i <= y; ++i)
6  #define down(i, x, y) for(int i = x; i >= y; --i)
7  #define gc getchar()
8  #define pc putchar
9  #define fi first
10 #define se second
11 #define ek emplace_back
12 #define pk push_back
13 #define mk make_pair
14 #define N 100005
15
16 int T;
17 ll a[N];
18 inline ll gcd(ll x, ll y) {return y == 0 ? x : gcd(y, x % y);}
19 inline void solve() {
20     int n, k;
21     cin >> n >> k;
22     up(i, 1, k) cin >> a[i];
23     ll ans = 0;
24     up(i, 1, (1 << k) - 1) {
25         bool flag = 0;
26         ll res = 1; int tot = 0;
```

```
27          up(j, 1, k) if(i >> (j - 1) & 1) {
28              res = res / gcd(res, a[j]) * a[j];
29              ++tot;
30              if(res > n) {flag = 1; break;}
31          }
32          if(flag) continue;
33          if(tot & 1) ans += n / res;
34          else ans -= n / res;
35      }
36      cout << n - ans << '\n';
37  }
38  int main() {
39      ios::sync_with_stdio(0), cin.tie(0), cout.tie(0);
40      cin >> T;
41      while(T--) solve();
42      return 0;
43  }
```

C.or

```
1   //Coded by dst
2   #include<iostream>
3   #include<cstring>
4   #include<cstdio>
5   #include<cmath>
6   using namespace std;
7   const int w[4][2]={{0,1},{0,-1},{-1,0},{1,0}},N=505;
8   int n,m,d[N][N];
9   int p,ans;
10  bool b[35],mp[N][N],Mp[N][N],vis[N][N];
11  void cpy(bool a[][N],bool b[][N]){
12      for(int i=1;i<=n;i++)
13          for(int j=1;j<=m;j++)
14              b[i][j]=a[i][j];
15  }
16  void add(int bit,bool mp[][N]){
17      for(int i=1;i<=n;i++)
18          for(int j=1;j<=m;j++)
19              mp[i][j]|=d[i][j]>>bit&1;
20  }
21  bool check(int x,int y){
22      if(Mp[x][y]||vis[x][y])
23          return 0;
24      vis[x][y]=1;
25      if(x==n&&y==m)
26          return 1;
27      bool res=0;
28      for(int i=0;i<4;i++)
29          res|=check(x+w[i][0],y+w[i][1]);
30      return res;
31  }
32  int main(){
33      freopen("or.in","r",stdin);
34      freopen("or.out","w",stdout);
35      int i,j,mx=0;
36      scanf("%d%d",&n,&m);
```

```
37        memset(Mp,1,sizeof(Mp));
38        for(i=1;i<=n;i++)
39            for(j=1;j<=m;j++){
40                Mp[i][j]=0;
41                scanf("%d",&d[i][j]);
42                mx=max(mx,d[i][j]);
43            }
44        p=log2(mx);
45        for(i=p;i>=0;i--){
46            cpy(mp,Mp);
47            add(i,Mp);
48            memset(vis,0,sizeof(vis));
49            if(check(1,1))
50                cpy(Mp,mp);
51            else
52                b[i]=1;
53        }
54        for(i=0;i<=p;i++)
55            if(b[i])
56                ans+=1<<i;
57        printf("%d\n",ans);
58        return 0;
59    }
```

D.control

二分答案

```
1    //Coded by dst
2    #include<algorithm>
3    #include<cstdio>
4    using namespace std;
5    typedef long long ll;
6    int n;
7    ll ans,max_f;
8    ll a[1005],f[1005],dis[1005],matrix[1005][1005];
9    int k[1005];
10   bool vis[1005];
11   ll prim(){
12       fill(vis,vis+n+1,0);
13       fill(dis,dis+n+1,ll(1e18));
14       int step=1,i,j;
15       ll res=0;
16       for(i=1;i<n;i++){//i:the i-th node-adding
17           vis[step]=1;
18           for(j=1;j<=n;j++)
19           if(!vis[j])
20               dis[j]=min(dis[j],matrix[step][j]);
21           step=0;
22           for(j=1;j<=n;j++)
23               if(!vis[j]&&dis[j]<dis[step])
24                   step=j;
25           res+=dis[step];
26       }
27       return res;
28   }
```

```cpp
bool judge(ll r){//r:ratio
    int i,j;
    for(i=1;i<=n;i++)
        for(j=1;j<=n;j++)
            matrix[i][j]=1e18;
    for(i=1;i<=n;i++)
        for(j=i+1;j<=n;j++)
            if(k[i]!=k[j])
                matrix[i][j]=matrix[j][i]=r*(a[i]^a[j])-(f[i]^f[j]);
    return prim()<=0;
}
ll solve(){
    ll l=0,r=(max_f<<1),mid,res=-1;
    while(l<=r){
        mid=(l+r)>>1;
        if(judge(mid))
            l=mid+1,res=mid;
        else
            r=mid-1;
    }
    return res;
}
int main(){
    freopen("control.in","r",stdin);
    freopen("control.out","w",stdout);
    int i,j;
    scanf("%d",&n);
    for(i=1;i<=n;i++){
        scanf("%lld%lld%d",&a[i],&f[i],&k[i]);
        max_f=max(max_f,f[i]);
    }
    ans=solve();
    if(ans!=-1)
        printf("%lld\n",ans);
    else
        printf("poor jlb!\n");
    return 0;
}
```

ptz神仙的牛顿迭代

```cpp
//This program is written by Bring.
#include<cstdio>
#include<cstring>
#include<algorithm>
#include<cmath>
using namespace std;
#define Rd(a) (a=read())
inline int read(){
    register int x;register char c(getchar());register bool k;
    while((c<'0'||c>'9')&&c^'-')if((c=getchar())==EOF)exit(0);
    if(c^'-')x=c&15,k=1;else x=0,k=0;
    while(c=getchar(),c>='0'&&c<='9')x=(x<<1)+(x<<3)+(c&15);
    return k?x:-x;
}
void wr(register int a){
    if(a<0)putchar('-'),a=-a;
```

```
17        if(a<=9)putchar(a|'0');
18        else wr(a/10),putchar((a%10)|'0');
19  }
20  #define Ps putchar(' ')
21  #define Pe putchar('\n')
22  #define Frn0(i,a,b) for(register int i(a);i<(b);++i)
23  #define Frn1(i,a,b) for(register int i(a);i<=(b);++i)
24  #define Frn_(i,a,b) for(register int i(a);i>=(b);--i)
25  #define Fre(a,i) for(register int i(hd[a]);i;i=nxt[i])
26  #define Mst(a,b) memset(a,b,sizeof(a))
27  #define INF signed(0x3f3f3f3f)
28  #define NINF signed(0xc3c3c3c3)
29  #define File(a) freopen(a".in","r",stdin),freopen(a".out","w",stdout)
30  #define N (1001)
31  #define Eps (1e-4)
32  #define E(i,j) T(f[i]^f[j],a[i]^a[j])
33  int n,a[N],f[N],k[N],fa[N],mu;
34  double ans(1),nw;
35  bool vs[N];
36  int fnd(int a){return fa[a]==a?a:fa[a]=fnd(fa[a]);}
37  inline double prim();
38  struct T{
39      double v,w;
40      inline T(double vv=0,double ww=0){v=vv,w=ww;}
41      inline bool operator<(T b)const{return v-w*ans<b.v-b.w*ans;}
42      inline T operator+=(T b){return{v+=b.v,w+=b.w};}
43  }d[N],s;
44  signed main(){
45      File("control");
46      Rd(n);
47      Frn1(i,1,n){
48          Rd(a[i]),Rd(f[i]),Rd(k[i]),fa[i]=i;
49          Frn0(j,1,i)if(k[i]!=k[j]&&fnd(i)!=fnd(j))fa[fa[i]]=fa[j];
50      }
51      fnd(1);
52      Frn1(i,2,n)if(fnd(i)!=fa[1])printf("poor jlb!"),exit(0);
53      while(fabs(prim()-ans)>Eps)ans=nw;
54      wr(ans),exit(0);
55  }
56  inline double prim(){
57      fill(d,d+n+1,T(-9999999999999)),Mst(vs,0),s={0,0},vs[1]=1;
58      Frn1(i,2,n)if(k[1]!=k[i])d[i]=E(1,i);
59      Frn0(p,1,n){
60          mu=0;
61          Frn1(i,2,n)if(!vs[i]&&d[mu]<d[i])mu=i;
62          vs[mu]=1,s+=d[mu];
63          Frn1(i,2,n)if(!vs[i]&&k[mu]!=k[i])d[i]=max(d[i],E(mu,i));
64      }
65      return nw=s.v/s.w;
66  }
```