

Олимпиада СПбГУ по информатике 2019/20 учебного года

A	B	C	D	E	F	Sum
100	100	100	40	100	0	440

Task A ()

```
a = (int(input()))
p = 0
for i in range(100):
    p = (p+a)//2
print(p)
```

Task B ()

```
def hyp(a,b):
    return (a**2+b**2)**0.5
com = int(input())
if com==6:
    xs = []
    ys = []
    for i in range(6):
        x ,y = map(float ,input().split())
        xs.append(x)
        ys.append(y)
    kek = 0
    lupa=0
    pupa=0
    for i in range(6):
        for k in range(6):
            t = hyp(xs[i]-xs[k],ys[i]-ys[k])
            if t>kek:
                kek =t
                lupa =i
                pupa = k
    print(xs[lupa],ys[lupa])
    print((xs[lupa]+xs[pupa])/2,(ys[lupa]+ys[pupa])/2)
    print(xs[pupa],ys[pupa])
if com==3:
    ax,ay = map(float ,input().split())
    cx, cy = map(float ,input().split())
    bx,by = map(float ,input().split())
    rx = ax-cx
    ry = ay-cy
    for i in range(6):
        print(cx+rx,cy+ry)
        ty = 3*0.5/2*rx+ry/2
        tx = rx/2-3*0.5/2*ry
        rx = tx
        ry = ty
```

Task C ()

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

#define int long long
#define inf 1000000000
#define endl "\n"

using namespace std;
string ass;
int ans(string kek){
    int anus = inf;
    for (int i =0;i<kek.length();i++){
        int p = i;
        int pos = 0;
        int otv = 0;
        while(pos < ass.length()){
            if (p < kek.length() && kek[p]==ass[pos]){
                pos++;
                p++;
            } else{
                pos++;
                otv++;
            }
        }
        anus = min(anus,otv);
    }
    return anus;
}

signed main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    cin>>ass;
    int lol;
    cin>>lol;
    int otv =0;
    for (int snus =0;snus<lol;snus++){
        string ch;
        cin>>ch;
        otv +=ans(ch);
    }
    cout<<otv;
    return 0;
}
```

Task D ()

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

#define int long long
#define inf 1000000000
#define MAXN 1001
// #define endl "\n"

using namespace std;
int dpA = inf;
int n,m;
int Ax,Ay,Bx,By;
int fx[MAXN][MAXN];
int fy[MAXN][MAXN];
int dp[MAXN][MAXN];
int flag =0;

int cost(int x,int y,int felx,int fely){
    if(x>n||x<1||y>m||y<1)
        return inf;
    else{
        if(x==Ax && y==Ay )
            return min(dp[x][y]+abs(felx+fx[x][y])+abs(fely+fy[x][y]), dpA+abs(felx)+abs(fely));
        else
            return min(dp[x][y]+abs(felx)+abs(fely), dp[x][y]+abs(felx+fx[x][y])+abs(fely+fy[x][y]));
    }
}

signed main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    cin>>n>>m;
    cin>>Ax>>Ay>>Bx>>By;
    for(int i =1;i<=n;i++)
        for(int j=1;j<=m;j++){
            int a,b;
            cin>>a>>b;
            dp[i][j] = inf;
            fx[i][j] = a;
            fy[i][j] = b;
        }
    dp[Ax][Ay] = 0;
    for(int a=0;a<30;a++){
        if(a%2==0){
            for(int i =1;i<=n;i++)
                for(int j=1;j<=m;j++){
                    int anus = inf;
                    anus = min(anus, cost(i+1,j,1,0));
                    anus = min(anus, cost(i+1,j+1,1,1));
                    anus = min(anus, cost(i,j+1,0,1));
                    anus = min(anus, cost(i-1,j+1,-1,1));
                    anus = min(anus, cost(i-1,j,-1,0));
                    anus = min(anus, cost(i-1,j-1,-1,-1));
                    anus = min(anus, cost(i,j-1,0,-1));
                    anus = min(anus, cost(i+1,j-1,1,-1));
                    if(i==Ax && j==Ay){
                        dpA = min(dpA, anus);
                    }
                    dp[i][j] = min(dp[i][j], anus);
                }
        }
        else{
            for(int i =n;i>0;i--)
                for(int j=m;j>0;j--){
                    int anus = inf;
                    anus = min(anus, cost(i+1,j,1,0));
                    anus = min(anus, cost(i+1,j+1,1,1));
                    anus = min(anus, cost(i,j+1,0,1));
```

```

        anus = min(anus , cost ( i -1 , j +1 , -1 , 1 ) ) ;
        anus = min(anus , cost ( i -1 , j , -1 , 0 ) ) ;
        anus = min(anus , cost ( i -1 , j -1 , -1 , -1 ) ) ;
        anus = min(anus , cost ( i , j -1 , 0 , -1 ) ) ;
        anus = min(anus , cost ( i +1 , j -1 , 1 , -1 ) ) ;
        if ( i==Ax && j==Ay) {
            dpA = min(dpA , anus ) ;
        }
        dp[ i ][ j ] = min( dp[ i ][ j ] , anus ) ;
    }
}
cout<<(dp[Bx][By]) ;
return 0;
}

```

Task E ()

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

#define int long long
#define inf 1000000000
// #define endl "\n"

using namespace std;
int n,m, B;
bool block[10000] = {};
int a,b;
int ctr =0;
void inter(int x,int y){
    ctr++;
    if(ctr%2==0){
        cout<<"?"<<a<<" "<<b<<" "<<x<<" "<<y<<endl;
        int kek, lol;
        cin>>kek>>lol;
        block[kek/n] = true;
    } else{
        a = x;
        b = y;
    }
}

signed main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    cin>>n>>m>>B;
    n+=m++;
    int Bx[B],By[B];
    for(int i=0;i<B;i++){
        cin>>Bx[i]>>By[i];
    }
    int proc = 1<<B;
    int pos = 0;
    int tar = proc;
    while(pos < B){
        int cotor = 0;
        for(int i =0;i<proc;i++){
            if(!block[i]){
                inter(i*n+Bx[pos],By[pos]);
                cotor++;
                if(cotor>=tar)
                    break;
            }
        }
        tar/=2;
        pos++;
    }
    for(int i =0;i<proc;i++){
        if(!block[i]){
            cout<<"! "<<(i*n+1)<<" 1"<<endl;
        }
    }
    return 0;
}
```

Task F ()