**复数四则运算**

设计复数库，实现基本的复数加减乘除运算。  
　　输入时只需分别键入实部和虚部，以空格分割，两个复数之间用运算符分隔；输出时按a+bi的格式在屏幕上打印结果。参加样例输入和样例输出。  
　　注意考虑特殊情况，无法计算时输出字符串"error"。

样例输入

2 4 \* -3 2

样例输出

-14-8i

样例输入

3 -2 + -1 3

样例输出

2+1i

C++代码：

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*Powered by Graphene Richards\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

//{

#define OUTPUT\_PRECISION "%.2f"

#define LF\_PRECISION 10

#define INT\_64\_MOD "%I64d"

#define UNSIGNED\_64\_MOD "%I64u"

#define CONTEST\_EXIST 1

#define CONTEST\_START\_HOUR 13

#define CONTEST\_START\_MIN 0

#define CONTEST\_DUR\_HOUR 4

#define CONTEST\_DUR\_MIN 0

//#pragma comment(linker,"/STACK:102400000,102400000")

#include<cmath>

#include<cstdio>

#include<cstdlib>

#include<cstring>

#include<algorithm>

#include<bitset>

#include<complex>

#include<vector>

#include<iomanip>

#include<iostream>

#include<list>

#include<map>

#include<queue>

#include<set>

#include<stack>

#include<string>

#include<typeinfo>

#define FAST\_RW ios\_base::sync\_with\_stdio(0),cin.tie(0);

#define IT(x) \_\_typeof((x).begin())

#define FS(i,a) for(ll i=0;a[i];i++)

#define FE(x,ctn) for(IT(ctn)x=(ctn).begin(),CluhxSchFuDeugk=(ctn).end();x!=CluhxSchFuDeugk;x++)

#define FR(i,en) for(ll i=0,pJNwFPtlXiwFoIv=(en);i<pJNwFPtlXiwFoIv;i++)

#define FOR(i,en) for(ll i=1,SbKCIcakJTeYVqs=(en);i<=SbKCIcakJTeYVqs;i++)

#define FFR(i,x,y) for(ll i=(x),alVDbhLBoMEGSwA=(y);i<=alVDbhLBoMEGSwA;i++)

#define DFFR(i,x,y) for(ll i=(x),NWYfecAcmGBMJuU=(y);i>=NWYfecAcmGBMJuU;i--)

#define ll long long

#define ull unsigned long long

#define lf long double

#define pc putchar

#define mp make\_pair

#define pb push\_back

#define pq priority\_queue

#define fi first

#define se second

#define pii pair<int,int>

#define pdd pair<double,double>

#define lb(x) (x&(-x))

#define sqr(x) (x)\*(x)

#define all(x) (x).begin(),(x).end()

#define clr(x) memset((x),0,sizeof(x))

#define ms(x,v) memset((x),(v),sizeof(x))

#define NL puts("");

using namespace std;

template<class T1,class T2,class T3>

bool \_IN(T1 x,T2 y,T3 z){

return x<=y&&x>=z||x<=z&&x>=y;

}

ull gcd(ull a,ull b){

if(!b)return a;

while(b^=a^=b^=a%=b);

return a;

}

#ifdef wmx16835

#include<ctime>

#include<conio.h>

#include<windows.h>

#define GREEN 10

#define BLUE 11

#define RED 12

#define PINK 13

#define YELLOW 14

#define WHITE 15

struct TM{

int t;

TM(int a,int b,int c):t(a\*3600+b\*60+c){}

TM(int x):t(x){}

TM(){}

operator int(){return t;}

void print(){

printf("%02d:%02d:%02d",t/3600%24,t/60%60,t%60);

}

};

void OVZmetNNpAqAVZx(){

time\_t t=time(0);

srand(t);

tm\*p=localtime(&t);

TM day(24,0,0),cur(p->tm\_hour,p->tm\_min,p->tm\_sec),beg(CONTEST\_START\_HOUR,CONTEST\_START\_MIN,0),len(CONTEST\_DUR\_HOUR,CONTEST\_DUR\_MIN,0),en(beg+len),fen(beg+en+day>>1),seg;

if(beg>cur)cur.t+=day;

puts(" +--------------------------+");

if(\_IN(cur,beg,en)&&CONTEST\_EXIST){

puts(" | Status: Running |");

printf(" | Progress: %5.1f %% |\n",(double)(cur-beg)/len\*100);

seg.t=en-cur;

printf(" | Remaining time: ");

seg.print();

puts(" |");

}

else{

printf(" | Current time: ");

cur.print();

puts(" | ");

if(cur<=fen||!CONTEST\_EXIST)

puts(" | Status: Ended |");

else{

puts(" | Status: Scheduled |");

cur.t-=day;

seg.t=beg-cur;

printf(" | Remaining time: ");

seg.print();

puts(" |");

}

}

puts(" +--------------------------+");

puts("................................\n");

}

const HANDLE hout=GetStdHandle(STD\_OUTPUT\_HANDLE);

void \_COLOR(unsigned x=BLUE){

SetConsoleTextAttribute(hout,x);

}

void pCJUYxWEXKaDOIC(){

int num=1;

FILE\*p=fopen("FILE\_NAME","r");

if(p){

fscanf(p,"%d",&num);

fclose(p);

}

char f\_name[1024];

sprintf(f\_name,"%d.out",num++);

\_COLOR(PINK);

printf("[NOTICE] Standard output has been redirected to \"%s\".\n",f\_name);

\_COLOR();

freopen(f\_name,"w",stdout);

if(!stdout)

exit(1);

else

p=fopen("FILE\_NAME","w");

if(p){

fprintf(p,"%d",num);

fclose(p);

}

}

int bXMXqqguPAUDCia;

void FrKZgXsfpPVkeNv(){

char x[1000];

sprintf(x,"[Paused: %d]",++bXMXqqguPAUDCia);

int len=strlen(x);

printf(x);

getch();

FR(i,len)pc('\b');

FR(i,len)pc(' ');

FR(i,len)pc('\b');

}

#define LOG {\_COLOR(RED);unsigned ijqQjAZZNYpJYBe=clock();puts("\n----------------------");\_COLOR();

#define TEL \_COLOR(RED),printf("\n----------------------\nExecution time: %ums\n----------------------\n",clock()-ijqQjAZZNYpJYBe);\_COLOR();}

#define SHOW\_TIME {\_COLOR(GREEN);OVZmetNNpAqAVZx();\_COLOR();}

#define test(...) \_COLOR(YELLOW),printf(\_\_VA\_ARGS\_\_),\_COLOR()

#define TEST(x) \_COLOR(YELLOW),printf("%s = ",#x),\_P(x),puts(""),\_COLOR()

#define TRY(...) {\_\_VA\_ARGS\_\_}

#define PF pCJUYxWEXKaDOIC();

#define PP {\_COLOR(RED);FrKZgXsfpPVkeNv();\_COLOR();}

#else

int ebtpqJsBCnTgggi;

#define LOG {

#define TEL }

#define SHOW\_TIME

#define test(...) ebtpqJsBCnTgggi

#define TEST(...) ebtpqJsBCnTgggi

#define TRY(...)

#define PF

#define PP ;

#endif

int S(char\*a){

return scanf("%s",a)==1;

}

template<class T>

int S(T&a){

const char\*x=typeid(a).name();

if(!strcmp(x,"i")||!strcmp(x,"b"))return scanf("%d",&a)==1;

else if(!strcmp(x,"j"))return scanf("%u",&a)==1;

else if(!strcmp(x,"c"))return scanf("%c",&a)==1;

else if(!strcmp(x,"Pc")||\*x=='A')return scanf("%s",a)==1;

else if(!strcmp(x,"f"))return scanf("%f",&a)==1;

else if(!strcmp(x,"d"))return scanf("%lf",&a)==1;

else if(!strcmp(x,"x"))return scanf(INT\_64\_MOD,&a)==1;

else if(!strcmp(x,"y"))return scanf(UNSIGNED\_64\_MOD,&a)==1;

else if(!strcmp(x,"e"))return (cin>>a)!=0;

else test("Input format error!\n");

}

template<class T>

void \_P(T a){

const char\*x=typeid(a).name();

if(!strcmp(x,"i")||!strcmp(x,"b"))printf("%d",a);

else if(!strcmp(x,"j"))printf("%u",a);

else if(!strcmp(x,"c"))printf("%c",a);

else if(!strcmp(x,"Pc")||!strcmp(x,"PKc")||\*x=='A')printf("%s",a);

else if(!strcmp(x,"d")||!strcmp(x,"f"))printf(OUTPUT\_PRECISION,a);

else if(!strcmp(x,"x"))printf(INT\_64\_MOD,a);

else if(!strcmp(x,"y"))printf(UNSIGNED\_64\_MOD,a);

else if(!strcmp(x,"e"))cout<<setprecision(LF\_PRECISION)<<a;

else test("Output format error!\n");

}

template<class T1,class T2>

int S(T1&a,T2&b){

return S(a)+S(b)==2;

}

template<class T1,class T2,class T3>

int S(T1&a,T2&b,T3&c){

return S(a)+S(b)+S(c)==3;

}

template<class T1,class T2,class T3,class T4>

int S(T1&a,T2&b,T3&c,T4&d){

return S(a)+S(b)+S(c)+S(d)==4;

}

template<class T1,class T2,class T3,class T4,class T5>

int S(T1&a,T2&b,T3&c,T4&d,T5&e){

return S(a)+S(b)+S(c)+S(d)+S(e)==5;

}

template<class T>

void P(T a){

\_P(a);

pc(' ');

}

template<class T1,class T2>

void P(T1 a,T2 b){

\_P(a);pc(' ');

\_P(b);pc(' ');

}

template<class T>

void PN(T a){

\_P(a);

NL

}

template<class T1,class T2>

void PN(T1 a,T2 b){

\_P(a);pc(' ');

\_P(b);NL

}

template<class T1,class T2,class T3>

void PN(T1 a,T2 b,T3 c){

\_P(a);pc(' ');

\_P(b);pc(' ');

\_P(c);NL

}

template<class T1,class T2,class T3,class T4>

void PN(T1 a,T2 b,T3 c,T4 d){

\_P(a);pc(' ');

\_P(b);pc(' ');

\_P(c);pc(' ');

\_P(d);NL

}

template<class T1,class T2,class T3,class T4,class T5>

void PN(T1 a,T2 b,T3 c,T4 d,T5 e){

\_P(a);pc(' ');

\_P(b);pc(' ');

\_P(c);pc(' ');

\_P(d);pc(' ');

\_P(e);NL

}

template<class T>

void PA(T\*a,int n){

FR(i,n-1)P(a[i]);

PN(a[n-1]);

}

template<class T>

void PA(const T&x){

IT(x) ita=x.begin();

FE(it,x){

\_P(\*it);

if(++ita==x.end())NL

else pc(' ');

}

}

int kase;

const double pi=4\*atan(1);

const double ep=1e-9;

//}

struct cp{

double s,x;

bool v;

void in(){

S(s,x);

v=1;

}

cp operator+(const cp&r){

return {s+r.s,x+r.x,1};

}

cp operator-(const cp&r){

return {s-r.s,x-r.x,1};

}

cp operator\*(const cp&r){

return {s\*r.s-x\*r.x,s\*r.x+x\*r.s,1};

}

cp operator/(const cp&r){

if(r.s==0&&r.x==0)return {0,0,0};

return {(s\*r.s+x\*r.x)/(sqr(r.s)+sqr(r.x)),(-s\*r.x+x\*r.s)/(sqr(r.s)+sqr(r.x)),1};

}

void out(){

if(v)

cout<<s<<(x<0?'-':'+')<<abs(x)<<'i';

else

puts("error");

}

};

char bf[5];

int main(){

SHOW\_TIME

cp a,b;

a.in();

S(bf);

b.in();

if(\*bf=='+')a=a+b;

if(\*bf=='-')a=a-b;

if(\*bf=='\*')a=a\*b;

if(\*bf=='/')a=a/b;

a.out();

}

/\*\*\*\*\*\*\*\*\*Risoft corporation all rights reserved\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*Template V1.40 build 20150122\*\*\*\*\*\*\*\*\*\*\*\*\*/

C代码：

#include<stdio.h>

int main()

{

double a,b,c,d;

double bb=0.0;

char op;

scanf("%lf %lf %c %lf %lf",&a,&b,&op,&c,&d);

bb=c\*c+d\*d;

switch(op)

{

case 43:printf("%.0lf%+.0lfi\n",a+c,b+d);break;

case 45:printf("%.0lf%+.0lfi\n",a-c,b-d);break;

case 42:printf("%.0lf%+.0lfi\n",a\*c-b\*d,a\*d+b\*c);break;

case 47:{

if(bb!=0.0)

if((a\*c+b\*d)/bb<0&&(a\*c+b\*d)/bb>-1)

printf("%.1lf%+.1lfi\n",(a\*c+b\*d)/bb,(b\*c-a\*d)/bb);

else printf("%.0lf%+.0lfi\n",(a\*c+b\*d)/bb,(b\*c-a\*d)/bb);

else printf("error");

}

break;

}

return 0;

}

JAVA代码：

import java.util.Scanner;

public class Main{

/\*\*

\* @author linfan

\*/

public static void main(String[] args) {

Scanner sc=new Scanner(System.in);

String[] ss=sc.nextLine().split(" ");

int a=Integer.parseInt(ss[0]);

int b=Integer.parseInt(ss[1]);

int c=Integer.parseInt(ss[3]);

int d=Integer.parseInt(ss[4]);

char ch=ss[2].charAt(0);

int p,q;

String s="";

switch(ch){

case '+': p=a+c;q=b+d;

if(p!=0)s+=p;

if(q>0) s+="+"+q+"i";

if(q<0) s+=q+"i";

break;

case '-': p=a-c;q=b-d;

if(p!=0)s+=p;

if(q>0) s+="+"+q+"i";

if(q<0) s+=q+"i";

break;

case '\*': p=a\*c-b\*d;q=b\*c+a\*d;

if(p!=0)s+=p;

if(q>0) s+="+"+q+"i";

if(q<0) s+=q+"i";

break;

case '/': int m=c\*c+d\*d;

if(m==0){

s="error";break;

}

double p1=(a\*c+b\*d)\*1.0/m;

double q1=(b\*c-a\*d)\*1.0/m;

if(p1!=0){

if((a\*c+b\*d)%m==0)s+=(int)p1;

else s+=p1;

}

if(q1>0){

if((b\*c-a\*d)%m==0)s+="+"+(int)q1+"i";

else s+="+"+q1+"i";

}

if(q1<0){

if((b\*c-a\*d)%m==0)s+=(int)q1+"i";

else s+=q1+"i";

}

break;

default:break;

}

System.out.println(s);

}

}