#include<iostream>

#include<cmath>

using namespace std;

class Vector3d

{

double x,y,z;

public:

Vector3d()

{

x=3;

y=4;

z=5;

}

Vector3d(int p,int q,int r)

{

x=p;

y=q;

z=r;

}

double getXcom()

{

return x;

}

void setXcom(double a)

{

x=a;

}

double getYcom()

{

return y;

}

void setYcom(double a)

{

y=a;

}

double getZcom()

{

return z;

}

void setZcom(double a)

{

z=a;

}

double magnitude(Vector3d v)

{

double d;

d=sqrt((v.x\*v.x)+(v.y\*v.y)+(v.z\*v.z));

return d;

}

double dot(Vector3d u,Vector3d v)

{

double d;

d=(u.x\*v.x)+(u.y\*v.y)+(u.z\*v.z);

return d;

}

Vector3d cross(Vector3d u,Vector3d v)

{

Vector3d c;

c.x=u.y\*v.z-u.z\*v.y;

c.y=u.z\*v.x-u.x\*v.z;

c.z=u.x\*v.y-u.y\*v.x;

return c;

}

};

int main()

{

int i;

Vector3d v1,v2,v3;

Vector3d v[5]={Vector3d(0,0,0),Vector3d(0,0,0),Vector3d(0,0,0),Vector3d(0,0,0),Vector3d(0,0,0)};

cout<<"The five array initialisation zero vectors are-"<<endl;

for(i=0;i<5;i++)

{

cout<<"("<<v[i].getXcom()<<","<<v[i].getYcom()<<","<<v[i].getZcom()<<")"<<endl;

}

int a,b,c;

double d;

cout<<"enter 1st vector element\n";

cin>>a>>b>>c;

v1.setXcom(a);

v1.setYcom(b);

v1.setZcom(c);

cout<<"enter 2nd vector element\n";

cin>>a>>b>>c;

v2.setXcom(a);

v2.setYcom(b);

v2.setZcom(c);

d=v3.magnitude(v1);

cout<<"first vector magnitude is "<<d<<endl;

d=v3.magnitude(v2);

cout<<"second vector magnitude is "<<d<<endl;

d=v3.dot(v1,v2);

cout<<"dot product of vector is "<<d<<endl;

v3=v3.cross(v1,v2);

cout<<"cross product is (" <<v3.getXcom()<<","<<v3.getYcom()<<","<<v3.getZcom()<<")"<<endl;

Vector3d v4;

cout<<"the initialized constructor vector is "<<v4.getXcom()<<","<<v4.getYcom()<<","<<v4.getZcom()<<endl;

return 0;

}