I-Three Spheres and a Tetrahedron

Given a tetrahedron **OABC** with vertices **O**, **A**, **B** and **C**.

There is a sphere, **S1** (red, center **Q1**), inscribed in the tetrahedron tangent to the inside of each face **OAB** (gray), **OAC** (brown), **OBC** (magenta) and **ABC** (cyan and black).

There is a second sphere, **S2** (green, center **Q2**), tangent to the (extended) inside of **OAB**, **OAC** and **OBC**) and to the outside of **ABC**. (There is actually such a sphere for each face, tangent to the outside of the face and the inside of the other extended faces).

There is a third larger sphere, **S3** (blue, center **Q3**), which passes thru vertices **A**, **B** and **C** and is tangent to each of **S1** and **S2** so the outside of the smaller spheres is tangent to the inside of the largest sphere (see Figure 1, below, for two different views. Tetrahedron ABC is cyan in the first picture and black in the second one for clarity):

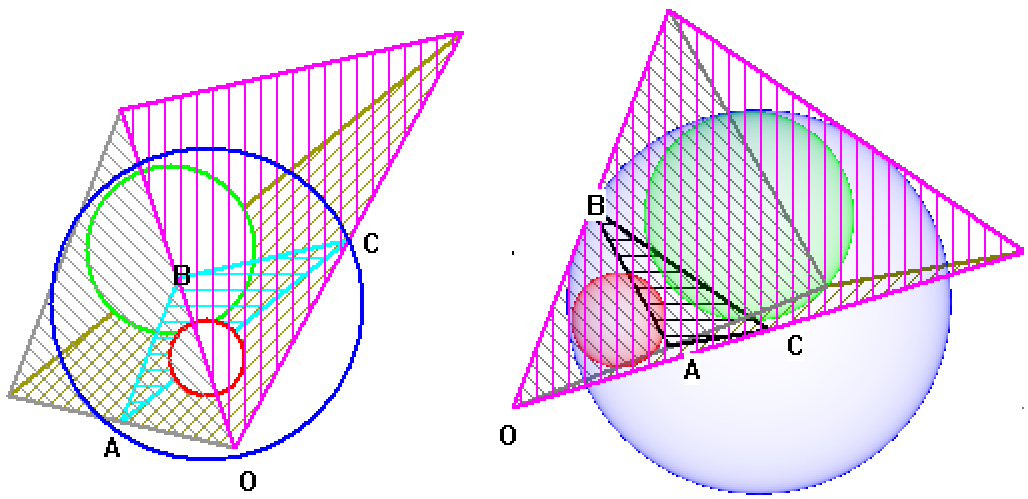

Figure 1

The following figures give several views of the tetrahedron and spheres.

Figure 2 shows the view along **OA,** which shows the two smaller spheres tangent to **OAB** and **OAC** (left). The view along **BC** shows the two smaller spheres tangent to **OBC** and tangent on opposite sides of **ABC** (right):

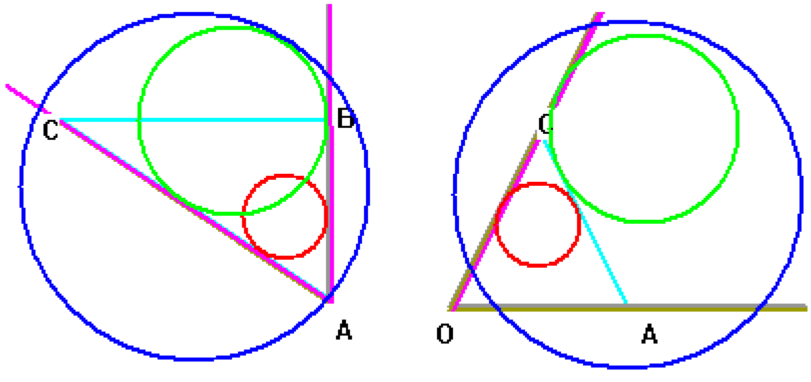

Figure 2

Figure 3 shows **S3** passing through **A**, **B** and **C** and tangent to **S1** and *S2*. On the left, the view perpendicular to the plane of triangle **A**,**B**,**Q3** shows **S3** passing through **A** and **B**. In the center, the view perpendicular to the plane of triangle **A**,**C**,**Q3** shows **S3** passing through **A** and **C**. On the right, the view perpendicular to the plane of triangle **Q1**,**Q2**,**Q3** (the centers of the three spheres) shows **S1** and **S2** tangent to the inside of **S3**.

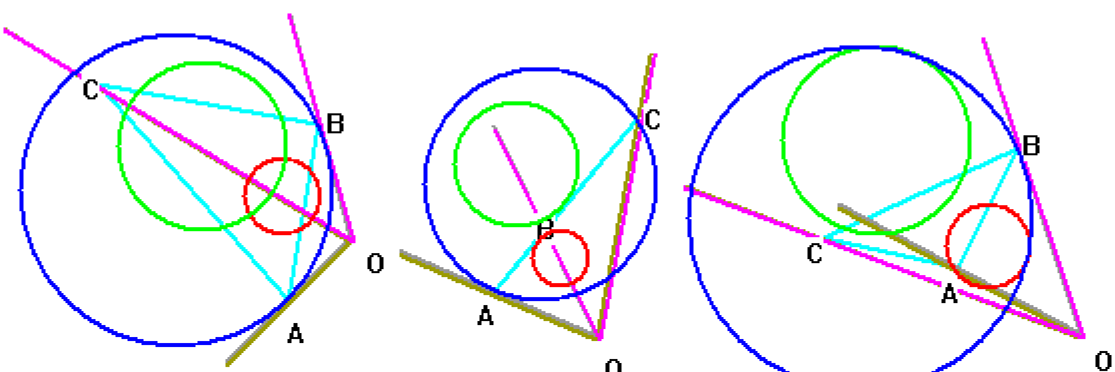

Figure 3

Write a program which takes as input the vertices **O**, **A**, **B** and **C** and computes the center and radius of the big sphere (which entails finding the other two spheres).

O will be the origin (0,0,0). **A** will lie on the positive *x* -axis (**Ax**,0,0), **B** will be on the *xy*-plane (**Bx**,**By**,0) and **C** will be in the first orthant (**Cx**,**Cy**,**Cz**). **Ax**, **By** and **Cz** will be strictly positive and the remaining values will be non-negative.

Input

The input consists of a single line containing six double precision decimal values **Ax**, **Bx**, **By**, **Cx**, **Cy** and **Cz** in that order (as described above), (0 < **Ax**, **By**, **Cz** <= 10) and (0 <= **Bx**, **Cx**, **Cy** <= 10).

Output

The single line of output contains four decimal values to four decimal places: **center_x**, **center_y**, **center_z** and **radius** of the big sphere.

Sample Input	Sample Output
`2 3 2 3 1 4`	`2.8563 0.8218 1.8305 2.1816`

Sample Input	Sample Output
`1 0 2 0 0 3`	`1.0000 1.2500 1.6667 2.0833`