#include <iostream>

#include <cmath>

int main() {

float Xo = 0, Yo = 0, Zo = 0, X1, X2, X3, a1, a2, a3, a4, b1, b2, b3, b4, c1, c2, c3, c4, A, B, C;

int count = 0;

std::cout << "Enter the values of a1, a2, a3, a4: ";

std::cin >> a1 >> a2 >> a3 >> a4;

std::cout << "Enter the values of b1, b2, b3, b4: ";

std::cin >> b1 >> b2 >> b3 >> b4;

std::cout << "Enter the values of c1, c2, c3, c4: ";

std::cin >> c1 >> c2 >> c3 >> c4;

if ((std::fabs(a1) >= std::fabs(a2 + a3)) && (std::fabs(b2) >= std::fabs(b1 + b3)) && (std::fabs(c3) >= std::fabs(c1 + c2))) {

jacobi:

X1 = (a4 - ((a2 \* Yo) + (a3 \* Zo))) / a1;

X2 = (b4 - ((b1 \* Xo) + (b3 \* Zo))) / b2;

X3 = (c4 - ((c1 \* Xo) + (c2 \* Yo))) / c3;

} else {

std::cout << "Enter the correct values\n";

return 1; // Exit the program if incorrect values are entered

}

A = std::fabs((X1 - Xo) / Xo);

B = std::fabs((X2 - Yo) / Yo);

C = std::fabs((X3 - Zo) / Zo);

if ((A <= 0.001) && (B <= 0.001) && (C <= 0.001)) {

std::cout << "The values of X1=" << X1 << ", X2=" << X2 << ", X3=" << X3 << "\n";

} else {

Xo = X1;

Yo = X2;

Zo = X3;

count++;

goto jacobi;

}

std::cout << "The number of iterations is " << count << "\n";

return 0;

}