#include<iostream>

#include<cmath>

using namespace std;

double computeBond(double F, double c, double y, int t) {

//compute Bond

double B = 0;

double temp = (1 + (0.01\*y/2));

for(int i=1; i<t; i++) {

B = B + ((c/2)/(pow(temp,i)));

}

B = B + ((F+(c/2))/(pow(temp,t)));

return B;

}

int main() {

double F = 0;

double c = 0;

int t = 3;

cout << "Please input the F of the bond : ";

cin >> F;

//in midterm 1 F will be 100

cout << "Please input the c of the bond : ";

cin >> c;

//in midterm 1 c will be 4

cout << endl;

for(int i=0; i<10; i++) {

double Btemp = computeBond(F, c, i, t);

cout << "y(%) = " << i << ", B = " << Btemp << endl;

}

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

double BM = 0 ;

int yMid = 0;

cout << endl <<"Please input the B-market : ";

cin >> BM;

double yMin = 0;

int yMax = 9;

while(true) {

yMid = (yMin+yMax) / 2;

double B\_Mid = computeBond(F, c, yMid, t);

if( (BM == B\_Mid) || (yMid-yMin<=1 && yMax-yMid<=1 && yMax-yMin == 1)) {

//the while loop will stop, if

//1. find the same Bond value

//2. the distance from y-Min to y-low & y-high is smaller than 1

cout << "y-low : " << yMin << endl;

cout << "y-high : " << yMax << endl;

cout << "y-mid : " << (yMin+yMax)/2 << endl;

cout << "B-mid : " << computeBond(F, c, (yMin+yMax)/2, t) << endl;

break;

}

else if(BM < B\_Mid) yMin = yMid;

else yMax = yMid;

}

cout << "In Question 5, B3.25 : " << computeBond(F, c, 3.25, t) << endl;

return 0;

}