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//File: invest.cpp
//Created by: Tan Qi Hao
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/*
Synopsis:
This program calculate the final value of the investment compounded
annually and the investment continuously compounded. The program also
shows the profit for both types of investment and their profit difference.
*/

#include <iostream>
#include <cmath>
using namespace std;

int main()
{
    int x;          //initial investment(dollars)
    int R;          //interest rate per year(percentage)
    int Q;          //number of quarters

    cout << "Enter initial investment (dollars): " ;
    cin >> x;
    cout << "Enter interest rate per year (percentage): " ;
    cin >> R;
    cout << "Enter number of quarters: " ;
    cin >> Q;

    double Y; //numbers of years
    double D; //Final value of the investment
    double P; //The profit (dollars)

    Y = static_cast<double>(Q) / 4;

    D = x * pow(1 + static_cast<double>(R) / 100 , Y);
    cout << "Value of your investment compounded yearly after " << Y << "
year(s) is " << D << " dollars." << endl;

    P = D - x;
    cout << "Profit from your investment after " << Y << " year(s) is " << P
<< " dollars." << endl;
    cout << endl;

    double DC ; //final value of the investment continuously compounded
    double PC ; //The profit of the investment continuously compounded
    double F ; //difference of the profits between both investment types

    DC = x * pow(2.71828 , (static_cast<double>(R) / 100) * Y);
    cout << "Value of your same investment but continuously compounded is "
<< DC << " dollars." << endl;

    PC = DC - x;
    cout << "Profit from this investment is " << PC << " dollars." << endl;
    cout << endl;

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F = abs(P - PC);  
cout << "The difference between both investment types is " << F << "  
dollars." << endl;  
  
return 0;  
}
```