```cpp
#include <iostream>
#include <cmath>
#include <ctime>
using namespace std;

int main ()

{

        double D, sum2, p, vol, dvol, ru, nh, nt, x[10];
        int m, n, trials, i;
        clock_t start, end;
        double t;

        //p stands for "probability"
        //dpi is the uncertainty of pi
        //ru stands for "relative uncertainty"

        srand((unsigned int)time(NULL));
        cout << "Dimensions:";
        cin >> D;

        cout << "Number of throws: ";
        cin >> nt ;

        cout << "Number of trials: ";
        cin >> trials;


        for(m=1; m<=trials; m++)

        {
                nh=0;
                start=clock();
                for(n=1; n<=nt; n++)

                {   sum2= 0;
                     for(i=1; i<=D; i++){
                            x[i] = (double) rand()/RAND_MAX;

                             sum2= sum2 + x[i]*x[i];
                             }
                                if(sum2 <= 1)
                                nh++;
                }
                end=clock();
        t=(double)(end-start)/CLOCKS_PER_SEC;
        p = nh/nt;
        vol = pow(2,D)*p;
        dvol = pow(2,D)*sqrt(nt*p*(1-p))/nt;
        ru = dvol/vol;
        //V_sp = pow(2,D)*p;
        cout << "TRIAL=" << m << "\ttime=" << t <<endl;
        cout << "nh = " << nh << "\tvol=" << vol << "\tp = " << p << "\tdvol = " <<
        dvol << "\tru = " << ru << endl;
        }
}
```