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#include<bits/stdc++.h>
#include <math.h>
using namespace std;

int degree, eq[100], j = 0;
double e, x[100];

double horner(double x)
{
   double p;
   p = eq[0];
   for(int i = 1; i <=degree; i++){
      p = p*x +eq[i];
   }
   return p;
}
double secant(){
   double fx1, fx2, fx, x1, x2;
   int i = 2;
   x1 = x[0];//x(i-1)
   x2 = x[1];//x(i)
   fx1 = horner(x1);
   fx2 = horner(x2);
   cout<<"\nIteration    Xi-1          Xi            Xi+1      f(i-1)       f(i)          f(root)";
   while(1){
      j++;
      x[i] = x2 -((fx2*(x2-x1))/(fx2-fx1));
      fx = horner(x[i]);//x(i+1)
      printf("\n %d         %lf      %lf      %lf      %lf      %lf      %lf", j, x1, x2, x[i], fx1, fx2, fx);
```

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        if(fx == 0){
            return x[i];
        }
        else{
            i++;
            x2 = x[i-1];
            x1 = x[i-2];
            fx2 = horner(x2);
            fx1 = horner(x1);
        }
        if(fabs(fx)<e)
        {
            return x2;
        }
    }
}
int main(){
    double root;
    cout<<"ENTER THE TOTAL NO. OF POWER: ";
    cin>>degree;
    cout<<"\n";
    for(int i = 0; i <=degree; i++){
        cout<<"x^"<<i<<"::";
        cin>>eq[i];
        cout<<endl;
    }
    cout<<"THE POLYNOMIAL IS ::: "<<eq[0]<<"x^2"<<eq[1]<<"x"<<eq[2]<<endl;
    cout<<"INTIAL X0----> ";
    cin>>x[0];
```

```
    cout<<"X1----> ";
    cin>>x[1];

    printf("Enter the value of error: ");
    cin>>e;
    root = secant();
    cout<<endl;
    cout<<"Approximate Root using secant: "<<root<<endl;
    return 0;
}
```