```c
/*
Finding the real roots of any given equation using cheybesev method

Chebysav method is like approimating the given Transcedental Equation into a quadratic equa
tion f(x) = 0, f(x) ~ a0 + a1x + a2x^2

Let xk be an approximate root
f'(x) = a1 + a2x
f''(x) = 2a2  by subsituting the value xk in all the equations we get the values of f(xk),
f'(xk), f''(xk)

we get,
     f(x) ~ fk + (x-xk)f'_k + (x-xk)^2*f''_k/2 ==> 0
     x_(k+1) = xk - fk/f'k - (fk^2 f''_k)/2((f'_k)^3)
*/

#include <stdio.h>
#include <stdlib.h>
#include <math.h>

//Function prototypes
float f(float x);
float df(float x);
float ddf(float x);
float chebyshev(float guess);

//Global variables
float a, b, c;

int main(int argc, char **argv)
{
   float disc, root, guess;

   if (argc != 5)
   {
      fprintf(stderr, "Usage: %s <x^2 coeff> <x coeff> <const> <guess>\n", argv[0]);
      exit(1);
   }

   a = atof(argv[1]);  //Taking a, b, c as inputs from the user
   b = atof(argv[2]);
   c = atof(argv[3]);

   disc = ((b * b) - (4 * a * c)); //Value of discremenet

 // Checking whether discriminant < zero
   if (disc < 0)
   {
      fprintf(stderr, "The given Equation has no real roots.\n");
      exit(2);
   }

   guess = atof(argv[4]);

   root = chebyshev(guess); //Invoking Function
   printf("Root of the equation is: %f\n", root);

   exit(0);
}

float chebyshev(float guess)
{
   float root, a;
   a = guess;

   //Loop infinitely
   while (1)
   {
```

```c
        root = a - (f(a)/df(a)) - (f(a)*f(a)*ddf(a))/(2*df(a)*df(a)*df(a));
        //root = a - (fa/fa_d) - (fa*fa*fa_d_d)/(2*fa_d*fa_d*fa_d);

        //Checking the convergence of the equation
        if (floor(a*10000) == floor(root*10000))
        {
           return root;
        }
        a = root;
    }
    return root;
}

float f(float x)
{
    float ans;  //Declaration of variables in float

    ans = (a * x * x) + (b * x) + (c);  // f(x)
    if(ans != ans)
    {
        printf("Cannot proceed further..Try changing the guess\n");
        exit (3);
    }
    return ans;  //Returning the value of f(x) at x1
}

float df(float x)
{
    float ans;  //Declaration of variables in float

    ans = 2 * a * x + b;  // f'(x)
    if(ans != ans)
    {
        printf("Cannot proceed further..Try changing the guess\n");
        exit (4);
    }
    return ans;  //Returning the value of f'(x) at x1
}

float ddf(float x)
{
    float ans;  //Declaration of variables in float

    ans = 2 * a ;  // f''(x)
    if(ans != ans)
    {
        printf("Cannot proceed further..Try changing the guess\n");
        exit (4);
    }
    return ans;  //Returning the value of f'(x) at x1
}
```