International Journal of Scientific Engineering and Applied Science (IJSEAS) – Volume-2, Issue-3, March 2016
ISSN: 2395-3470
www.ijseas.com

Computer Tool for Theorem to Find the Real Roots of a Nonlinear Function , Algebraic and Transcendental Equations By Newton-Raphson Method

P P Kolhe , P.R. Kolhe,
Assistant professor Dr. PDKV ,Akola

Abstract:-

In mathematical theorem to solve iterative implementation of the Intermediate Value Theorem to find the real roots of a nonlinear function. Manually it is very difficult task to get the required output number of iteration need to perform. In the era of Information Communication Technology (ICT) .The ICT programming technique, it is easier task. This paper discusses ICT programming technique for Newton-Raphson method, also known as the Newton's Method, is the simplest and fastest approach to find the root of a function. It is an open bracket method and requires only one initial guess. The **C program for Newton Raphson method** presented here is a programming approach which can be used to find the real roots of not only a nonlinear function, but also those of algebraic and transcendental equations.

Newton-Raphson method using C language Version 3.0V Turbo C++ copyright (c) 1990, 1992 by Borland International was developed.

Key word: - ICT , nonlinear ,theorem , Turbo C++ .iteration

Introduction:

In mathematical theorem to solve iterative implementation of the Intermediate Value Theorem to find the real roots of a nonlinear function. Manually it is very difficult task to get the required output number of iteration need to perform. In the era of Information Communication Technology (ICT). The computer programming technique it is easier task. Computer programming for Iterative

Implementation of the Intermediate Value Theorem to Find the Real Roots of a Nonlinear Function , Algebraic and Transcendental Equations By Newton-Raphson Method Newton-Raphson method, also known as the Newton's Method, is the simplest and fastest approach to find the root of a function. It is an open bracket method and requires only one initial guess. The **C program for Newton Raphson method** presented here is a programming approach which can be used to find the real roots of not only a nonlinear function, but also those of algebraic and transcendental equations.

Newton's method is often used to improve the result or value of the root obtained from other methods. This method is more useful when the first derivative of f(x) is a large value.

The programming effort for **Newton Raphson Method in C** language is relatively simple and fast.

Configuration of the System

Desktop System with any configuration where at least 'C' compiler install.

(Intel® Pentium® 4, 2.0 GHz, 1 GB DDR 2-RAM, Intel 845 Series Motherboard , Nvidia Geforce 4® – 440-8x AGP card , Microsoft® Windows™ XP Professional Version 2002 Service Pack 2)

About the platform

The programming effort for **Newton Raphson Method in C** language using C language Version 3.0 Turbo c++ copyright (c)1990, 1992 by Borland International, Inc.

Computer programming approach

Using C program for **Newton Raphson Method in C** is one of the simplest computer programming approaches to find the solution of nonlinear equations. It requires two initial guesses and is a closed bracket method.

The programming effort for **Newton Raphson Method in C** language is simple and easy. The convergence is linear, slow but steady. The overall accuracy obtained is very good

Features of Newton Raphson Method:

- Type – open bracket
- No. of initial guesses – 1

- Convergence – quadratic
- Rate of convergence – faster
- Accuracy – good
- Programming effort – easy
- Approach – Taylor's series

Below is a very short and simple source code in **C program for Newton's method** to find the root of ***x*log10(x) – 1.2.***

Variables:

- itr – a counter which keeps track of the no. of iterations performed
- maxmitr – maximum number of iterations to be performed
- df(x) – the derivative of f(x) with respect to x
- x0 – the value of root at nth iteration
- x1 – the value of root at (n+1)th iteration
- allerr – allowed error

Example for equation---

f(x) = x*log10(x) – 1.2

Source Code for Newton Raphson

Method in C:

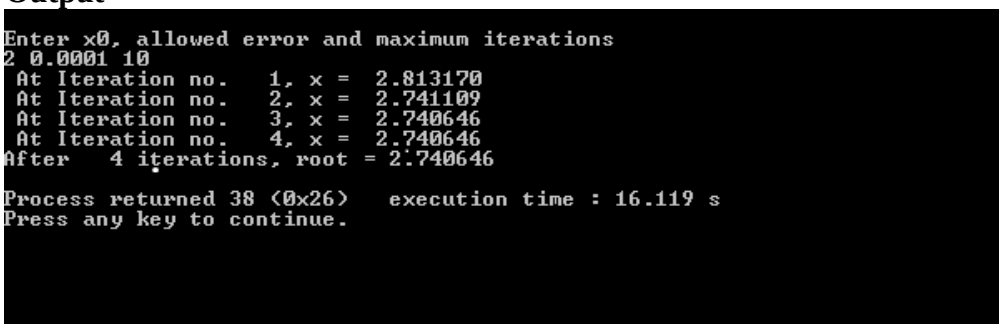
```
#include<stdio.h>
#include<math.h>
float f(float x)
{
   return x*log10(x) - 1.2;
}
float df (float x)
{
   return log10(x) + 0.43429;
}
void main()
{    int itr, maxmitr;
   float h, x0, x1, allerr;
   printf("\nEnter x0, allowed error and
maximum iterations\n");
   scanf("%f %f %d", &x0, &allerr,
&maxmitr);
   for (itr=1; itr<=maxmitr; itr++)
   {
      h=f(x0)/df(x0);
      x1=x0-h;
      printf(" At Iteration no. %3d, x =
%9.6f\n", itr, x1);
      if (fabs(h) < allerr)
      {
         printf("After %3d iterations, root =
%8.6f\n", itr, x1);
         return 0;
      }
      x0=x1;
```

```
    }
    printf(" The required solution does not converge or iterations are insufficient\n");
    return 1;
```

Conclusion :-

Output for **Newton Raphson Method in C** for erxample equation **f(x) = x*log10(x) – 1.2** Output for 4th iteration is x= 2.740646

Output-



Referance :-

1) S. S Shastri " Numerical Mathematics "

2) E Balgruhaswami "Programming in C"

3) Y .Kanetkar " Let's C"