**Newton’s method in C**

**Code:**

*/\*Program: Finding real roots of nonlinear*

*equation using Newton Raphson Method*

*\*/*

#include <stdio.h>

#include <conio.h>

#include <math.h>

#include <stdlib.h>

*/\*Defining equation to be solved.*

*Change this equation to solve another problem. \*/*

#define f(x) 3 \*x - cos(x) - 1

*/\*Defining derivative of g(x).*

*As you change f(x), change this function also. \*/*

#define g(x) 3 + sin(x)

**void** main()

{

**float** x0, x1, f0, f1, g0, e;

**int** step = 1, N;

system("cls");

*/\*Inputs \*/*

printf("**\n**Enter initial guess:**\n**");

scanf("%f", &x0);

printf("Enter tolerable error:**\n**");

scanf("%f", &e);

printf("Enter maximum iteration:**\n**");

scanf("%d", &N);

*/\*Implementing Newton Raphson Method \*/*

printf("**\n**Step**\t\t**x0**\t\t**f(x0)**\t\t**x1**\t\t**f(x1)**\n**");

**do** {

g0 = g(x0);

f0 = f(x0);

**if** (g0 == 0.0)

{

printf("Mathematical Error.");

exit(0);

}

x1 = x0 - f0 / g0;

printf("%d**\t\t**%f**\t**%f**\t**%f**\t**%f**\n**", step, x0, f0, x1, f1);

x0 = x1;

step = step + 1;

**if** (step > N)

{

printf("Not Convergent.");

exit(0);

}

f1 = f(x1);

} **while** (fabs(f1) > e);

printf("**\n**Root is: %f", x1);

getch();

}

**Output:**

