

Summary of C code of Newton Raphson Method:

First of all i need 2(excluding main)function. One of them will consist of our equation, another one will include derivative of this function.

In the main function, user should enter some inputs in order to complete the function. After these inputs the value of x_{k1} is calculated by calling function via the usage of formula. The following step is starting iteration with while loop and control the absolute difference of x_k and x_{k1} . If the absolute difference is less than epsilon value the iteration will stop.

C code of Newton Raphson Method

```
#include <stdio.h>

#include <stdlib.h>

#include <math.h>

float func(float A, float B, float x)
{
    return A-x+B*sin(x);
}

float derivative(float B, float x)
{
    return -1+B*cos(x);
}

int main(){
    printf("\t\t\t\t\tNewton Raphson Method\n\n\n");
    float xk,xk1,eps,A,B;int ite=2;
    printf("Equation: f(x) = A - x + Bsin(x)\n\n");
    printf("A : "); scanf("%f", &A);
    printf("B : "); scanf("%f", &B);
    printf("Equation: f(x) = %.2f -x + %.2fsin(x)\n", A,B);
```

```

printf("x0 : "); scanf("%f", &xk);
printf("Epsilon : "); scanf("%f", &eps);
xk1=xk-func(A,B,xk)/derivative(B,xk);
printf("\n1. iteration x = %.4f\n", xk1);
//purpose of fabs function is getting the absolute value
while (fabs(xk1 - xk) > eps){
    xk=xk1;
    xk1=xk-func(A,B,xk)/derivative(B,xk);
    printf("%d. iteration x = %.4f\n", ite, xk1);
    ite++;
}
printf("\nX Root: %.4f\n", xk1);
return 0;
}

```

```
"C:\Users\balay\OneDrive\Masa^nst^n\Numerical Analysis Method Codes\Newton_Raphson_Method\bin\Debug\Newton_Raphson_Met...
Newton Raphson Method

Equation:  $f(x) = A - x + B\sin(x)$ 

A : 0.7
B : 0.3
Equation:  $f(x) = 0.70 - x + 0.30\sin(x)$ 
x0 : 2
Epsilon : 0.004

1. iteration x = 1.0868
2. iteration x = 0.9459
3. iteration x = 0.9428

X Root: 0.9428

Iteration Count: 3

Process returned 0 (0x0)   execution time : 11.575 s
Press any key to continue.
```

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"C:\Users\balay\OneDrive\Masa"st\Numerical Analysis Method Codes\Newton_Raphson_Method\bin\Debug\Newton_Raphson_Met...
Newton Raphson Method

Equation: f(x) = A - x + Bsin(x)
A : 0.7
B : 0.3
Equation: f(x) = 0.70 -x + 0.30sin(x)
x0 : 6
Epsilon : 0.006

1. iteration x = -1.5621
2. iteration x = 0.4051
3. iteration x = 0.9755
4. iteration x = 0.9429
5. iteration x = 0.9428

X Root: 0.9428

Iteration Count: 5

Process returned 0 (0x0)    execution time : 9.075 s
Press any key to continue.
_
```