IMPLEMENTATION OF NEWTON RAPHSON IN PYTHON

SUBMITTED BY: UMANG KANCHAN

SUBMITTED TO: Dr. AYESHA CHOUDHARY

ASSIGNMENT 2

NUMERICAL METHODS (CS-406)

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# Assignment 2

# Subject: Numerical Methods

# Topic: Newton\_Raphson implementation in python.

# Submitted By: UMANG KANCHAN (MCA sem-1).

from sympy import \*

#  taking function input from user

inp=input("Enter an equation\n")

function=sympify(inp)

def f(*n*):

    return float(function.subs('x',*n*))

Tol\_Max=float(input("Enter the maximum tolerence\n"))

# Newton\_Raphson function definition

def Newton\_Raphson(*a*):

        x=symbols('x')

        root=float(*a*)

        condition=True

        while condition:

            if float(diff(function,x).subs('x',*a*))==0:

*a*=*a*+1

            root=*a*-(f(*a*)/float(diff(function,x).subs('x',*a*)))

            condition=(abs(root-*a*)>=Tol\_Max)

*a*=root

        print(f"The root of given Equation is {round(root,6)}\n")

def Find\_Root():

    a=float(input("Enter initial value\n"))*;*

    Newton\_Raphson(a)

try:

    Find\_Root()

except:

    print("No root possible for this initial value\n")

TEST CASE 1:

Enter an equation

x\*\*3-3\*x+1

Enter the maximum tolerence

0.0005

The root of given Equation is -1.879385

The root of given Equation is 0.347296

The root of given Equation is 1.532089

TEST CASE 2:

Enter an equation

2\*exp(x)\*sin(x)-3

Enter the maximum tolerence

0.0005

The Final root of given Equation is 0.768857

The Final root of given Equation is 3.072047