Secant method’

Pseudocode

1. Start
2. Define function as f(x)
3. Input:
4. Values of initial guesses x0 and x1
5. Absolute value of predefined error e
6. Maximum number of iterations N
7. Initialize iteration i=1
8. Do

If f(x0)=f(x1)

Print “Mathematical Error”

Stop

End if

X2=x1-(x1-x0)\*f(x1)/(f(x1)-f(x0))

X0=x1

X1=x2

Iteration=iteration+1

If iteration>N

Print “The solution does not converge”

Stop

End

While (abs(f(x1))>e)

1. Print value of x2 as approximate root of the equation
2. End

Find approximate solution with predefined error and no. of iterations

Print the phrase mathematical error on the output table with initial guesses, error and no.of iteration

Print the sentence the solution does not converge

1. X^3-4=0
2. 3x+sinx-e^x=0
3. Xe^x=cosx
4. Tanx + tanhx =0
5. e^x=x^3+cos25x

Output 1

Enter value of initial guesses x0 and x1: 1 1

Enter absolute value of predefined error e: 0.000001

Enter value of maximum number of iterations N: 20

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Iterations x0 x1 x2 f(x2)

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Mathematical error

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Process exited with return value 0

Press any key to continue . . .

Output 2

Enter value of initial guesses x0 and x1: 100 101

Enter absolute value of predefined error e: 0.000001

Enter value of maximum number of iterations N: 20

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Iterations x0 x1 x2 f(x2)

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1 100.000000 101.000000 66.997917 300730.937500

2 101.000000 66.997917 52.982082 148722.062500

3 66.997917 52.982082 39.269306 60552.347656

4 52.982082 39.269306 29.851778 26597.775391

5 39.269306 29.851778 22.474707 11348.253906

6 29.851778 22.474707 16.984903 4895.922852

7 22.474707 16.984903 12.819331 2102.667969

8 16.984903 12.819331 9.683629 904.059753

9 12.819331 9.683629 7.318501 387.982269

10 9.683629 7.318501 5.540420 166.070099

11 7.318501 5.540420 4.209775 70.606522

12 5.540420 4.209775 3.225608 29.560986

13 4.209775 3.225608 2.516811 11.942324

14 3.225608 2.516811 2.036372 4.444449

15 2.516811 2.036372 1.751587 1.373965

16 2.036372 1.751587 1.624152 0.284303

17 1.751587 1.624152 1.590903 0.026535

18 1.624152 1.590903 1.587481 0.000603

19 1.590903 1.587481 1.587401 0.000002

20 1.587481 1.587401 1.587401 -0.000000

The solution does not converge

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Process exited with return value 0

Press any key to continue . . .

Output 3

Enter value of initial guesses x0 and x1: 1 2

Enter absolute value of predefined error e: 0.000001

Enter value of maximum number of iterations N: 15

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Iterations x0 x1 x2 f(x2)

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1 1.000000 2.000000 1.428571 -1.084548

2 2.000000 1.428571 1.550459 -0.272818

3 1.428571 1.550459 1.591424 0.030491

4 1.550459 1.591424 1.587306 -0.000717

5 1.591424 1.587306 1.587401 -0.000002

6 1.587306 1.587401 1.587401 -0.000000

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The approximate solution is: 1.58740103

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Process exited with return value 13

Press any key to continue . . .

2. (i)

Let f(x) = 3x+sinx-e^x

x0 = 1

x1 = 2

f(x0) = 0.615888

f(x1) = 0.881264

e = 0.00001

N = 25 but 5

x2 = 1.700702

approximate solution = 1.89002931

3.(i)

Let f(x) = xe^x=cosx

x0 = 1.2

x1 = 3

f(x0) =

f(x1) =

e = 0.000001

N = 20 but 8

x2 = 1.886868

approximate solution = 0.51775736

4. (i)

Let f(x) = Tanx + tanhx =0

x0 = 1

x1 = 2

f(x0) =

f(x1) =

e = 0.000001

N = 20 but 8

x2 = 1.655083

approximate solution = 2.3602004

5.(i)

Let f(x) = exp(x)-x\*x\*x-cos(25\*x)

x0 = 1

x1 = 2.5

f(x0) =

f(x1) =

e = 0.00001

N = 25 but 10

x2 = 1.213219

approximate solution = 1.71758982

5.(ii)

Let f(x) = exp(x)-x\*x\*x-cos(25\*x)

x0 =

x1 =

f(x0) =

f(x1) =

e =

N =

x2 =

approximate solution =

1.

Let f(x) =

x0 =

x1 =

f(x0) =

f(x1) =

e =

N =

x2 =

approximate solution =

1.

Let f(x) =

x0 =

x1 =

f(x0) =

f(x1) =

e =

N =

x2 =

approximate solution =

1.

Let f(x) =

x0 =

x1 =

f(x0) =

f(x1) =

e =

N =

x2 =

approximate solution =

even so 2 i.e. 3x+sinx-e^x=0

Regula-falsi

Fixed point iteration