easting, northing and vector misclosure of the traverse

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16/ENG03/005
CIVIL ENGINEERING
ENG 382 Engineering Mathematics

Assignment 2

$f(x) = e^{-0.5x}(4-x)-2$

$x = 0.5$

$x_1 = x_i - \frac{F(x_i)}{f'(x_i)}$

$f(x) = e^{-0.5x}(4-x)-2$

$u = e^{-0.5x}$

$u = 4-x$

$\frac{dy}{dx} = u\frac{dv}{dx} + v\frac{du}{dx}$

$f'(x) = e^{-0.5x}(-1) + 0.5e^{-0.5x}(4-x)$

$f'(x) = -e^{-0.5x} - 0.5e^{-0.5x}(4-x)$

at $x_0 = 0.5$

$F(x_0) = e^{-0.5(0.5)}(4-0.5)-2$

$f(x_0) = 0.7258027$

$f'(x) = -e^{-0.5(0.5)} - 0.5e^{-0.5(0.5)}(4-0.5)$

$f'(x_0) = -2.1417022$

$x_1 = 0.5 - \frac{0.7258027}{-2.1417022}$

$x_1 = 0.83889058$

$f(x_1) = e^{-0.83889058}(4-0.83889058)-2$

$f(x_1) = 0.07814934$

$f'(x_1) = -e^{(-0.5)(0.83889058)} - 0.5e^{-0.5(0.7258027)}(4-0.83889058)$

$f''(x_1) = -1.6964861$

$x_1 = 0.83859058 - \frac{0.07814934}{-1.6964861}$

$x_2 = 0.8849560$

$f(x_2) = e^{-0.5(0.884956)}(4 - 0.884956) - 2$

$f(x_2) = 0.001236579$

$f'(x_2) = -e^{-0.5(0.884956)} - 0.5e^{-0.5(0.884956)}(4 - 0.884956)$

$f'(x_2) = -1.643061$

$x_3 = 0.884956 - \frac{0.001236579}{-1.643061}$

$x_3 = 0.88570861$

$f(x_3) = e^{-0.5(0.88570861)}(4 - 0.88570861) - 2$

$f(x_3) = 3.204469 \times 10^{-4}$

$f'(x_3) = -e^{0.5(0.88570861)} - 0.5e^{-0.5(0.5570861)}(4 - 0.88570861)$

$f'(x_3) = -1.642201$

$(x_4) = 0.88570861 - \frac{3.204469 \times 10^{-9}}{-1.642201}$

$x_4 = 0.8857088051$

$f(x_4) = e^{-0.5(0.8857088051)}(4 - 0.8857088051) - 2$

$f(x_4) = -5.08297 \times 10^{-9}$

$f'(x_4) = -e^{-0.5(0.8857088051)} - 0.5e^{-0.5(0.8857088051)}(4 - 0.8857088051)$

$f'(x_4) = -1.643164724$

$x_5 = 0.8857085051 - \frac{-5.032976 \times 10^{-9}}{-1.682164724}$

$x_5 = 0.885708502$

MATLAB

~~clear~~

common window

clear

clc

function [x1, crr, cellc] = ass2(x0, Maxe1, tol, ltrs, t-tpanel)

```
x0 = 0.5;
Max1 = 100;
tol = 0.0000000I;
Iter = I;
f=@(x) ((exp(0.5 * x)) * (4-x)) - 2;
fprime=@(x) (-exp (-0.5* x)) + ((-0.5 * exp(-0.5 * x) * (4-x));
for j=I Max1 :
    x I = x0 - feval (f,x0) / feval (f prim, x0);
    err = abs ( x2 - x0); relerr = abs (x1 - x0)/x1;
fprintf (% I.0f % 10.10f % 10.10f % 10.10f \n;
            Iter, x0, x1 err, relerr)
    x0 = x1 , Iter = 1 + Iter;
    if err <= tol,
    break,
    end.
```

Ast
Assignment

M_1 =
M_2 =
M_3 =

```
x0 = 0.5;
MaxI = 100;
tol = 0.00000001;
Iter = 1;
f = @(x) ((exp(0.5 * x)) * (4 - x)) - 2;
fprime = @(x) (-exp(-0.5 * x)) + ((-0.5 * exp(-0.5 * x)) * (4 - x));
  for i = 1 MaxI
    x1 = x0 - feval(f, x0) / feval(fprob, x0);
    err = abs(x2 - x0); reler = abs(x1 - x0)/x1;
  fprintf('%1.0f %10.10f %10.10f %10.10f \n',
         Iter, x0, x1, err, reler)
     x0 = x1, Iter = 1 + Iter;
     if err <= tol,
     break,
     end
```