
Newton Convergence Demo

```
clear
clc
close 'all'

% find the square root of two
F = @(x) x.^2 - 2;
dF = @(x) 2*x;

Xest = 1.; % initial guess

Err = 1e-16;
imax = 5;
fprintf('Exact solution to full double precetion = %16.15f\n',sqrt(2));
for i = 1:imax
    Xi = Xest - F(Xest)/dF(Xest);

    if abs((Xi - Xest)/Xest) < Err
        xNS = Xi;
        break;
    end

    fprintf('After %i iterations, Xi = %16.15f \n',i,Xi);

    Xest = Xi;
end

Exact solution to full double precetion = 1.414213562373095
After 1 iterations, Xi = 1.500000000000000
After 2 iterations, Xi = 1.416666666666667
After 3 iterations, Xi = 1.414215686274510
After 4 iterations, Xi = 1.414213562374690
After 5 iterations, Xi = 1.414213562373095
```

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