
Secant Convergence Demo

```
clear
clc
close 'all'

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

Xa = 0;
Xb = 2;

Err = 1e-16;
imax = 15;
fprintf('Exact solution to full double precetion = %16.15f\n',sqrt(2));
for i = 1:imax
    FXb = F(Xb);
    Xi = Xb - FXb*(Xa - Xb)/(F(Xa) - FXb);

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

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

end

Exact solution to full double precetion = 1.414213562373095
After 1 iterations, Xi = 1.000000000000000
After 2 iterations, Xi = 1.333333333333333
After 3 iterations, Xi = 1.428571428571429
After 4 iterations, Xi = 1.413793103448276
After 5 iterations, Xi = 1.414211438474870
After 6 iterations, Xi = 1.414213562688870
After 7 iterations, Xi = 1.414213562373095
After 8 iterations, Xi = 1.414213562373095
After 9 iterations, Xi = 1.414213562373095
After 10 iterations, Xi = 1.414213562373095
```

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