Computing Assignment: Root Finding 2D contour

SMethod function file, Kai Sackville-Hii (feb 4, 2019)

```
function xS = SMethod(ff, a, b, tol)
%BMethod Implementation of the bisection method.
%Pre:
%   f = function to be approximated.
%   a, b = Initial guess.
%   tol = The tolorence condition.
%Post:
%   p = The approximated value.

%  0)  set two initial guesses
x0 = a  ;  f0 = ff(x0);
x1 = b;
Nevals = 1;
itmax = 100;

% figure(100);  clf;  hold on;  grid on
check = x1-x0;
% plot(Nevals,log10(abs(check)),'rx')

Nevals_arr = [];

%  root-finding loop
while (abs(check)>tol)
 if Nevals > itmax
  disp('no convergence')
  return
 end

 %  1)  function evaluation at x1
 f1 = ff(x1);
    Nevals_arr(Nevals) = Nevals + 1;
 Nevals = Nevals + 1;

%  fprintf('\t %d \t %16.15f \t %+6.5e \t %+16.15f \t %+6.5e \t %+6.5e
 \n', ...
%   [Nevals, x0, f0, x1, f1, check])

 %  2)  secant update
 xS = x1 - (f1 * (x1-x0)/(f1-f0));

 %  3)  prepare next iteration
 x0 = x1;  f0 = f1;
 x1 = xS;

 check = x1-x0;
%  plot(Nevals,log10(abs(check)),'kx')
```

```
end

% disp(max(Nevals_arr));
end
```

```
Not enough input arguments.

Error in SMethod (line 14)
x0 = a  ;  f0 = ff(x0);
```

Published with MATLAB® R2018b