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% ------------ Matlab script file demoprog1.m ------------------------
% Demo Program for a MATLAB script file
% Aim: Introduce some basic Matlab commands
% Problem: Generate graphs for the following two nonlinear equations
% Equation 1: f1(x) = x(1)^2 + x(2)^2 - 4 = 0
% Equation 2: f2(x) = x(1) * x(2) - 1 = 0
% Plot these two graphs on same plot

clear all    % This command clears the workspace
close all    % This command closes all Matlab created graphics windows
clc          % This command clears the crean

% create vector x starting from x = 0.3 to x = 2 such that
% difference between two successive elements is 0.1

dx = input('Input increment bet. 0.01 to 0.1: ') ;

if( dx < 0.01 )        % This is how an if-then-else construct is used
   dx = 0.01 ;
elseif ( dx > 0.01 )
    dx = 0.1 ;
end

xvec = 0.3:dx:2 ;     % This command creates a vector with xvec(1) = 0.3
                      % and xvec(N) = 2 with the successive elements
                      % differing by dx
nx = length( xvec )
xvec                  %  typing variable name without semicolon will
                      %  display the variable

% pause command waits till you hit some key on the keyboard

fprintf('\n\n \t Hit Any Key to Continue! \n'), pause
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% Using elements of xvec, generate function elements

for i = 1: nx
   y1(i) = 1 / xvec(i) ;
   y2(i) = sqrt( 4 - xvec(i)^2) ;
end

% Plot the graphs for f1(x) and f2(x)

plot(xvec,y1, 'b')       % First plot xvec v/s y1 in blue color
hold on
plot( xvec, y2, 'r' )    % Then plot xvec v/s y2 in red color in same figure
hold off
grid                     % Draw Grid
% Label your figure and give figure title
xlabel('x (sec)'), ylabel('y_1 and y_2 (^0C)'), title('2-dim Nonlinear Functions')
```