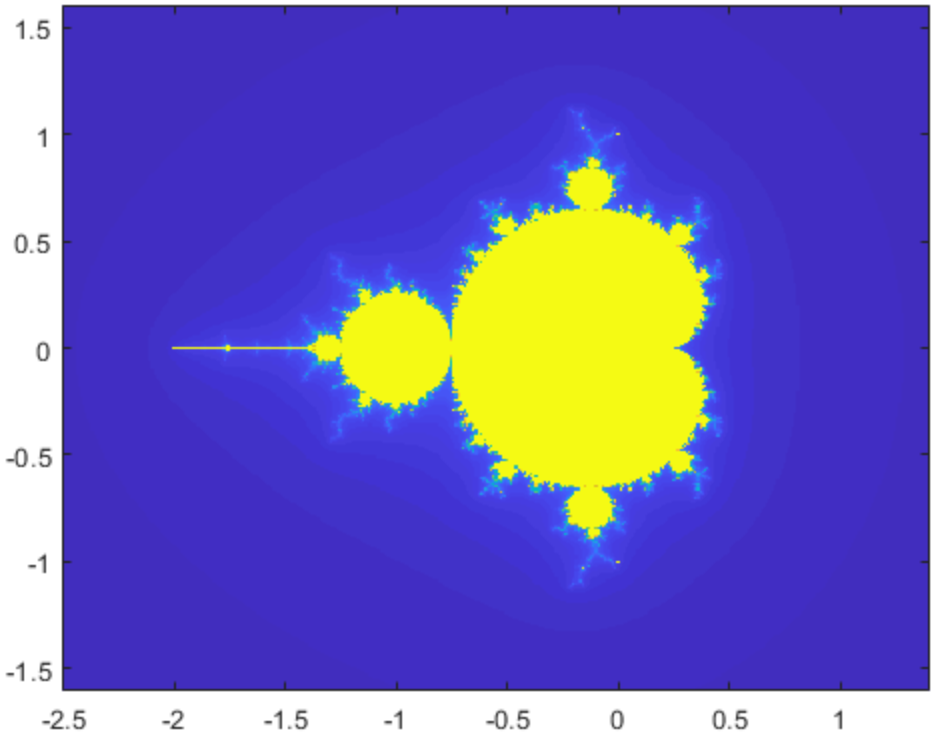
```
% Part 8
%Generate the Mandelbrot set associated with phi(z) = z^2 + c.

M = zeros(321,391);        %Initialize array of point colors to 0.

for j=1:321                %Try initial values with imaginary parts
 between
    y = -1.6 + (j-1)*.01;         %   -1.6 and 1.6
    for i=1:391                   %and with real parts between
        x = -2.5 + (i-1)*.01;     %   -2.5 and 1.4.
        c = x + 1i*y;             %1i is the MATLAB symbol for
 sqrt(-1).
        phi = @(z) z^2 + c;       %set function equal to z^2 + c
        z = 0;        %instead of zk=z, we set z=0 since we want orbit
 of 0
        kount = 0;    %kount is the total number of iterations.

        while kount < 100 && abs(z) <= 100  %modz and kount less than
 100 to color c by iteration number
            kount = kount+1;
            z = phi(z);           %This is the fixed point iteration.
        end

        M(j,i) = kount;           %Establish the colors of our points

    end
end

numColors = parula(100);   %parula(m) returns the colormap with m
 colors.
colormap(numColors)        %Creates color map for our graph
image([-2.5 1.4],[-1.6 1.6],M),  % This plots the results.
axis xy                         % If you don't do this, vertical axis
 is inverted.
```



Published with MATLAB® R2019b