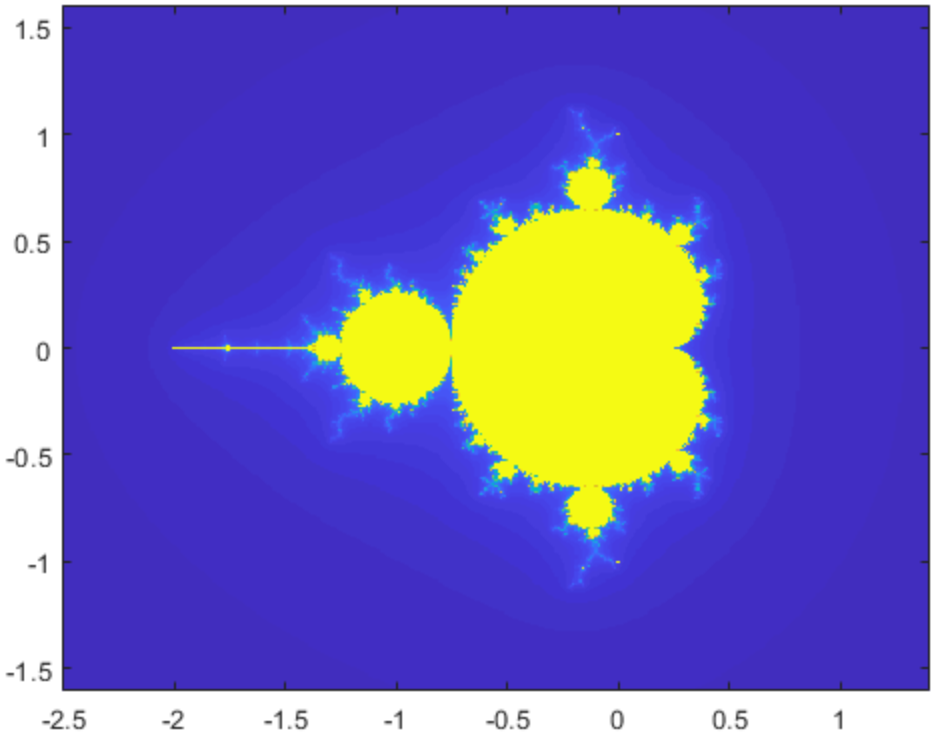
```
% Part 8
%Generate the Mandelbrot set associated with phi(z) = z^2 + c.

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.
```



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