

Interp1Example.m

```
% MATLAB Built-In Function interp1 and spline
%
% YI = INTERP1(X, Y, XI, METHOD) specifies alternate methods.
% The default is linear interpolation. Use an empty matrix [] to specify the default. Available methods are:
% 'nearest' - nearest neighbor interpolation
% 'linear' - linear interpolation
% 'spline' - piecewise cubic spline interpolation (SPLINE)
% 'pchip' - shape-preserving piecewise cubic Hermite interpolation

% Example : interp1
% Consider the data for x = -2:0.5:2 generated by y = (1/4)x^4 - (1/2)x^2.
% Interpolate and plot using the four different methods listed in interp1.

% specify the x array starting from -2 to 2 with increment of 0.5
x = -2:0.5:2;

% specify the y array using the formula
y = (1./4.) * x.^4 - (1./2.) * x.^2;

% generate a row vector of 100 evenly spaced points between -2 and 2
xi = linspace(-2, 2);

% call interp1 with nearest neighbor interpolation
ynear = interp1(x, y, xi, 'nearest');

% call interp1 with linear interpolation
ylin = interp1(x, y, xi, 'linear');

% call interp1 with piecewise cubic Hermite interpolation
ypc = interp1(x, y, xi, 'pchip');

% call interp1 with piecewise cubic spline interpolation
yspl = interp1(x, y, xi, 'spline');

% start drawing the four plots side-by-side
subplot(2, 2, 1), plot(xi, ynear, x, y, 'o'), title('Nearest neighbor interpolation')
axis([-2 2 -0.5 2])
hold on
subplot(2, 2, 2), plot(xi, ylin, x, y, 'o'), title('Linear interpolation')
axis([-2 2 -0.5 2])
subplot(2, 2, 3), plot(xi, ypc, x, y, 'o'), title('Piecewise cubic Hermite interpolation')
axis([-2 2 -0.5 2])
subplot(2, 2, 4), plot(xi, yspl, x, y, 'o'), title('Cubic spline interpolation')
axis([-2 2 -0.5 2])
```

To run Interp1Example.m,
type "Interp1Example" on matlab prompt, and hit return.

