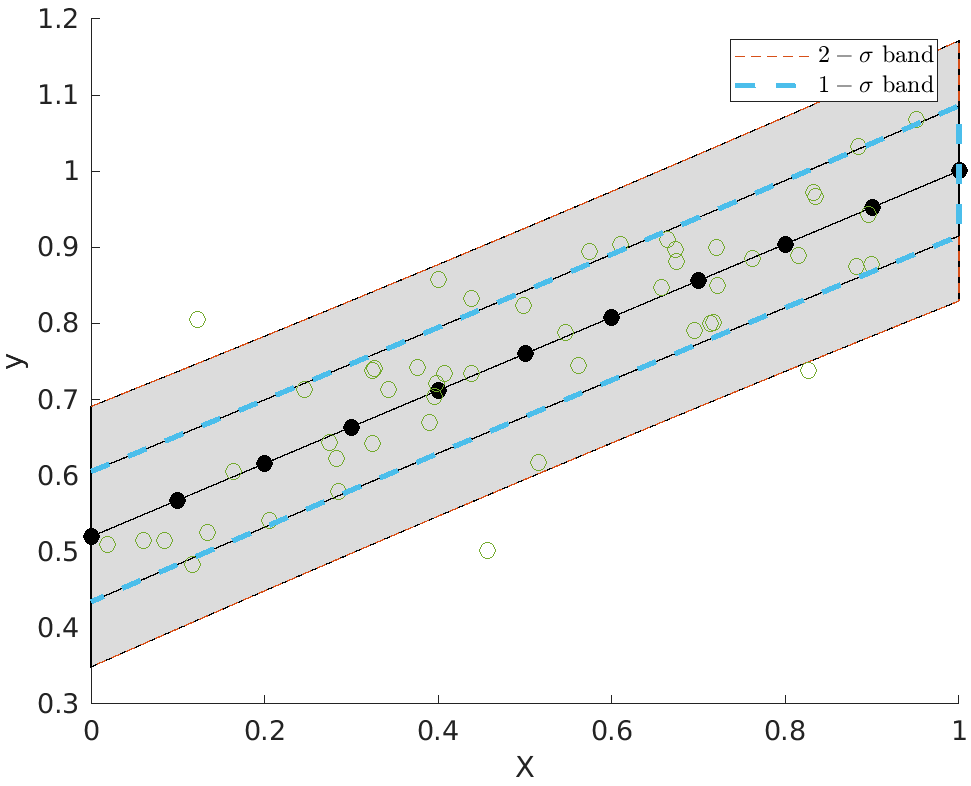
```
%Following code is utilized to perform regression using gaussian
 process
%software
% Audthor- Susan Sapkota
% Assignment 7.1
clear all;
meanfunc = [];                              % empty: don't use a mean
 function
covfunc = {@covSum,{@covLIN,@covConst}};    % Linear covariance
 function
likfunc = @likGauss;                        % Gaussian likelihood
hyp = struct('mean', [],'cov', 0, 'lik', -1);
N=50;
x=rand(N,1);
y=0.5*x+0.5+0.1*randn(size(x));
hyp2 = minimize(hyp, @gp, -100, @infGaussLik, meanfunc, covfunc,
 likfunc, x, y);
xs=(0:0.1:1)';
[mu s2] = gp(hyp2, @infGaussLik, meanfunc, covfunc, likfunc, x, y,
 xs);
f = [mu+2*sqrt(s2); flipdim(mu-2*sqrt(s2),1)];
hold on
f1 = [mu+sqrt(s2); flipdim(mu-sqrt(s2),1)];
fill([xs; flipdim(xs,1)], f,[7 7 7]/8)
p1 = plot([xs; flipdim(xs,1)], f,"--")
hold on;
fill([xs; flipdim(xs,1)], f1, [7 7 7]/8)
hold on;
plot(xs, mu,"-
o","MarkerEdgeColor","k","MarkerFaceColor","k",'Color','k');
hold on
plot(x, y, 'o')
hold on
p2 = plot([xs; flipdim(xs,1)], f1,"--",'linewidth',2)
hold on
leg1 = legend([p1 p2],'$2-\sigma  $ band','$1-\sigma $ band')
set(leg1,'Interpreter','latex');
xlabel('X')
ylabel('y')
```

```
Function evaluation      0;  Value 1.959147e+00 Function evaluation
      8;  Value -4.748315e+01 Function evaluation     11;  Value
 -4.775385e+01 Function evaluation     15;  Value -4.775408e+01
 Function evaluation     18;  Value -4.775432e+01 Function evaluation
    22;  Value -4.775432e+01

p1 =

  Line with properties:

            Color: [0.8500 0.3250 0.0980]
        LineStyle: '--'
        LineWidth: 0.5000
```

```
            Marker: 'none'
        MarkerSize: 6
    MarkerFaceColor: 'none'
             XData: [1×22 double]
             YData: [1×22 double]
             ZData: [1×0 double]

  Use GET to show all properties


p2 =

  Line with properties:

             Color: [0.3010 0.7450 0.9330]
         LineStyle: '--'
         LineWidth: 2
            Marker: 'none'
        MarkerSize: 6
    MarkerFaceColor: 'none'
             XData: [1×22 double]
             YData: [1×22 double]
             ZData: [1×0 double]

  Use GET to show all properties


leg1 =

  Legend ($2-\sigma  $ band, $1-\sigma $ band) with properties:

          String: {'$2-\sigma  $ band'  '$1-\sigma $ band'}
        Location: 'northeast'
    Orientation: 'vertical'
        FontSize: 9
        Position: [0.6685 0.8252 0.2179 0.0744]
           Units: 'normalized'

  Use GET to show all properties
```



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