```matlab
clc; clear all; close all
% Same as CurveFitlsq but uses a higher amount of data points
% Behavior is good because even though there should be
% a "drop" the function compensates and does not generate a drop
% The only problem is that the function only behaves properly when the
 data
% starts at 0 for y-axis
% Also, Here I am trying different levels of gaussian noise
s = 1:.01:25;
%y = [0 2 4.8 5.2 5 5.6];
n = numel(s)-1;
y1 = 2.*s(1:n/2) - 1;
y2 = 23*ones(1,n/2);

for k = 1:10

y1o = awgn(y1,k,'measured');
y2o = awgn(y2,k,'measured');

y = [y1o y2o];
x0 = [0.9 2.9 4.89 7.85 11.50];

fun1 = @(x,s) ((x(5)./(x(2)-x(1))).*(s - x(1))).*(heaviside(s-x(1)) -
 heaviside(s-x(2))) +...
     x(5).*(heaviside(s-x(2))-heaviside(s-x(3))) + ...
( ( x(5)./(x(4)-x(3))).*(-s+x(3))+ x(5) ).*(heaviside(s-x(3)) -
 heaviside(s-x(4)));

x = lsqcurvefit(fun1,x0,s(1:end-1),y)
times = linspace(s(1),s(end-1));
figure
hold on; plot(s(1:end-1),y,'bo')
plot(times,fun1(x,times),'k-','linewidth',2)
xlim([times(1), times(end)+5])
legend('Data','Fitted Response','location','best');
title('Data and Fitted Curve'); grid on

end
```

Local minimum possible.

*lsqcurvefit stopped because the final change in the sum of squares
 relative to
its initial value is less than the default value of the function
 tolerance.*

x =
    0.6179   12.0403   26.8336   157.9630   23.6853

Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares relative to
its initial value is less than the default value of the function tolerance.

x =
    0.6868   11.9344   25.1988   165.3968   23.2966

Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares relative to
its initial value is less than the default value of the function tolerance.

x =
    0.2047   11.3824   21.6677   95.1413   22.6114

Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares relative to
its initial value is less than the default value of the function tolerance.

x =
    1.3613   11.9658   26.4054   73.7812   23.2652

Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares relative to
its initial value is less than the default value of the function tolerance.

x =
    0.4505   11.3044   24.8391   26.9208   22.5820

Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares relative to
its initial value is less than the default value of the function tolerance.

```
x =
    0.3585    12.0552    24.7978    49.9323    23.4257
```
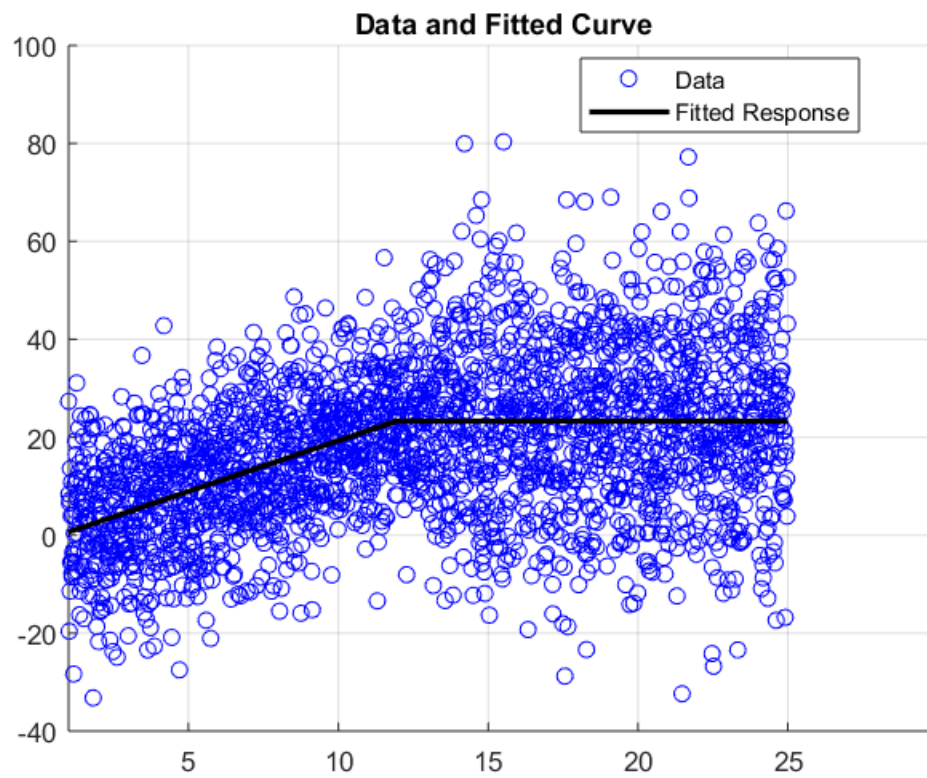
Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares
 relative to
its initial value is less than the default value of the function
 tolerance.


```
x =
    0.8858    12.2503    25.0265    60.7205    23.3838
```

Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares
 relative to
its initial value is less than the default value of the function
 tolerance.
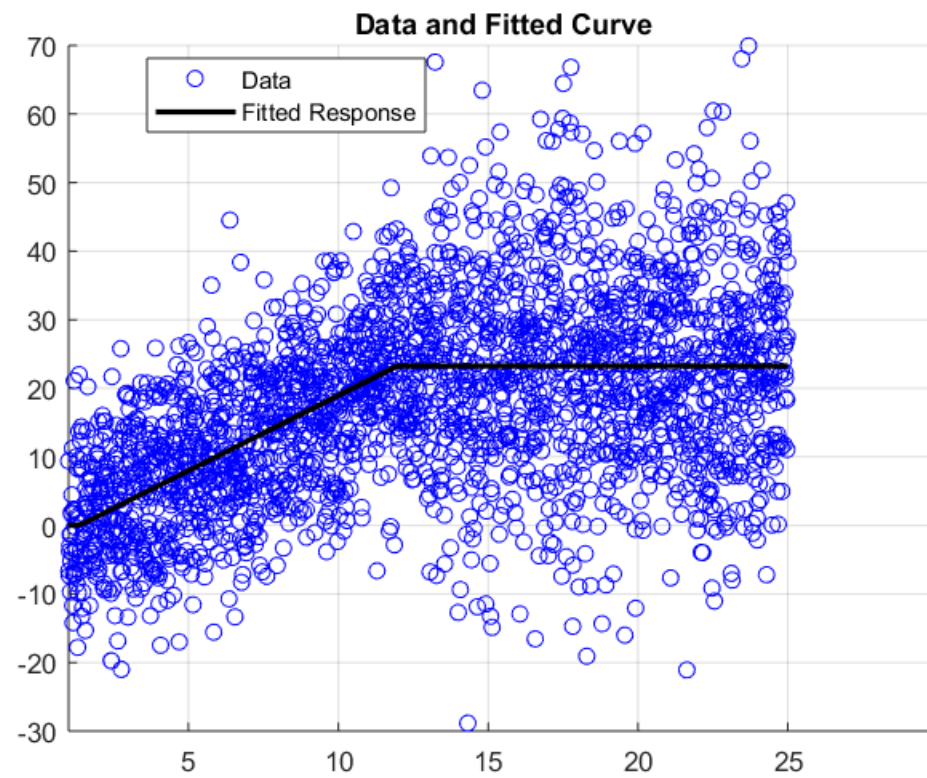

```
x =
    0.2905    11.9039    27.8672    145.2135    22.9436
```
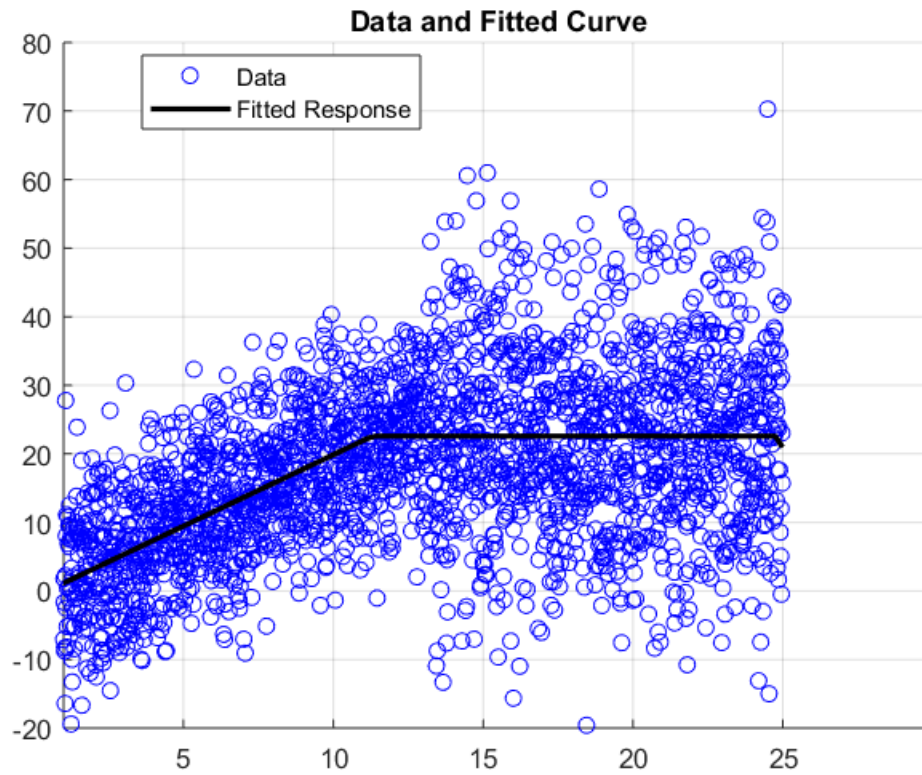
Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares
 relative to
its initial value is less than the default value of the function
 tolerance.


```
x =
    0.2974    12.2796    25.1477    403.6085    22.7892
```
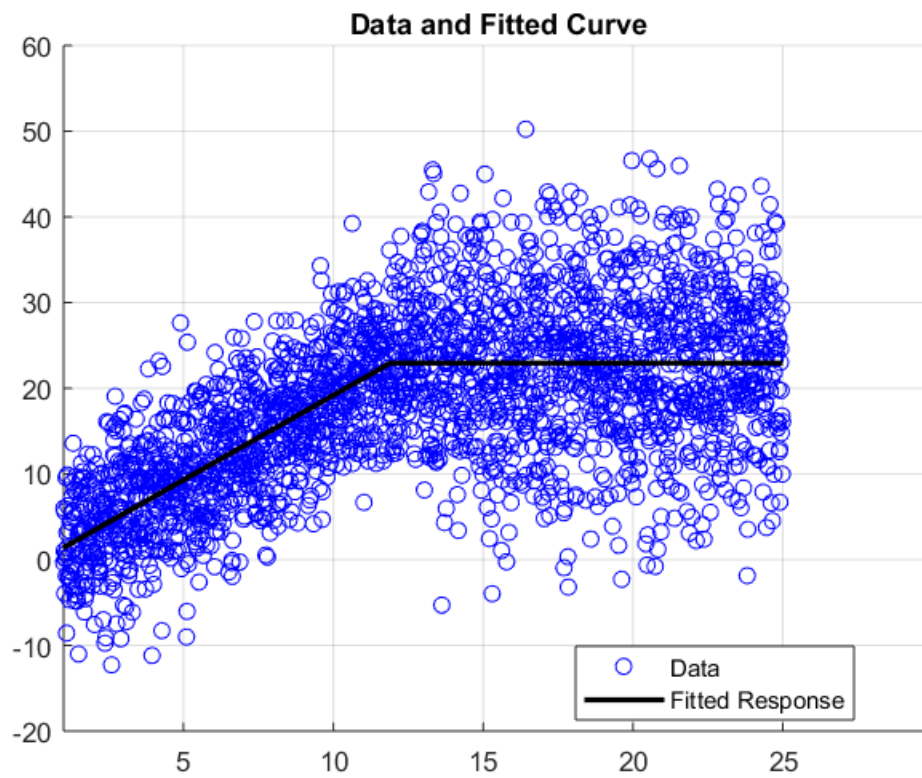
Local minimum possible.

lsqcurvefit stopped because the final change in the sum of squares
 relative to
its initial value is less than the default value of the function
 tolerance.


```
x =
    0.3483    12.0540    26.4049    161.5408    23.1832
```
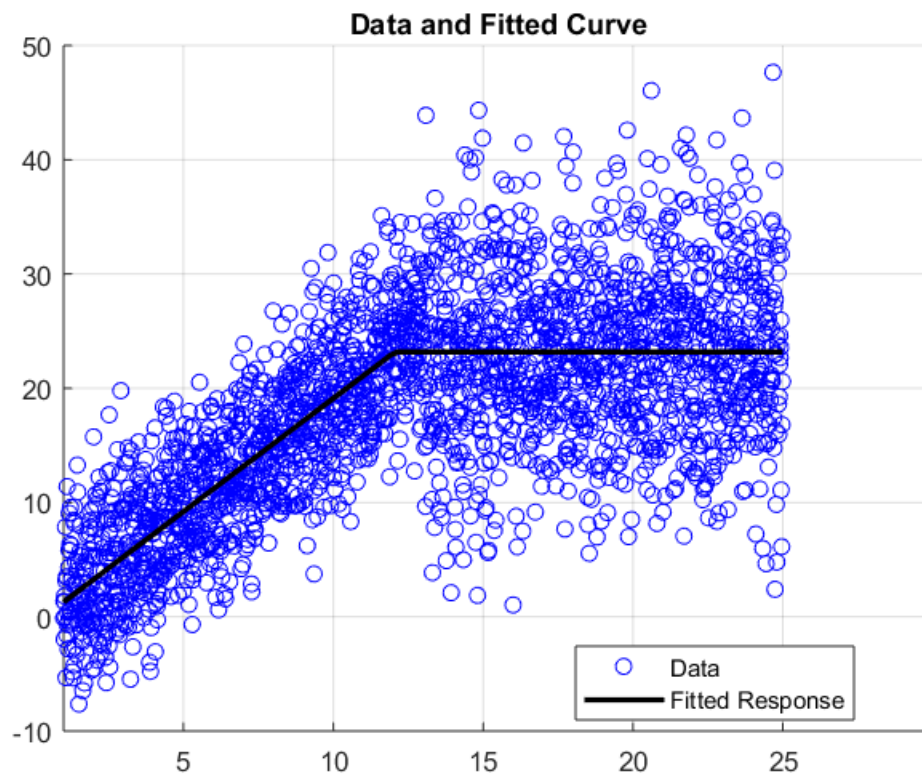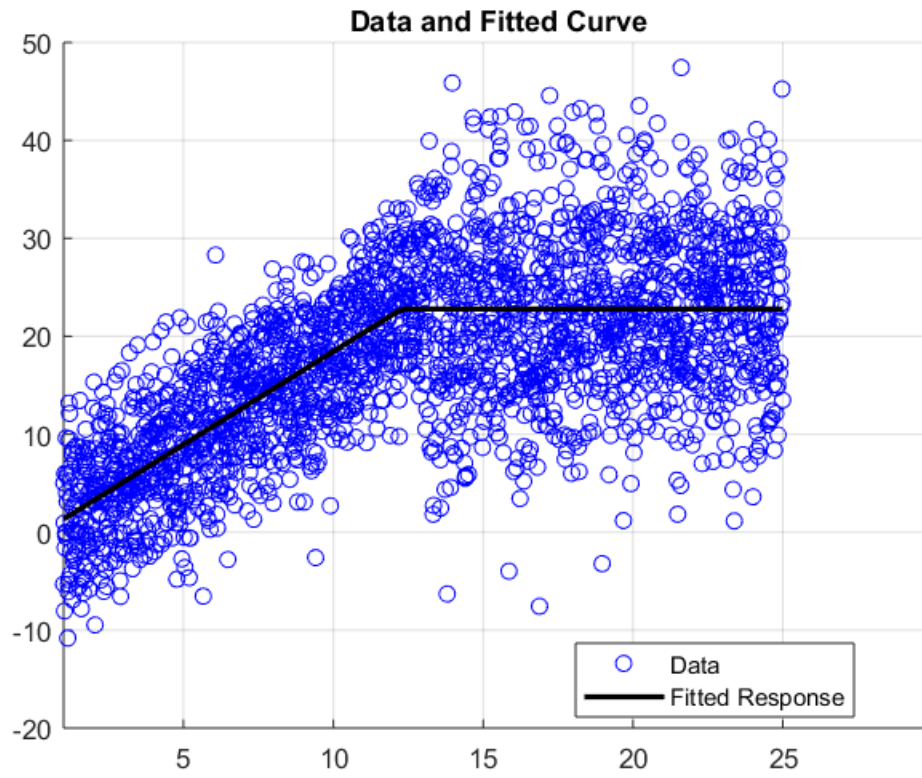
Data and Fitted Curve

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