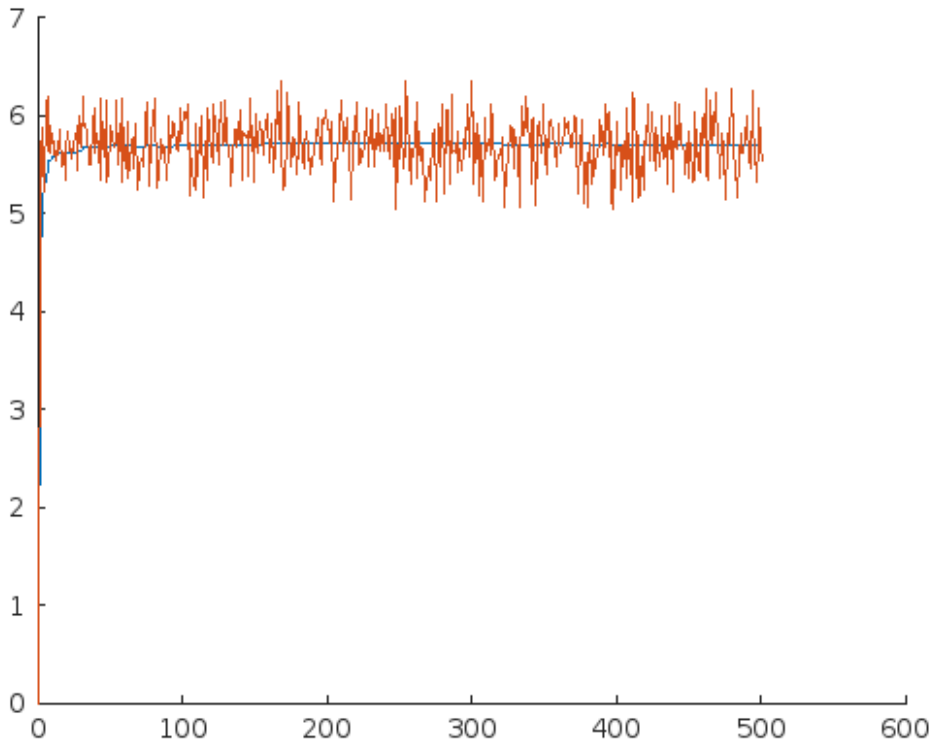
```
%%%%%%%%%%%%%%%% ARRAY OF MEASUREMENT %%%%%%%%%%%%%%%%
%%%%% Assume that the object is located at (3,4) %%%%%
%%%%% Position of the object measured 500 times %%%%%%
dataWithError = [];
for i=1:500
    % 3 + {0 < number > 1} %
    x = 3 + rand;

    % 4 + {0 < number > 1} %
    y = 4 + rand;

    % Distance to origin %
    dataWithError(end+1) = sqrt(x^2 + y^2);
end

%%%% FILL z OF KALMAN FILTER WITH DATA WITH ERROR %%%%
z(:,1) = 0;
for m = 1:length(dataWithError)
    z(:,m+1) = dataWithError(m);
end

%%%%%%% INITIALIZE VARIABLES OF KALMAN FILTER %%%%%%%%
H = 1;
F = 1;
G = 1;
u = 0;
N = length(dataWithError);
R = std(dataWithError);
I = 1;
Q = 0;
P = 1;

%%%%%%%%%%%% RUN KALMAN FILTER ALGORITH %%%%%%%%%%%%
x(:, 1) = 0;
for k = 2:N
    x(:, k) = F*x(:, k-1) + G*u;
    P = F*P*F' + Q;
    K = P*H' / (H*P*H' + R);
    x(:,k) = x(:,k) + K*(z(k) - H*x(:,k));
    P = (I - K*H)*P;
end

%%%% DISPLAY AND PLOT KALMAN PREDICTION VARIABLE %%%%
hold on;
plot(x);
hold on;
plot(z);
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```



Published with MATLAB® R2022b