

# Linear Regression

```
clc
clear
close all
```

## Source

[Linear Regression 1 \[Matlab\]](#)

## Code

### Linear Regression 1

Generate noisy data

```
m = 3; % true slope
x = [-2:0.25:2]';
true = m.*x; % true relation
y = m.*x + 1*randn(size(x)); % add noise to true relation

plot(x,true,'k','linewidth',2) % plot true relation
hold on
plot(x,y,'o','linewidth',2) % plot noisy measurements
```

Compute least squares approximation

```
[U,S,V] = svd(x,'econ');
xtilde = V*inv(S)*U'*y; % Least-square fit

plot(x,xtilde*x,'b--','LineWidth',2) % plot fit
hold off
grid on
xlabel('$a$', 'Interpreter', 'latex', 'FontSize', 16)
ylabel('$b$', 'Interpreter', 'latex', 'FontSize', 16)
title('Linear Regression', 'Interpreter', 'latex', 'FontSize', 16)
legend('True relation', 'Noisy data', 'Regression line', [' ' ...
    'FontSize'], 14, 'location', 'southeast')
```

Example: Linear Regression

