Fitting a Line to Data

- Studies have shown that there is a strong correlation between muscle strength and lean body mass.
- Measurements were taken of 100 subjects and their lean body mass was plotted against muscle strength to yield the following table.

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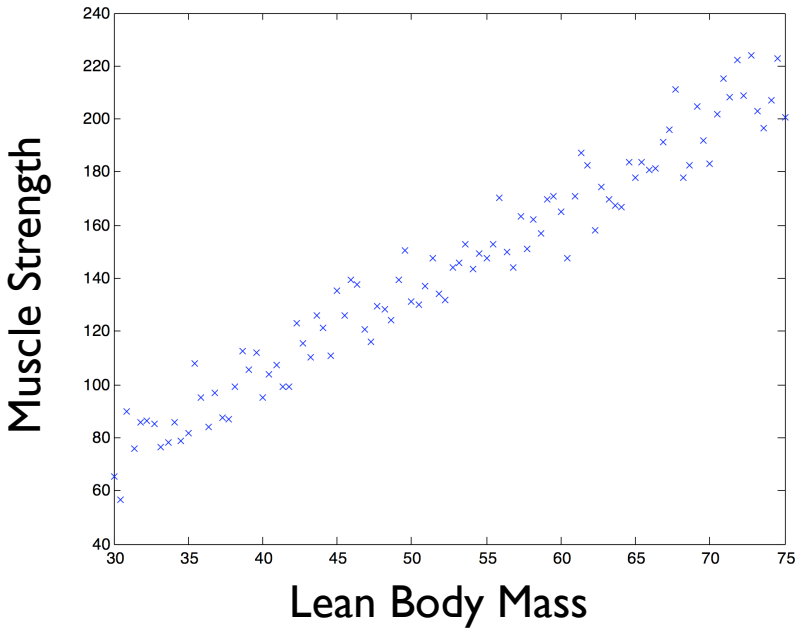

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- This scatter plot suggests a linear relationship between lean body mass and muscle strength.
- What is the best line to capture this relationship?

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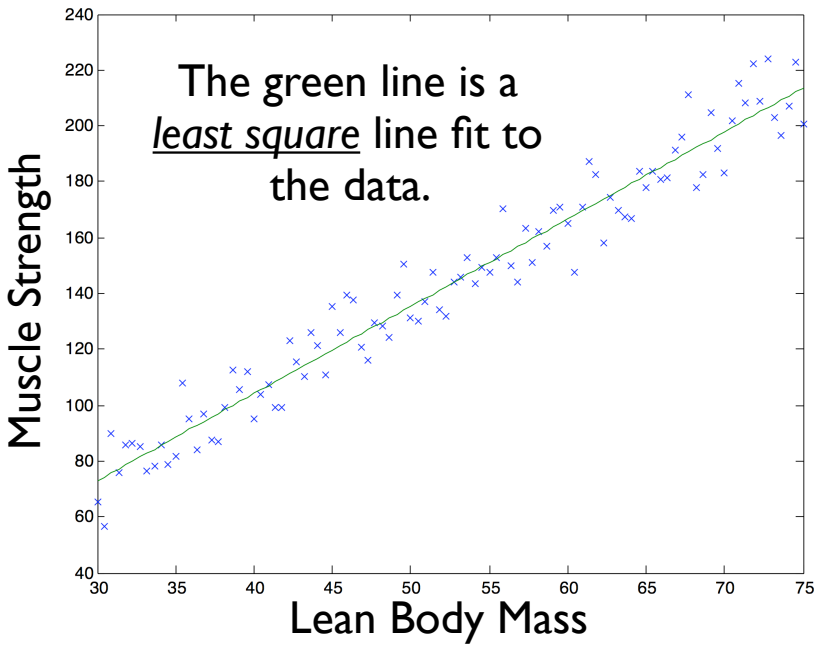

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- We will see what is meant by a best least square line fit, and why this is a reasonable way to perform line fitting.
- We will see an algorithm to compute a least square line fit. We will also see how to use some built-in Matlab commands to do this.
- We will also see how to generalize these ideas to fit other curves to data.

Fitting a Line to Data

- The first plot was made as follows:

```
> X = linspace(30,75);
> Y = 3.*X – 13 + randn(1,100).*10;
> plot(X,Y,'x');
```

- I then used polyfit to fit the line:

```
> polyfit(X,Y,1)
          ans = 3.1253  -20.8468
> plot(X,Y,'x',X, 3.1253.*X – 20.8468)
```