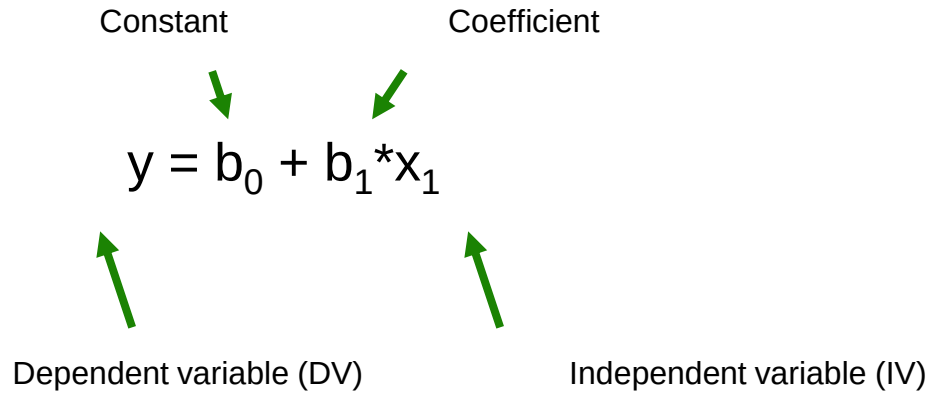
Regression & Classification Intuition

Simple Linear Regression

Intuition – Step 1

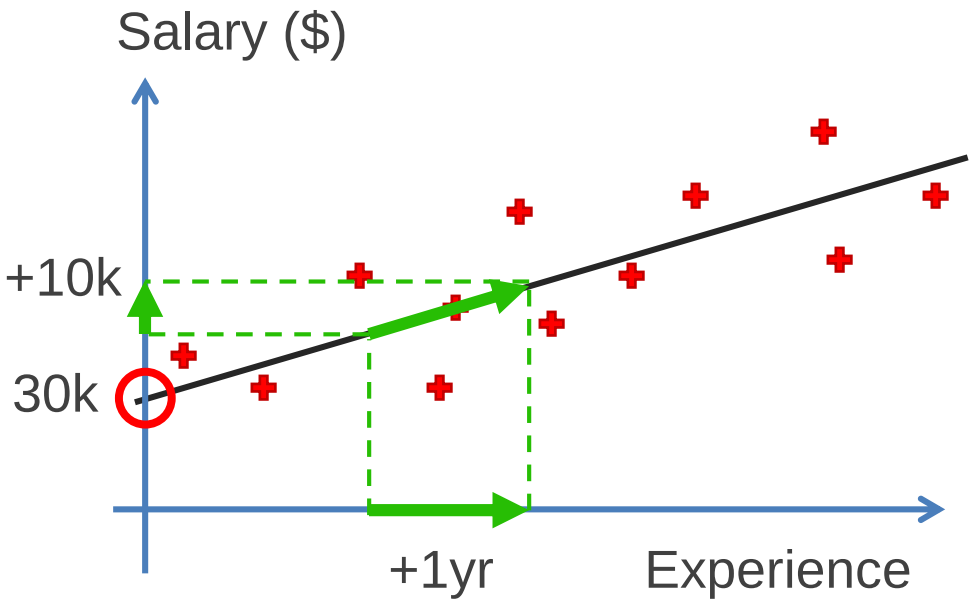
Regressions

Simple Linear Regression



Regressions

Simple Linear Regression:



$y = b_0 + b_1 * x$

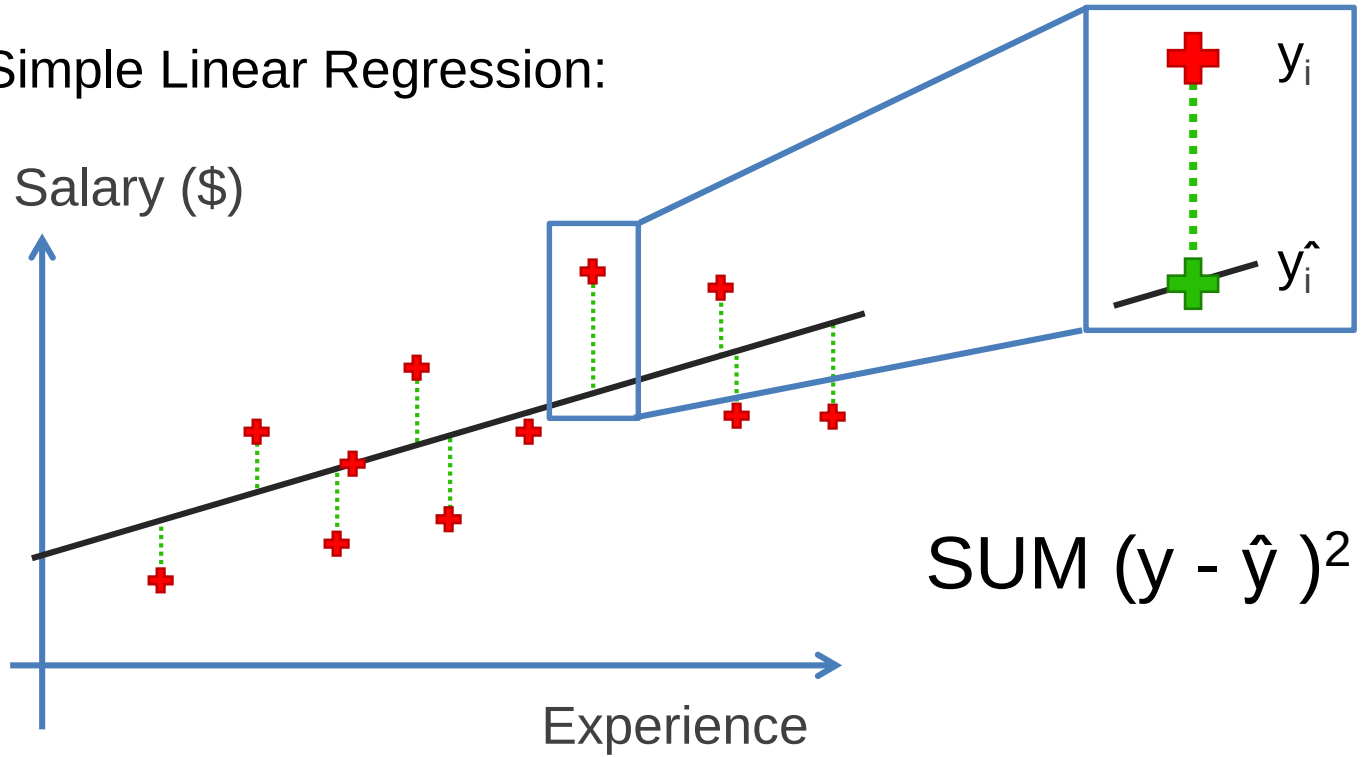
Salary = b_0 + b_1 *Experience

Simple Linear Regression

Intuition – Step 2

Ordinary Least Squares

Simple Linear Regression:



$$SUM\ (y - \hat{y})^2 \quad \rightarrow \min$$

Multiple Linear Regression

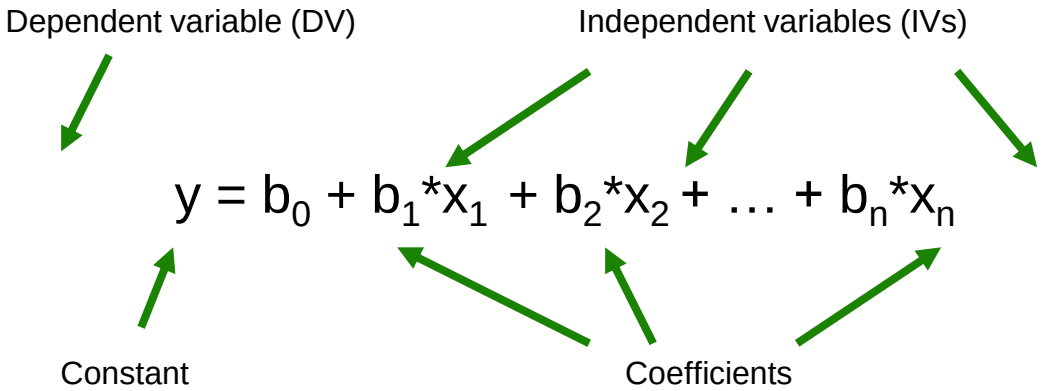
Intuition

Regressions

Simple Linear Regression

$$y = b_0 + b_1 * x_1$$

Multiple Linear Regression



Logistic Regression Intuition

Logistic Regression

Linear Regression:

- Simple:

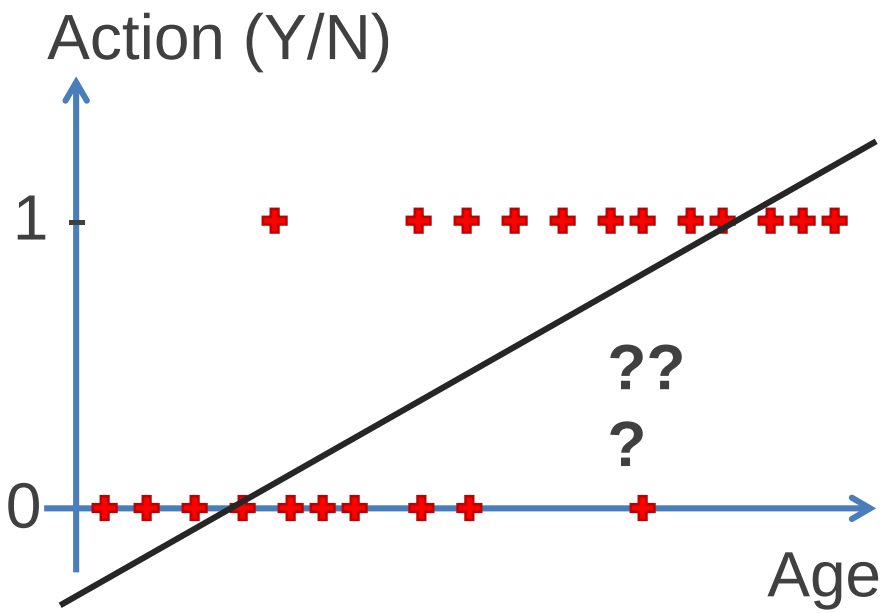
$$y = b_0 + b_1 * x$$

- Multiple:

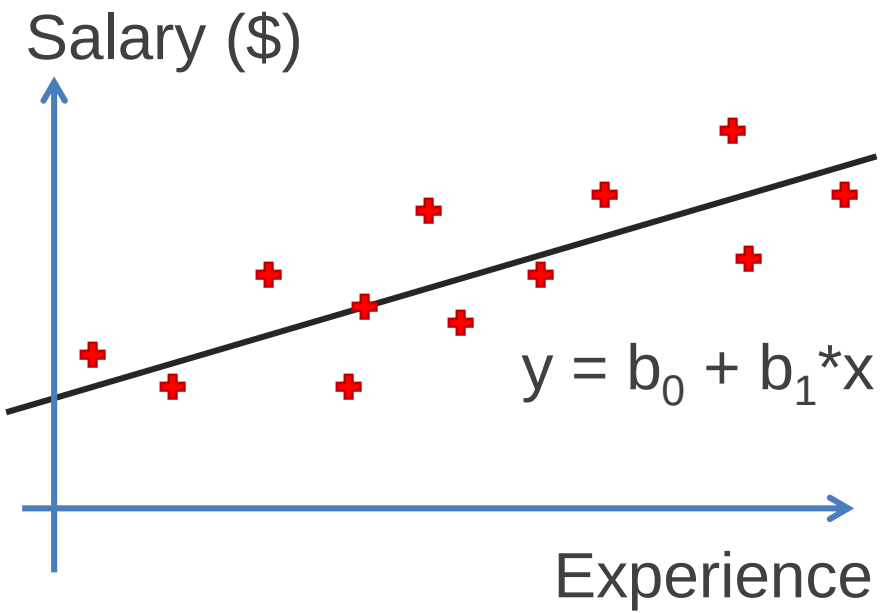
$$y = b_0 + b_1 * x_1 + \ldots + b_n * x_n$$

Logistic Regression

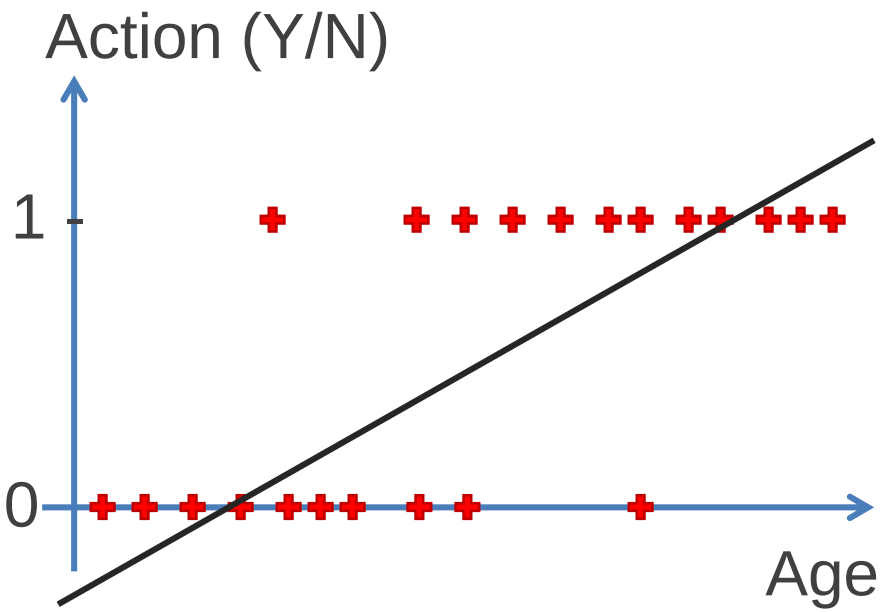
This is new:



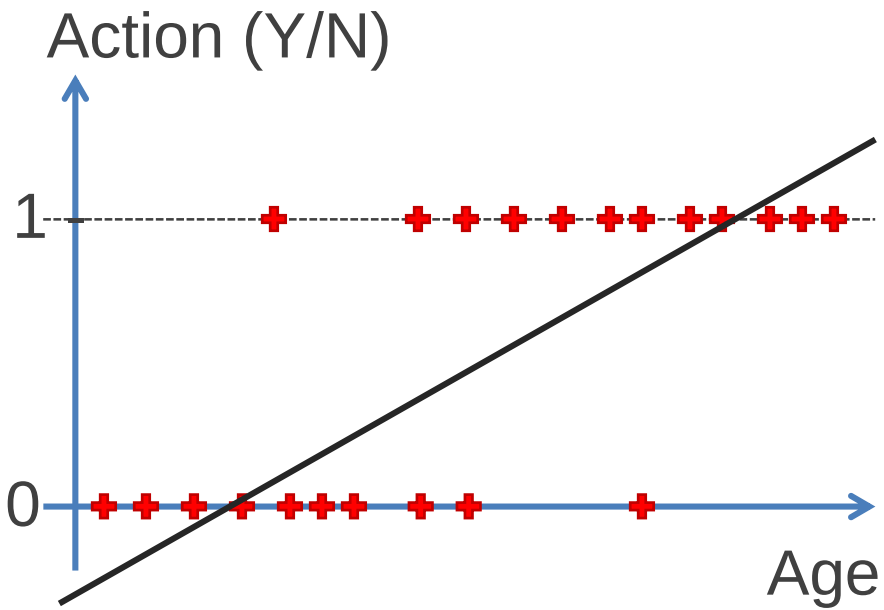
We know this:



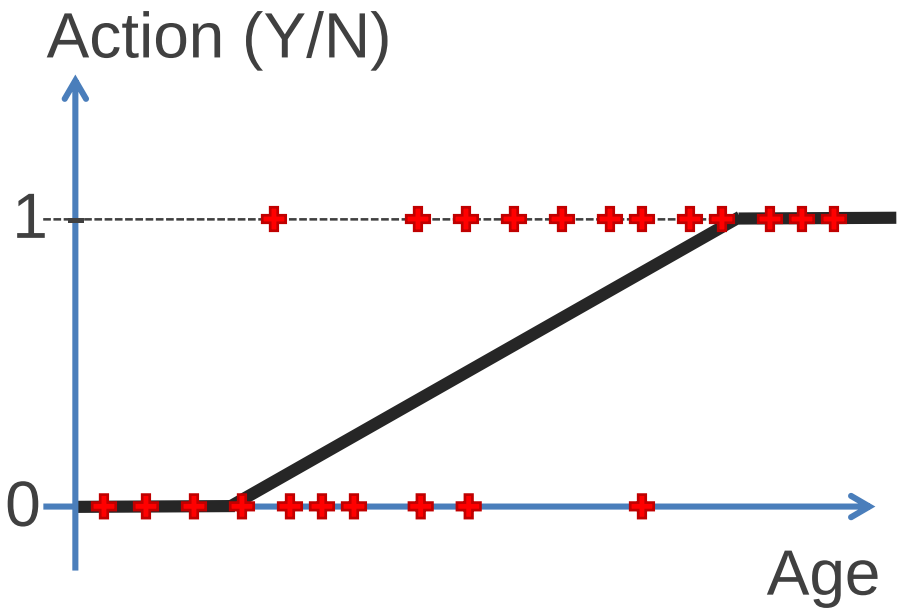
Logistic Regression



Logistic Regression



Logistic Regression



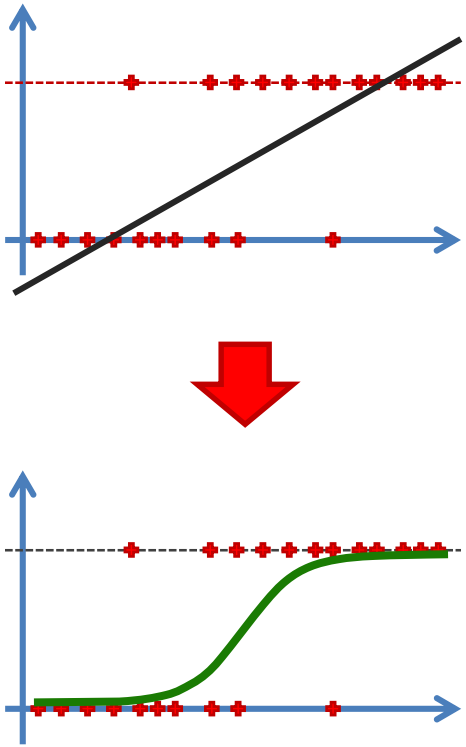
Logistic Regression

$$y = b_0 + b_1 * x$$

Sigmoid Function

$$p = \frac{1}{1 + e^{-y}}$$

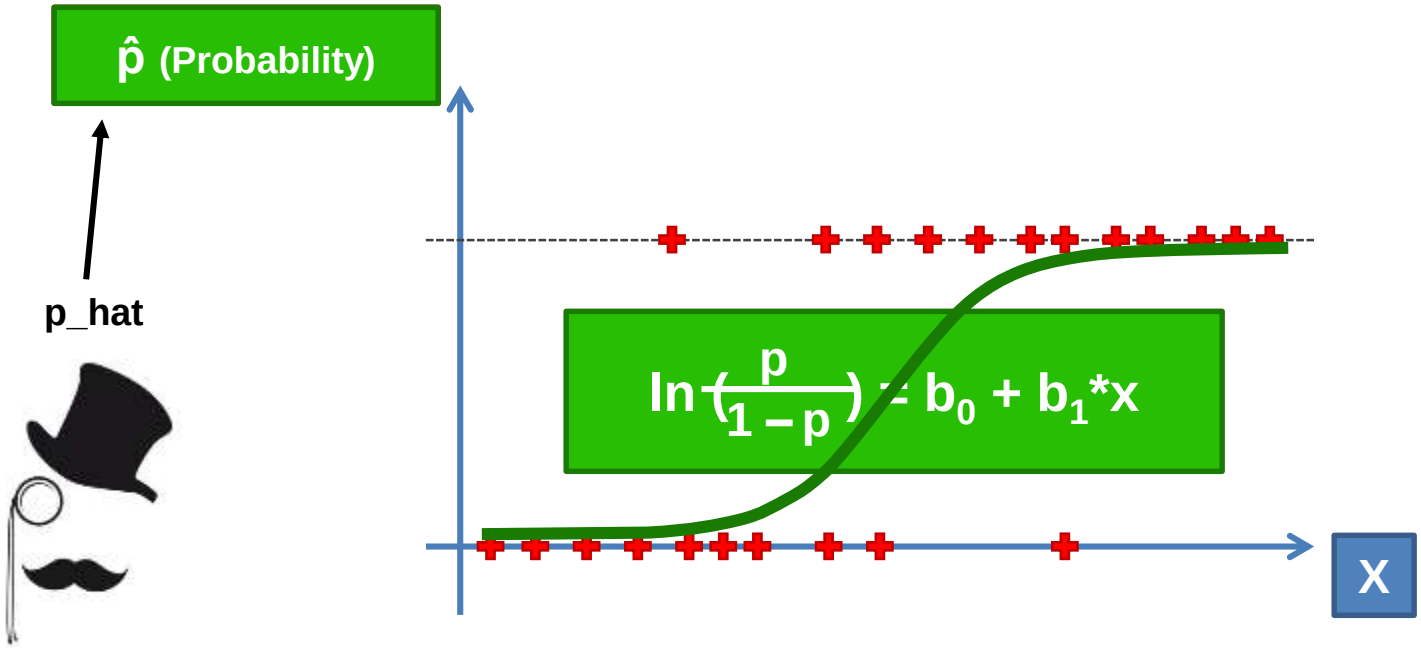
$$\ln\left(\frac{p}{1 - p}\right) = b_0 + b_1 * x$$



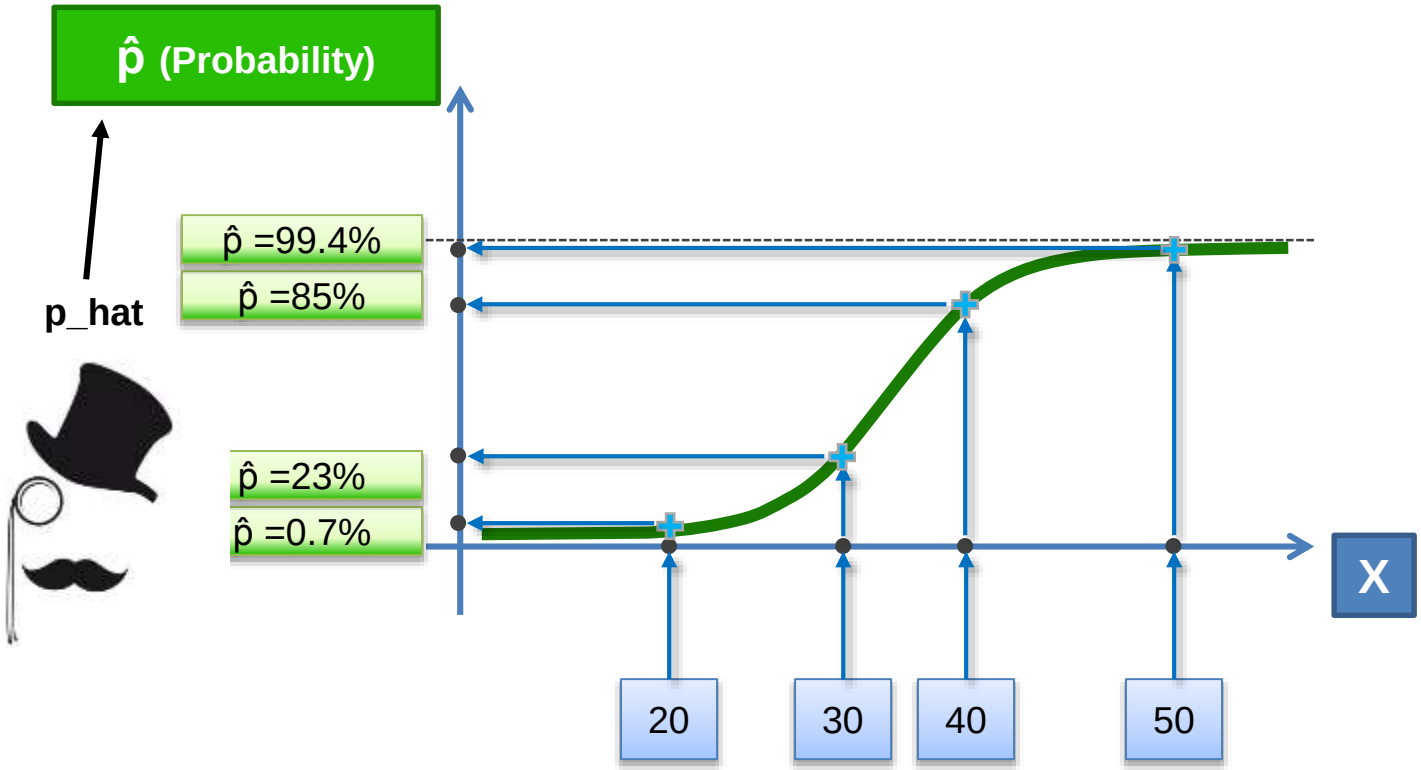
Logistic Regression

WHAT JUST HAPPENED ???

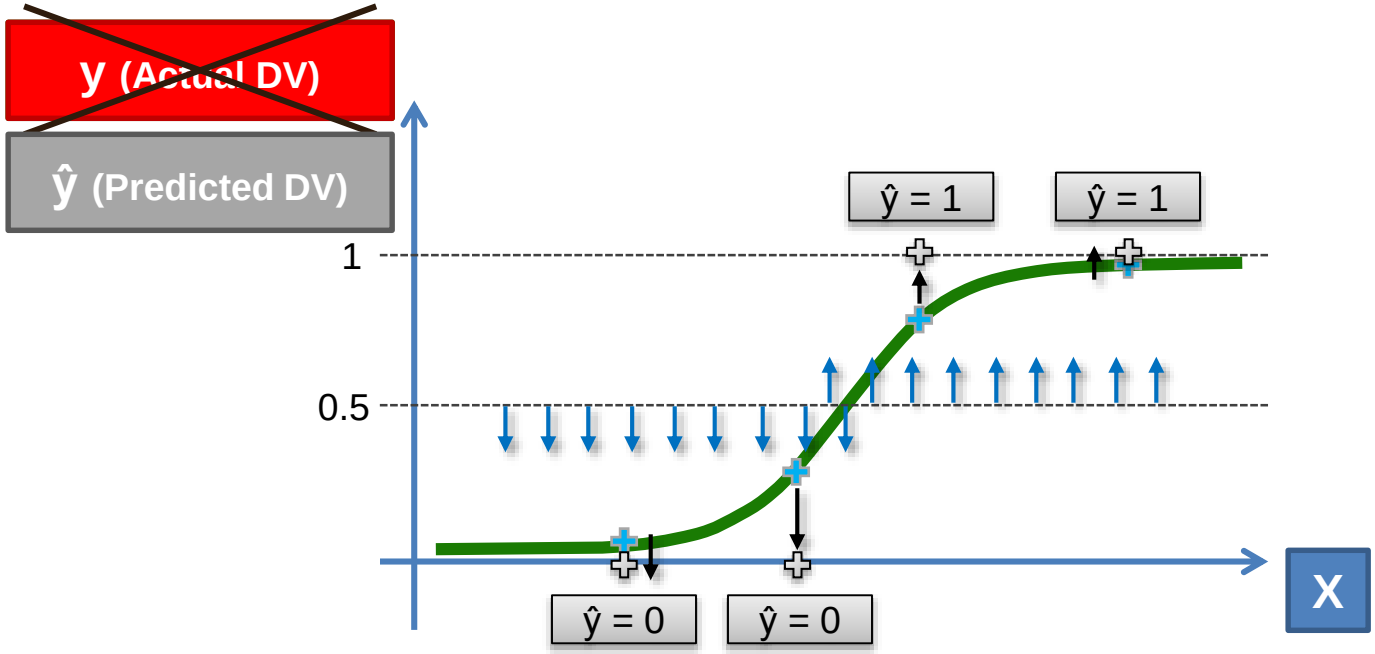
Logistic Regression



Logistic Regression



Logistic Regression



Fin.