Q: Guess the weight?

* Approach 1
  - Feature extraction
  - Feature selection
  - Classifier

Approach 2

$\sum_{i=1}^{n} \frac{1}{n} \text{Loss}(y_i, f(x_i)) + \lambda \|\theta\|_2^2$

$\lambda \to \infty$ $\theta \to 0$

$\lambda \to 0$ $\theta \to \theta_{MLE}$

Regularization

$\lambda_1 (\ldots) + \lambda_2 (\ldots) + \lambda_3 (\ldots) + \ldots \lambda_n (\ldots)$

$\lambda_1 \to \infty$

$\lambda_2 \to \infty$

$\lambda_3 \to \infty$

$\lambda_n \to \infty$

$\lambda_1 \to \infty$

$\lambda_2 \to \infty$

$\lambda_3 \to \infty$

$\lambda_n \to \infty$

$\lambda_1 \to \infty$

$\lambda_2 \to \infty$

$\lambda_3 \to \infty$

$\lambda_n \to \infty$

* Kernel Trick Regularization

$\min_{\theta} \sum_{i=1}^{n} \frac{1}{n} \text{Loss}(y_i, f(x_i)) + \lambda \|\theta\|_2^2$

$\lambda \to \infty$ $\theta \to 0$

$\lambda \to 0$ $\theta \to \theta_{MLE}$

Regularization

$\lambda_1 \to \infty$

$\lambda_2 \to \infty$

$\lambda_3 \to \infty$

$\lambda_n \to \infty$

$\lambda_1 \to \infty$

$\lambda_2 \to \infty$

$\lambda_3 \to \infty$

$\lambda_n \to \infty$

* Kernel Trick / Regularization

$\min_{\theta} \sum_{i=1}^{n} \frac{1}{n} \text{Loss}(y_i, f(x_i)) + \lambda \|\theta\|_2^2$

$\lambda \to \infty$ $\theta \to 0$

$\lambda \to 0$ $\theta \to \theta_{MLE}$