The primal SVM objective is a quadratic program

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primal form of objective:

$$\text{s.t.} \quad \forall i \; y_i\left(\mathbf{w}^T\mathbf{x}_i + b\right) \geq 1$$

$$\min_{\mathbf{w},b} \|\mathbf{w}\|_2^2$$

This can be solved very efficiently using modern quadratic solvers!

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SVM: What if X is not separable w.r.t. y? What about noise?