Lagrange multipliers

Check out the basics of Lagrange multipliers at the corresponding Wikipedia page.

The important things are

1. We can solve a constrained optimization problem of the form $\min_x f(x), s.t. g(x) = 0$ where $g(x)$ is an equality constraint.
2. The constraints can be absorbed into a single objective function, the Lagrangian, which combines the original loss function and the constraints as $\mathcal{L}(x, \lambda) = f(x) - \lambda g(x)$. λ is called a Lagrange multiplier.
3. We solve the constrained optimization problem by computing the partial derivatives $\partial\mathcal{L}/\partial x$ and $\partial\mathcal{L}/\partial\lambda$, setting them to 0 and solving for λ and x.

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