Homework - Double Descent

Q) minimize $\sum_{k=1}^{N} a_k^2$

such that : $\sum_{k=1}^{N} a_k \phi(x; v_k) - y = 0$

⇒ We can minimize a quadratic function given a linear constraint using Quadratic Programming

The given objective function will minimize when each component of it is minimum, i.e. we consider it as a matrix.

we can write given function as,

$$\min f(x) = \frac{1}{2} a^T Q a$$

where $Q = [2]$

KKT conditions

$$\nabla L(a^*, \lambda^*) = \frac{1}{2} a^T Q + \lambda^{*T} \phi(x; v_k)$$

$$a^* \phi(x; v_k) - y = 0$$