$$\hat{\beta} = \left(x^\top x\right)^{-1} x^\top y$$

$$\begin{aligned}
\hat{y}^* &= x^* \hat{\beta} \\
&= x^* \left(x^\top x\right)^{-1} x^\top y \\
&= x^* \frac{\sum_{i=1}^{n} x_i y_i}{\sum_{i=1}^{n} x_i^2} = \sum_{i=1}^{n} \left(x^* \frac{x_i}{\sum_{i=1}^{n} x_i^2} \right) y_i = \sum_{i=1}^{n} \frac{\left(x^* x_i\right)}{K} y_i \quad \left(K = \left(\sum_{i=1}^{n} x_i^2 \right) \right) \\
&= \sum_{i=1}^{n} w\left(x_i, x^*\right) y_i
\end{aligned}$$

$$\hat{y}^* = \sum_{i=1}^{n} \frac{\mathbf{1}\left(x_i \in \mathcal{N}_K\left(x^*\right)\right)}{K} y_i$$