

$$\begin{pmatrix} 1 & 1 & 1 & 0 \\ 1 & 0 & 1 & 0 \end{pmatrix}$$

 \mathbf{X}_1 

$$\begin{pmatrix} 2 & 1 & 2 & 0 \\ . & 1 & 1 & 0 \\ . & . & 2 & 0 \\ . & . & . & 0 \end{pmatrix}$$

 $\mathbf{X}_1^T \mathbf{X}_1$

worker 1

 Σ 

$$\begin{pmatrix} 2 & 1 & 2 & 0 \\ 1 & 1 & 1 & 0 \\ 2 & 1 & 3 & 1 \\ 0 & 0 & 1 & 1 \end{pmatrix}$$

 $\mathbf{X}^T \mathbf{X}$

master

$$\begin{pmatrix} 0 & 0 & 1 & 1 \end{pmatrix}$$

 \mathbf{X}_2 

$$\begin{pmatrix} 0 & 0 & 0 & 0 \\ . & 0 & 0 & 0 \\ . & . & 1 & 1 \\ . & . & . & 1 \end{pmatrix}$$

 $\mathbf{X}_2^T \mathbf{X}_2$

worker 2