

$$\begin{bmatrix}
 1 & x_{11} & \dots & x_{1j} & \dots & x_{1p} \\
 1 & x_{21} & \dots & x_{2j} & \dots & x_{2p} \\
 \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
 1 & x_{i1} & \dots & x_{ij} & \dots & x_{ip} \\
 \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
 1 & x_{n1} & \dots & x_{nj} & \dots & x_{np}
 \end{bmatrix}$$

$\mathbf{x}_{i\cdot}$
 observation i

$\mathbf{x}_{\cdot j}$
 explanatory
 variable j

The diagram shows a data matrix with rows and columns. The first column contains ones. The matrix is enclosed in large square brackets. A red vertical rectangle highlights the column containing $x_{1j}, x_{2j}, \dots, x_{ij}, \dots, x_{nj}$. A red arrow points from the label $\mathbf{x}_{\cdot j}$ explanatory variable j to this column. A cyan horizontal rectangle highlights the row containing $1, x_{i1}, \dots, x_{ij}, \dots, x_{ip}$. A cyan arrow points from the label $\mathbf{x}_{i\cdot}$ observation i to this row. The intersection of these two rectangles is the cell containing x_{ij} .