

$$Y = a + b_1X_1 + b_2X_2 + \dots + b_kX_k + e$$

$$\begin{array}{cccc}
 \mathbf{y} & = & \mathbf{X} & \mathbf{b} + \mathbf{e} \\
 N \times 1 & & N \times (1+k) & (1+k) \times 1 \quad N \times 1
 \end{array}$$

$$\begin{array}{c}
 \boxed{Y_1} \\
 \boxed{Y_2} \\
 \boxed{Y_3} \\
 \boxed{\cdot} \\
 \boxed{\cdot} \\
 \boxed{\cdot} \\
 \boxed{Y_N}
 \end{array}
 =
 \begin{array}{cccccc}
 \boxed{1} & \boxed{X_{11}} & \boxed{X_{12}} & \boxed{X_{13}} & \boxed{\cdot \cdot \cdot} & \boxed{X_{1k}} \\
 \boxed{1} & \boxed{X_{21}} & \boxed{X_{22}} & \boxed{X_{23}} & \boxed{\cdot \cdot \cdot} & \boxed{X_{2k}} \\
 \boxed{1} & \boxed{X_{31}} & \boxed{X_{32}} & \boxed{X_{33}} & \boxed{\cdot \cdot \cdot} & \boxed{X_{3k}} \\
 \boxed{\cdot} & \boxed{\cdot} & \boxed{\cdot} & \boxed{\cdot} & & \boxed{\cdot} \\
 \boxed{\cdot} & \boxed{\cdot} & \boxed{\cdot} & \boxed{\cdot} & & \boxed{\cdot} \\
 \boxed{\cdot} & \boxed{\cdot} & \boxed{\cdot} & \boxed{\cdot} & & \boxed{\cdot} \\
 \boxed{1_N} & \boxed{X_{N1}} & \boxed{X_{N2}} & \boxed{X_{N3}} & \boxed{\cdot \cdot \cdot} & \boxed{X_{Nk}}
 \end{array}
 +
 \begin{array}{c}
 \boxed{a} \\
 \boxed{b_1} \\
 \boxed{b_2} \\
 \boxed{\cdot} \\
 \boxed{\cdot} \\
 \boxed{\cdot} \\
 \boxed{b_k}
 \end{array}
 +
 \begin{array}{c}
 \boxed{e_1} \\
 \boxed{e_2} \\
 \boxed{e_3} \\
 \boxed{\cdot} \\
 \boxed{\cdot} \\
 \boxed{\cdot} \\
 \boxed{e_N}
 \end{array}$$