

$$\begin{array}{ccccccc}
 Y_1 & & Y_2 & & \cdots & & Y_n \\
 g_1 \swarrow & & \downarrow g_2 & & & & \swarrow g_n \\
 X \times X \times \cdots \times X & & & & & & \\
 \downarrow f & & & & & & \\
 X & & & & & & 
 \end{array}$$