Given the coupled system

$$\begin{aligned}
y_1' &= f_1(x,\ y_1,\ y_2,\ y_3) & \text{subject to} \quad & y_1(x_0) = y_{1,0} \\
y_2' &= f_2(\qquad\qquad\qquad) & \text{subject to} \quad & y_2(x_0) = y_{2,0} \\
y_3' &= f_3(\qquad\qquad\qquad) & \text{subject to} \quad & y_3(x_0) = y_{3,0}
\end{aligned}$$

we first calculate

$$\begin{aligned}
k_{1,1} &= h \cdot f_1\,(\,x_j,\ y_{1,j},\ y_{2,j},\ y_{3,j}\,) & \text{where} \quad & y_{1,j} = y_1(x_j) \\
k_{1,2} &= h \cdot f_2\,(\qquad\qquad\qquad\qquad) & \text{where} \quad & y_{2,j} = y_2(x_j) \\
k_{1,3} &= h \cdot f_3\,(\qquad\qquad\qquad\qquad) & \text{where} \quad & y_{3,j} = y_3(x_j)
\end{aligned}$$

then calculate

$$\begin{aligned}
k_{2,1} &= h \cdot f_1\left(x_j + \frac{h}{2},\ y_{1,j} + \frac{k_{1,1}}{2},\ y_{2,j} + \frac{k_{1,2}}{2},\ y_{3,j} + \frac{k_{1,3}}{2}\right) \\
k_{2,2} &= h \cdot f_2\left(\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\right) \\
k_{2,3} &= h \cdot f_3\left(\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\right)
\end{aligned}$$

then

$$\begin{aligned}
k_{3,1} &= h \cdot f_1\left(x_j + \frac{h}{2},\ y_{1,j} + \frac{k_{2,1}}{2},\ y_{2,j} + \frac{k_{2,2}}{2},\ y_{3,j} + \frac{k_{2,3}}{2}\right) \\
k_{3,2} &= h \cdot f_2\left(\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\right) \\
k_{3,3} &= h \cdot f_3\left(\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\right)
\end{aligned}$$

then

$$\begin{aligned}
k_{4,1} &= h \cdot f_1\,(\,x_j + h,\ y_{1,j} + k_{3,1},\ y_{2,j} + k_{3,2},\ y_{3,j} + k_{3,3}\,) \\
k_{4,2} &= h \cdot f_2\,(\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad) \\
k_{4,3} &= h \cdot f_3\,(\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad)
\end{aligned}$$

and finally, we calculate

$$\begin{aligned}
y_{1,j+1} &= y_{1,j} + \frac{1}{6} \cdot (k_{1,1} + 2k_{2,1} + 2k_{3,1} + k_{4,1}\,) \\
y_{2,j+1} &= y_{2,j} + \frac{1}{6} \cdot (k_{1,2} + 2k_{2,2} + 2k_{3,2} + k_{4,2}\,) \\
y_{3,j+1} &= y_{3,j} + \frac{1}{6} \cdot (k_{1,3} + 2k_{2,3} + 2k_{3,3} + k_{4,3}\,)
\end{aligned}$$

to give us the new values for y_1, y_2 and y_3 corresponding to x_{i+1}.