$s_1 = fl(x_1\ y_1) = x_1\ y_1(1+\eta_1)$

$s_2 = fl(s_1 + fl(x_2\ y_2))$

$= [x_1\ y_1(1+\eta_1) + x_2\ y_2\ (1+\eta_2)\ ]\ (1+\varepsilon_2)$

$s_3 = fl(s_2 + fl(x_3 y_3)) = [s_2 + x_3 y_3(1+\eta_3)](1+\varepsilon_3)$
$=$
$[[x_1\ y_1(1+\eta_1) + x_2\ y_2\ (1+\eta_2)\ ]\ (1+\varepsilon_2) + x_3 y_3(1+\eta_3)\ ](1+\varepsilon_3)$

$x1y1\ (1+\eta_1)(1+\varepsilon_2)(1+\varepsilon_3) +$
$x2y2\ (1+\eta_2)(1+\varepsilon_2)(1+\varepsilon_3) +$
$x3y3\ (1+\eta_3)\ ](1+\varepsilon_3)$

for s_n:

$$s_n = \sum_{i=1}^{n} x_i\ y_i\ (1+\eta_i) \prod_{j=i}^{n} (1+\varepsilon_j)$$