

alg

$$s = 0$$

$\leftarrow x_i$

$$s_1 = s_0 + x_1 = f_1(s_0 + x_1)$$

$$s_2 = s_1 + x_2 = f_1(x_1 + x_2)$$

$=$

$$= ((x_1 + x_2)(1 + \delta_2) + x_3)(1 + \delta_3)$$

$$|\delta_2| \leq \epsilon$$
$$|\delta_3| \leq \epsilon$$

$$= 1 + 2\delta$$

$$|\delta'| \leq \epsilon$$

$$s_3 = (x_1 + x_2 + x_3)(1 + 2\delta)$$

$$|\delta| \leq \epsilon$$

$f(s)$ $+ O(\epsilon^2) \quad |\delta| \leq \epsilon$ $f(x) = \text{sum}(x)$

$$\frac{\|x - \tilde{x}\|}{\|x\|} \geq \frac{\|e\|}{\|x\|} = \frac{(n-1)\delta \left\| \begin{pmatrix} 1 \\ \vdots \\ 1 \end{pmatrix} \right\|}{\|x\|}$$

$$\| \cdot \|_2 \Rightarrow \|x - \tilde{x}\| \leq n^2 \epsilon \|x\|$$

↳ "backwards stable" rel err: $C\epsilon$

