$$y[3k] = b_0 \times [3k]$$
$$b_1 \times [3k-1]$$
$$b_2 \times [3k-2]$$
$$b_3 \times [3k-3]$$
$$b_4 \times [3k-4]$$
$$b_5 \times [3k-5]$$
$$b_6 \times [3k-6]$$
$$b_7 \times [3k-7]$$
$$b_8 \times [3k-8]$$
$$b_9 \times [3k-9]$$
$$b_{10} \times [3k-10]$$

$\Longrightarrow$

$$y[3k] = b_0 \times [3k]$$
$$b_1 \times [3(k-1)+2]$$
$$b_2 \times [3(k-1)+1]$$
$$b_3 \times [3(k-1)]$$
$$b_4 \times [3(k-2)+2]$$
$$b_5 \times [3(k-2)+1]$$
$$b_6 \times [3(k-2)]$$
$$b_7 \times [3(k-3)+2]$$
$$b_8 \times [3(k-3)+1]$$
$$b_9 \times [3(k-3)]$$
$$b_{10} \times [3(k-4)+2]$$

$$y[3k+1] = b_0 \times [3k+1]$$
$$b_1 \times [3k]$$
$$b_2 \times [3k-1]$$
$$b_3 \times [3k-2]$$
$$b_4 \times [3k-3]$$
$$b_5 \times [3k-4]$$
$$b_6 \times [3k-5]$$
$$b_7 \times [3k-6]$$
$$b_8 \times [3k-7]$$
$$b_9 \times [3k-8]$$
$$b_{10} \times [3k-9]$$

$\Longrightarrow$

$$y[3k+1] = b_0 \times [3k+1] +$$
$$b_1 \times [3k] +$$
$$b_2 \times [3(k-1)+2] +$$
$$b_3 \times [3(k-1)+1] +$$
$$b_4 \times [3(k-1)] +$$
$$b_5 \times [3(k-2)+2] +$$
$$b_6 \times [3(k-2)+1] +$$
$$b_7 \times [3(k-2)] +$$
$$b_8 \times [3(k-3)+2] +$$
$$b_9 \times [3(k-3)+1] +$$
$$b_{10} \times [3(k-3)] +$$

$$y[3k+2] = b_0 \times [3k+2]$$
$$b_1 \times [3k+1]$$
$$b_2 \times [3k]$$
$$b_3 \times [3k-1]$$
$$b_4 \times [3k-2]$$
$$b_5 \times [3k-3]$$
$$b_6 \times [3k-4]$$
$$b_7 \times [3k-5]$$
$$b_8 \times [3k-6]$$
$$b_9 \times [3k-7]$$
$$b_{10} \times [3k-8]$$

$\Longrightarrow$

$$y[3k+2] = b_0 \times [3k+2] +$$
$$b_1 \times [3k+1] +$$
$$b_2 \times [3k] +$$
$$b_3 \times [3(k-1)+2] +$$
$$b_4 \times [3(k-1)+1] +$$
$$b_5 \times [3(k-1)] +$$
$$b_6 \times [3(k-2)+2] +$$
$$b_7 \times [3(k-2)+1] +$$
$$b_8 \times [3(k-2)] +$$
$$b_9 \times [3(k-3)+2] +$$
$$b_{10} \times [3(k-3)+1] +$$

HW IMPLEMENTATION for $y[3k]$

$\sim\sim$ = ▭ (REGISTER)