VÉGES ÉS VÉGTELEN IMPULZUSVÁLASZÚ SZŰRŐK

FIR: Finite Impulse Response

$$y[n] = \sum_{k=0}^{N} b_k \cdot x[n-k]$$

$$W(z) = \sum_{k=0}^{N} b_k \cdot z^{-k} = b_0 \cdot \prod_{k=1}^{N} \left(1 - c_k \cdot z^{-1}\right)$$

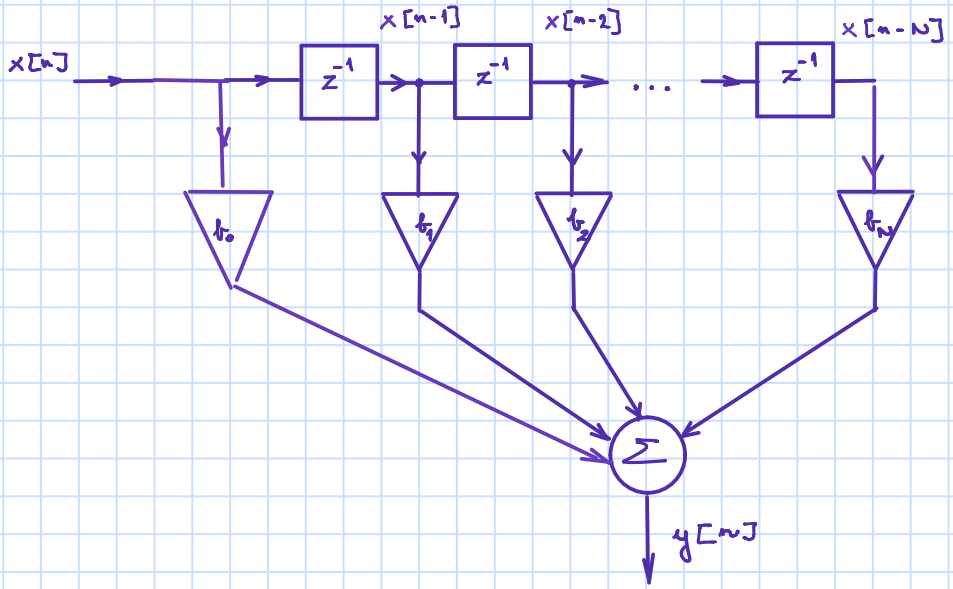
c_k zérusok

pólus $z=0$-ban

↓ inverz z-trf

$$w[n] = \begin{cases} b_n & \text{ha } n \in \{0,1,\dots,N\} \\ 0 & \text{egyébként} \end{cases}$$

VÉGES KONVOLÚCIÓ



IIR: Infinite Impulse Response

$$y[n] = \sum_{k=0}^{N} b_k \cdot x[n-k] - \sum_{k=1}^{M} a_k \, y[n-k]$$

$$W(z) = \frac{\sum_{k=0}^{N} b_k \cdot z^{-k}}{\sum_{k=0}^{M} a_k \cdot z^{-k}} = \frac{b_0 \cdot \prod_{k=1}^{N}\left(1 - c_k \cdot z^{-1}\right)}{\prod_{k=1}^{M}\left(1 - d_k \cdot z^{-1}\right)}$$

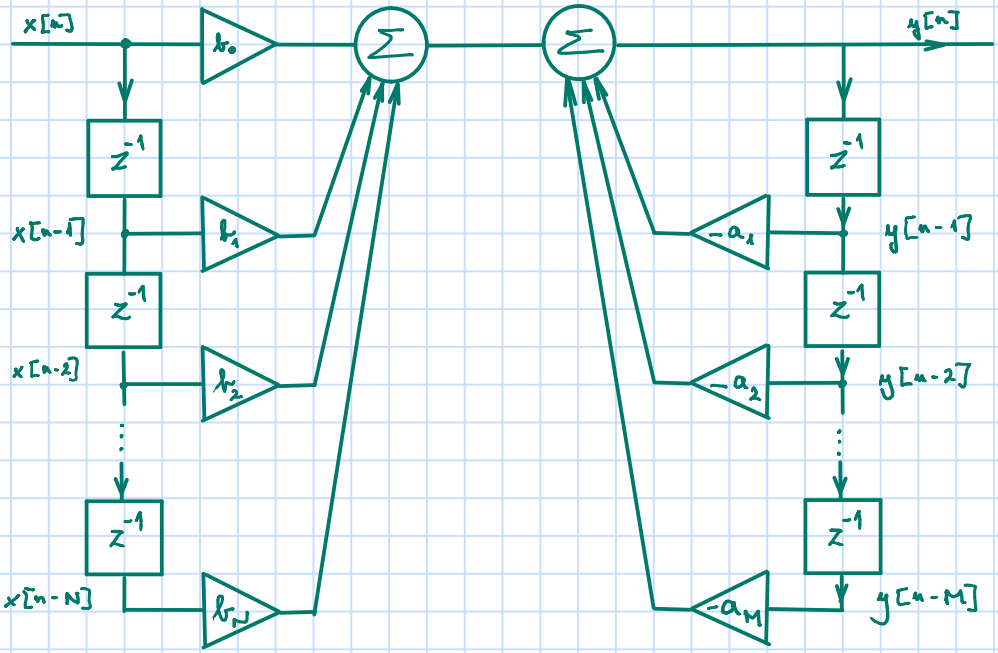
c_k zérusok, d_k pólusok

↓ inverz z-trf

$$w[n] = \sum_{k=1}^{M} A_k \cdot d_k^{n} \cdot u[n]$$

sokkal bonyolultabb

d_k^n — mértani sor



$$y[k] + a_1 y[k-1] + a_2 y[k-2] \dots = b_0 x[k] + b_1 x[k-1] \dots$$