

$$H(z) = \frac{b_0 z^0 + b_1 z^{-1} + b_2 z^{-2} \dots}{1 - (a_1 z^{-1} + a_2 z^{-2} + \dots)}$$

FIR \Rightarrow only zeros.

IIR \Rightarrow poles and zeros

analysis $H(z) \frac{z^3}{z^3} \Rightarrow \frac{\text{polynomial in } z}{\text{polynomial in } z}$ $\leftarrow \begin{matrix} \text{roots} \\ \Rightarrow \text{zeros} \end{matrix}$

$\leftarrow \begin{matrix} \text{roots} \\ \Rightarrow \text{poles} \end{matrix}$

Poles, zeros \Rightarrow coeff.

Stability \Rightarrow poles inside unit circle

