

Zaprojektuj filtr dany równaniem:

$$H(s) = \frac{y(s)}{x(s)} = \frac{1}{T_f s + 1}$$

$$T_f y' + y = u$$

$$x' = \frac{x(k) - x(k-1)}{T_s}$$

$$T_f \frac{y(k) - y(k-1)}{T_s} + y(k) = u(k)$$

$$T_s \leq \frac{T_f}{5}$$

$$y(k)T_f - y(k-1)T_f + y(k)T_s = u(k)T_s$$

$$y(k)(T_f + T_s) = y(k-1)T_f + u(k)T_s$$

$$y(k) = y(k-1) \frac{T_f}{T_f + T_s} + u(k) \frac{T_s}{T_f + T_s}$$

$$a = \frac{T_s}{T_f + T_s}$$

$$y(k) = y(k-1)(1-a) + au(k)$$

