$$G(s) = \begin{bmatrix} \frac{1}{s} & \frac{1}{s(s+1)} \\ \frac{1}{s+1} & \frac{1}{s+1} \end{bmatrix}$$
$q \times m$

rango normale di $G(s)$

$r \leq \min(q, m)$

$G(s)$ ha rango normale pari a 2 ovvero $r=2$

$$G(s) = \frac{1}{d(s)} P(s) = \frac{1}{s(s+1)} \begin{bmatrix} s+1 & 1 \\ s & s \end{bmatrix}$$

$$P(s) \sim S(s) = \begin{bmatrix} \varepsilon_1'(s) & 0 \\ 0 & \varepsilon_2'(s) \end{bmatrix}$$

ALGORITMO X DETERMINARE $S(s)$

$D_0(s) = 1 \qquad D_1(s) = M.C.D \{ s+1, 1, s, s \} = 1$

MINORI DI ORDINE $i=1$

$$D_2(s) = M.C.D \left\{ \begin{vmatrix} s+1 & 1 \\ s & s \end{vmatrix} \right\} = (s+1)s - s = s^2$$

MINORE DI ORDINE $i=2$ ovvero il determinante di $P(s)$

$$\varepsilon_1'(s) = \frac{D_1(s)}{D_0(s)} = 1 \qquad \varepsilon_2'(s) = \frac{D_2(s)}{D_1(s)} = s^2$$

$$G(s) \sim M(s) = \frac{1}{d(s)} \cdot S(s) = \frac{1}{d(s)} \begin{bmatrix} \varepsilon_1'(s) & 0 \\ 0 & \varepsilon_2'(s) \end{bmatrix} = \frac{1}{s(s+1)} \begin{bmatrix} 1 & 0 \\ 0 & s^2 \end{bmatrix}$$

$$= \begin{bmatrix} \frac{\varepsilon_1(s)}{\delta_1(s)} & 0 \\ 0 & \frac{\varepsilon_2(s)}{\delta_2(s)} \end{bmatrix} = \begin{bmatrix} \frac{1}{s(s+1)} & 0 \\ 0 & \frac{s}{s+1} \end{bmatrix}$$

$p(s) = \delta_1(s) \cdot \delta_2(s) = s(s+1)^2$ poli in $s=0 \quad s=-1 \quad s=1$

$z(s) = \varepsilon_1(s)\, \varepsilon_2(s) = s$ zero in $s=0$