Low-Order Cases ($n = 2, 3$)

$n = 2$ $\quad p(s) = s^2 + a_1 s + a_2$

$$\begin{array}{lll} s^2 & : 1 & a_2 \\ s^1 & : a_1 & 0 \\ s^0 : & b_1 & \end{array} \qquad b_1 = -\tfrac{1}{a_1} \det \begin{pmatrix} 1 & a_2 \\ a_1 & 0 \end{pmatrix} = a_2$$

— p is stable iff $a_1, a_2 > 0$ (necessary *and* sufficient).

$n = 3$ $\quad p(s) = s^3 + a_1 s^2 + a_2 s + a_3$

$$\begin{array}{lll} s^3 & : 1 & a_2 \\ s^2 & : a_1 & a_3 \\ s^1 : & b_1 & 0 \\ s^0 : & c_1 & \end{array} \qquad \begin{aligned} b_1 &= -\tfrac{1}{a_1} \det \begin{pmatrix} 1 & a_2 \\ a_1 & a_3 \end{pmatrix} = \tfrac{a_1 a_2 - a_3}{a_1} \\ c_1 &= -\tfrac{1}{b_2} \det \begin{pmatrix} a_1 & a_3 \\ b_1 & 0 \end{pmatrix} = a_3 \end{aligned}$$

— p is stable iff $a_1, a_2, a_3 > 0$ (necc. cond.) and $a_1 a_2 > a_3$