Assignment 2 – program flow

1. Update observer:

$$\hat{x}_e(k|k-1) = A_e\hat{x}_e(k-1|k-2) + B_e u(k-1) + L_e\big(y(k-1) - C_e\hat{x}_e(k-1|k-2)\big)$$

2. Update process :

$$\begin{aligned} x(k) &= Ax(k-1) + Bu(k-1) + B_p d(k) \\ y(k) &= Cx(k) \end{aligned}$$

3. Update steady state target:

$$\begin{bmatrix} I - A & -B \\ HC & 0 \end{bmatrix} \begin{bmatrix} x_s(k) \\ u_s(k) \end{bmatrix} = \begin{bmatrix} B_d\,\hat{d}(k|k-1) \\ z_{sp} - HC_d\,\hat{d}(k|k-1) \end{bmatrix}$$

4. Calculate the control signal:
   - 4.1 $\delta x(k) = \hat{x}(k|k-1) - x_s(k)$
   - 4.2 $\delta u(k) = QP(\delta x(k))$
   - 4.3 $u(k) = \delta u(k) + u_s(k)$