# Predictive Control – Exercise Session 7

**1.** The error between iteration is obtained as:

$$e_{k+1}(t) = r(t) - y_{k+1}(t) = r(t) - G(q)u_{k+1}(t)$$
$$= r(t) - G(q)u_k(t) - G(q)L(q)e_k(t) = (1 - G(q)L(q))e_k(t)$$

The condition for the error not to grow is:

$$|1 - G(e^{i\omega})L(e^{i\omega})| < 1, \quad \forall \omega \in [-\pi, \pi]$$

From the Nyquist-plot results that this is not the case for $L(q) = 1$.