$J = \lim_{T \to \infty} \frac{1}{T} \mathbb{E} \{ \int_0^T \left( \left( \mathbf{x}_t^{\mathsf{T}} \mathbf{Q} \mathbf{x}_t \right) + \left( \mathbf{u}_t^{\mathsf{T}} \mathbf{R} \mathbf{u}_t \right) \right) dt \}$