SSY281 - Model Predictive Control
Micro-Assignment MA05

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Question 1

Explain the meaning of the solution of the Riccati equation in a Kalman filter

The solution of the Ricatti equation gives the covariance of the states prediction and the prediction itself. The smaller the values of P, the more certain is our estimation.

Question 2

What is required for the prediction error covariance to converge to the solution of the ARE?

In order to the prediction error covariance converge to the solution of ARE, (A,C) must be observable and the matrices Q and R be positive definite ($Q, R \succ 0$)

Question 3

Why would you use a Moving-Horizon estimator rather than a Kalman filter?

The most important reason for using a MHE instead of a kalman filter is that MHE is able to introduce constraints in the states variables.