MECH 6v29 - Model Predictive Control
Homework 1

Jonas Wagner
jonas.wagner@utdallas.edu

2023, September 29th

Contents

Problem 1

1a)

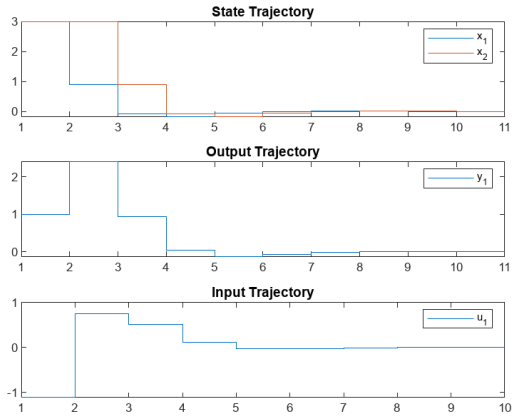

Figure 1: Problem 1a results

The transient behavior is pretty reasonable and has a mild overshoot. The maximum output is around 2.5 (2.409) and it appears to initially reach the origin after 4 timesteps but takes around 7 to settle.

1b)

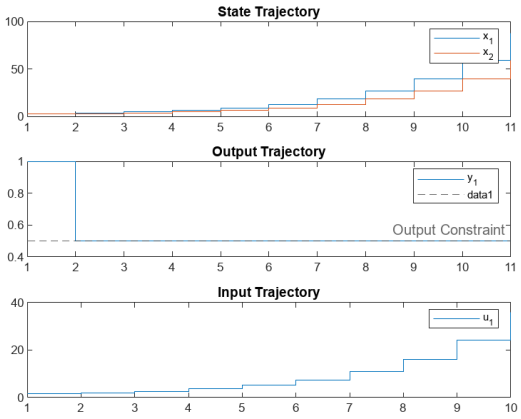

Figure 2: Problem 1b results

The controller is unable to stabilize the system.
Is it possible to tune the cost function matrices? Potentially, although I'm not sure how to explicitly prove this for every case. (Although for this exact initial condition and other parameters I believe taking R = 0 may work)