BOSTON COLLEGE
Department of Economics
EC 316A Advanced Scientific Computation, Prof. Baum, Fall 2003

Problem Set 3
Due at classtime, Thursday 2 Oct 2003

Problem sets should be your own work. Please hand in listings of any MATLAB programs used to generate the answers to these problems.

1. Consider the water management model presented in sections 8.4.4 and 9.7.4. Run the baseline model (demdp10). Evaluate the effects on the optimal solution of assuming that:

a. Farmers derive a ten–fold greater benefit from irrigation than indicated in the baseline reward function.

b. Alternatively, recreational users derive a ten–fold greater benefit from the reservoir than indicated in the baseline reward function.

c. The description of this model discusses a constraint that the reservoir cannot hold more than M units of water, or it overflows. How is this constraint implemented in the baseline solution of the model?

2. Consider the production–adjustment model presented in sections 8.4.6 and 9.7.6. Run the baseline model (demdp12). Evaluate the effects on the optimal solution of assuming that:

a. The cost of adjustment (given by parameter α) was twice as high as in the baseline function;

b. The cost of adjustment did not depend on the squared discrepancy between current and lagged production, but rather on the squared discrepancy between current production and the factory "capacity", q^*. Choose a sensible value for this parameter and demonstrate how the optimal trajectory of production will differ from the baseline model.