

## Discrete & Continuous Modelling • MACM202 • Lab Report #3

- usual lab report format.
- due in the MACM202 box monday (evening) 03 february.
- submit a joint report with your lab partner.
- please heed grading comments from earlier webct discussions.
- be as quantitative & systematic as possible.
- attach the Game Data sheet to the front of your report.

### **Study #1**

- page limit: 2-3 pages typeset (3-4 handwritten) + 1 page annotated graphics (if you can design an effective one).
- play *your* game. Since every group's matrix will be different, each payoff structure will have different strategy implications.
- discussions should address both the game theoretic, as well as the computational optimization aspects of the lab.

### **Study #2**

- page limit: 2-3 pages typeset (3-4 handwritten) + 1 page annotated graphics (if you wish).
- the point here is to describe how well (or not) the algorithm performs.
- include brief overviews of ideas which parallel that of the first study. The new discussions and conclusions to be emphasized here is the effect of increased dimensionality on the performance of the Nelder-Mead algorithm.

7-digit generator:

game matrices:




best value probabilities & A's expected winnings (to 4 significant digits):

**3×3:**

$$\vec{A}_{opt} = \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \quad \max_{\vec{A}} \rightarrow \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$$

$$\vec{B}_{opt} = \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \quad \min_{\vec{B}} \rightarrow \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$$

**4×4:**

$$\vec{A}_{opt} = \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \quad \max_{\vec{A}} \rightarrow \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$$

$$\vec{B}_{opt} = \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \quad \min_{\vec{B}} \rightarrow \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$$

**5×5:**

$$\vec{A}_{opt} = \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \quad \max_{\vec{A}} \rightarrow \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$$

$$\vec{B}_{opt} = \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right] \quad \min_{\vec{B}} \rightarrow \left[ \begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$$