ASSIGNMENT 3

Due October 18, 2005, before 11:00 am

Problem 3

We want to find a minimum of Rosenbrock's function in N-dimensions,

$$f(\mathbf{x}) = \sum_{i=1}^{N-1} \left[100(x_{i+1} - x_i)^2 + (1 - x_i)^2\right].$$

This function clearly has a global minimum at $\mathbf{x}^* = [1 \;\; 1 \cdots 1]^T$ where $f(\mathbf{x}^*) = 0$. Your previous assignment dealt with the $N = 2$ case using conventional optimization methods. You ran into convergence problems if the search point has to turn the corner in order to approach the minimum.

Here you will use differential evolution to find this global minimum. You will need to experiment with finding a good set of DE parameters for this problem. Also experiment with the values of N, $\mathbf{x}_{\text{max}}$ and $\mathbf{x}_{\text{min}}$. You should try $N = 20$, but explore larger values as well. Comment on your numerical findings.

No need to submit a copy of the program for DE. Use the one that I provide at the course website. But submit an electronic copy of your Rosenbrock function.