ME 575
Homework #5, Simulated Annealing
Due Mar 10, 11:50 p.m.

1. Write a Simulated Annealing algorithm in MATLAB. Use the methodology for setting parameters given in Section 5.5.2 of Chapter 5. Besides selecting P_s, P_f, and N (and calculating T_s, T_f, and F) you will need to set the maximum perturbation for the variables. You will also have to determine how many times to perturb the variables each cycle (each perturbation should change both variables).

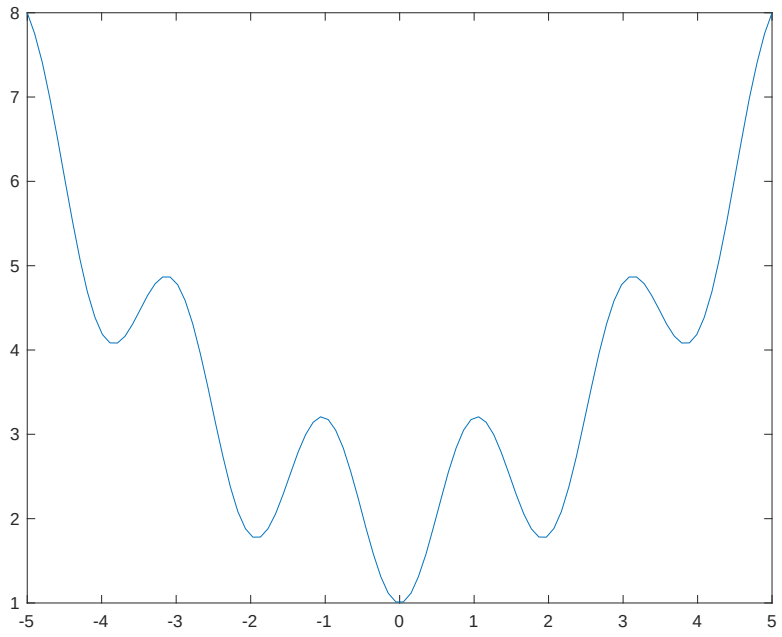
   Turn in a listing of your MATLAB code.

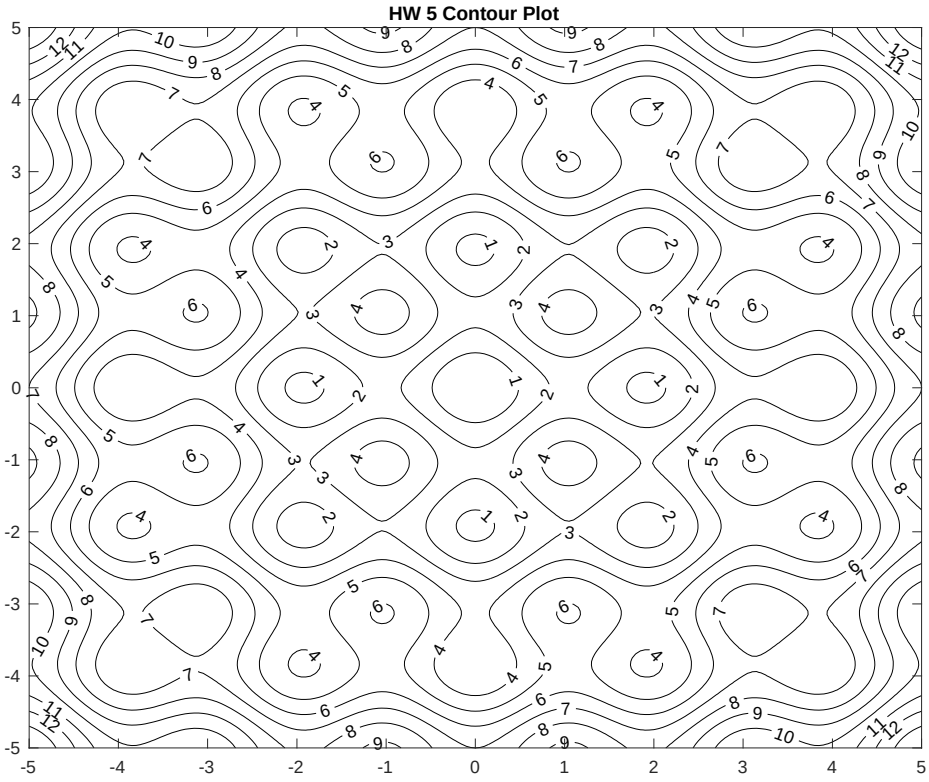
2. Use your algorithm to solve for the global optimum to the following equation (the values for x are in radians.) 1D and 2D (contour) plots are provided.

   $$f = 2. + 0.2x_1^2 + 0.2x_2^2 - \cos(\pi x_1) - \cos(\pi x_2) \text{ with } -5 \le x_1, x_2 \le 5.$$

   Provide a brief discussion on the parameters you chose, the solution, and the performance of the algorithm—was it what you expected? (Base your discussion on at least ten runs from different points.) Discuss how you decided what the maximum perturbation should be. Were you able to tune it so it could reliably solve this problem? How many function evaluations did it take on average to reach (or get close to) the optimum?

   Show the path on a contour plot taken by the algorithm for at least three different starting points.




HW 5 Contour Plot
5
4
3
2
1
0
-1
-2
-3
-4
-5
-5
-4
-3
-2
-1
0
1
2
3
4
5