Upload the e-record for:

Experiment #7: Constrained Optimization using the method of Lagrange's Multipliers

Keep in mind the following points:

- Use different (unique) examples to make your e-record worthy of good grades.
- Do not upload pictures of the monitor screen containing the output instead save the figure in MatLab in an appropriate format and include it in the doc file.
- **The final submission must be in pdf format only.**
- Include the solution of the following problem(s) at the end of the e-record.

Exercise Problem:

1. The highway department is planning to build a picnic area for motorists along a major highway. It is to be rectangular with an area of 5,000 square yards and is to be fenced off on the three sides not adjacent to the highway. What is the least amount of fencing that will be needed to complete the job?
2. Let $f(x,y) = x^2 y^2$ represents the utility function or customer satisfaction derived by a consumer from the consumption of a certain amount of product x and certain amount of product y. Maximize the utility function subject to the constraint $2x + 4y = 40$.
3. Find the dimension of rectangular box with the largest possible volume with an open top and one portion to be constructed from 162 square inches of cardboard. (Note: The amount of the material used in construction of box is $xy + 2xz + 2yz = 162$).
4. An editor has been allotted $60,000 to spend on the development and promotion of a new book. It is estimated that if x thousand dollars is spent on development and y thousand on promotion, approximately $f(x,y) = 20x^{3/2}y$ copies of the book will be sold. How much money should the editor allocate to development and how much to promotion in order to maximize sales?