Name:________________________________ **Assigned: 2016.04.11**

Math 433/833 **Assignment # 6** **Due: 2016.04.19**

0. Read sections 14.1, 14.2, 14.3, and 14.5 in the book.
1. Do problem 2.2(i) on page 489.
2. Do problem 2.2(vii) on page 490.
3. Do problem 5.2 on page 509.

   Notes on this problem:

   (a) It will be helpful to define a vector $\mathbf{w}$ whose components are all equal to 1. Note that the sum of components of a vector $\mathbf{x}$ can then be written as $w^T x$.

   (b) It will also be helpful to express the condition on the sum of x_i^2 as a vector product.

   (c) Note that the Lagrange multiplier rule can be solved for $\mathbf{x}$, which reduces the problem to that of finding the Lagrange multipliers.

   (d) Try taking dot products of the Lagrange multiplier equation with every vector you can think of. These will result in equations from which the Lagrange multipliers can be deduced. The basic idea is that you can eliminate the unknown $\mathbf{x}$ from these equations by using known products of $\mathbf{x}$ with various vectors.

   (e) At some point, you will need to determine whether λ_2 is positive or negative. This will determine which of the extrema you find.

   (f) The final answer is conveniently expressed in terms of the vectors $\mathbf{c}$ and $\mathbf{w}$ and the scalars n and $\bar{c}$, which are the dimension of the problem and the average value of the components of $\mathbf{c}$.