

**CS 591 Numerical Optimization -
Homework #3
Due Oct 18th**

October 3, 2005

- Program CG to solve the following:

$$f(x_1, x_2, x_3) = 3/2*x_1^2 + 2*x_2^2 + 3/2*x_3^2 + x_1*x_3 + 2*x_2*x_3 - 3*x_1 - x_3 \quad (1)$$

Start from $x^0 = [0, 0, 0]$. Try different starting points and discuss performance of the algorithm.

- Using the L-BFGS Algorithm in the book, solve the following problem:

$$f(x) = \sum_{i=1}^{n/2} [\alpha(x_{2i} - x_{2i-1}^2)^2 + (1 - x_{2i-1})^2] \quad (2)$$

with $n = 5$, $n = 10$, $n = 100$, and attempt larger values (within reason) and try different values of m . Set $\alpha = 10$ and try different values. How does the algorithm perform with different values of m and α .