THE UNIVERSITY OF CALGARY
DEPARTMENT OF ELECTRICAL
AND COMPUTER ENGINEERING

ENEL 619.19 Assignment # 2 Fall 2003

Question 1: Matrix Algebra

a.   Solve the following system by back substitution:

x_1	x_2	x_3	x_4	
1	2	0	1	-2
0	-1	-2	1	-1
0	0	-3	1	-5
0	0	0	2	2

b.   Using LU factorization compute the inverse of the following matrices.
If the inverse does not exist find a linear dependence for the set of row
vectors of the matrix and its rank.

$$A = \begin{bmatrix} 0 & 1 & -2 \\ 1 & 0 & -1 \\ 2 & 2 & -6 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 & -1 \\ 2 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$$

Question 2: Modeling Integer Programs

We are given n positive integers $w_1, ..., wn$; and another positive integer w,
called the goal. It is required to find a subset of $\{w_1, ..., w_n\}$ such that the
sum of the elements in the subset is closest to the goal, without exceeding it.
Formulate this problem as a special case of the knapsack problem. when the
set of integers is $\{80, 66, 23, 17, 19, 9, 21, 32\}$, and the goal is 142, write this
formulation and see if you can solve it.