

# 620-261 Introduction to Operations Research

## ASSIGNMENT 6

*Post in boxes by 3.00 pm on Monday 28th April 2008*

1. Use the revised simplex algorithm to solve the following linear program.

$$\text{Maximise } z = 4x_1 + x_2$$

subject to

$$8x_1 + 2x_2 \leq 16$$

$$x_1 + x_2 \leq 12$$

with  $x_1$  and  $x_2$  non-negative.

At each stage, record the sets of indices corresponding to the basic and nonbasic variables, the matrix  $\hat{B}$ , the reduced cost row, the right hand column and any other column that you need to generate.

2. Phase 2 of the simplex algorithm starts off with the tableau

BV	$z$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_6$	$x_7$	b
$x_4$	0	8	6	1	1	0	0	0	48
$x_5$	0	4	2	3/2	0	1	0	0	20
$x_6$	0	2	3/2	1/2	0	0	1	0	8
$x_7$	0	0	1	0	0	0	0	1	5
$z$	1	-60	-30	-20	0	0	0	0	0

After some number of iterations of the simplex algorithm it looks like

BV	$z$	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_6$	$x_7$	b
?	0	?	?	?	1	2	-8	0	?
?	0	?	?	?	0	2	-4	0	?
?	0	?	?	?	0	-1/2	3/2	0	?
?	0	?	?	?	0	0	0	1	?
$z$	1	?	?	?	?	?	?	?	?

Use the revised simplex algorithm to fill in the spaces (show your workings).