T-79.4201 **Autumn 2006**
Search Problems and Algorithms
Tutorial 9, 23 November
Problems

1. Solve the linear relaxation of the following integer program using the geometric view where the optimal value is found in a "corner point" of the polytope defined by the inequations.

$$\begin{aligned}
&\min -x_1 - x_2 \quad \text{s.t.}\\
&2x_1 + 5x_2 \leq 16\\
&6x_1 + 5x_2 \leq 30\\
&x_1 \geq 0\\
&x_2 \geq 0\\
&x_1, x_2 \text{ integers}
\end{aligned}$$

2. Solve the problem above by the branch and bound algorithm using linear relaxation. Select always x_1 as the branching variable when both x_1 and x_2 are fractional.

3. Give the following linear program in the standard form in a Simplex tableau in the diagonalized form corresponding to a basic feasible solution.

$$\begin{aligned}
&\min -5x_1 - 4x_2 \quad \text{s.t.}\\
&6x_1 + 4x_2 \leq 24\\
&x_1 + 2x_2 \leq 6\\
&x_1 - x_2 \geq -1\\
&x_2 \leq 2\\
&x_1 \geq 0\\
&x_2 \geq 0
\end{aligned}$$

4. Solve the problem above using the Simplex algorithm.