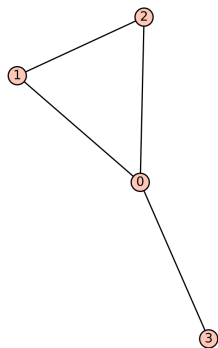


Last name \_\_\_\_\_

First name \_\_\_\_\_

**LARSON—OPER 731—HOMEWORK WORKSHEET 03**  
**Fourier-Motzkin Elimination**



The Vertex Packing Integer Program (VPLP) here is:

maximize:  $z = x_0 + x_1 + x_2 + x_3$

$$\begin{array}{rclcl} & x_0 & + & x_1 & \leq & 1 \\ \text{subject to:} & x_0 & & & + & x_2 & \leq & 1 \\ & & x_1 & + & x_2 & \leq & 1 \\ & x_0 & + & & & + & x_3 & \leq & 1 \\ & x_0, x_1, x_2, x_3 & \in & [0, 1]. \end{array}$$

1. Write an inequality for  $z$ . Call this system (I.).
2. Solve each inequality for  $x_0$ . Write a new system (II.) of inequalities not involving  $x_0$ .
3. Solve each inequality for  $x_1$ . Write a new system (III.) of inequalities not involving  $x_1$ .
4. Solve each inequality for  $x_2$ . Write a new system (IV.) of inequalities not involving  $x_2$ .
5. Solve each inequality for  $x_3$ . Write a new system (V.) of inequalities not involving  $x_3$ .
6. Solve for  $z$ .
7. Use system (IV.) to solve for  $x_3$ .
8. Use system (III.) to solve for  $x_2$ .
9. Use system (II.) to solve for  $x_1$ .
10. Use system (I.) to solve for  $x_0$ .
11. Check that you have a feasible solution, and that it attains the optimal  $z$ .