

## Introduction to Optimization

MS&E 111/ENGR 62, Autumn 2007-2008, Stanford University

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Handout 7: Lab 3. Lab date - 10/19/07

Alice and Bob have \$200,000 in their Investment Retirement Account (IRA) which they need to withdraw over three years. Funds in their IRA earn an annual 10% rate of return and do not get taxed while they are in the IRA. Assume they have an additional fixed income of \$30,000 each year from social security. Assume that IRA withdrawals are made at the beginning of the year and social security is also received in the beginning of the year. Note that all the money will be withdrawn at the beginning of the third year.

a) Alice and Bob would like to maximize the total income over three years. Formulate this as an LP and solve it using Excel.

b) Unfortunately, (for Alice and Bob), their social security and withdrawals from their IRA get taxed as income. Also assume that their tax rate each year is 0% for the first \$40,000, 10% for the next \$40,000, and 25% thereafter (e.g. for \$90,000 the amount of tax is  $.1 * 40,000 + .25 * 10,000$ ).

Alice and Bob would like to maximize the total after tax income over three years. Formulate this as an LP and solve it using Excel.