§3.2 (part 2): Two Variable LP Models

1.] Show & Sell: Show & Sell can advertise its products on local radio and television (TV). The advertising budget is limited to $10,000 a month. Each minute of radio advertising costs $15, and each minute of TV commercials cost $300. Show & Sell likes to advertise on radio at least twice as much as on TV. In the meantime, it is not practical to use more than 400 minutes of radio advertising a month. From past experience, advertising on TV is estimated to be 25 times as effective as on radio. Formulate the LP for Show & Sell.

2.] Day Trader: Day Trader wants to invest a sum of money that would generate an annual yield of at least $10,000. Two stock groups are available: blue chips and high-tech, with average annual yields of 10% and 25%, respectively. Though high-tech stocks provide higher yield, they are more risky, and Trader wants to limit the amount invested in these stocks to no more than 60% of the total investment. What is the minimum amount Trader should invest in each stock group to accomplish the investment goal? Formulate the LP for Day Trader.

3.] Determine the optimal solution to the LP below by sketching the feasible space on the graph provided.

$$\begin{aligned} \text{Minimize:} \quad & z = 6x + 8y \\ \text{Subject to:} \quad & 40x + 10y \geq 2400 \\ & 10x + 15y \geq 2100 \\ & 5x + 15y \geq 1500 \\ & x, y \geq 0 \end{aligned}$$