Math 482 Workshop

Week 3: Linear Programming, Feasible Region, Simplex Method

Instructions. Write clear solutions on your own paper. Show enough work to justify your answers.

Consider the following LP.

$$\begin{aligned} \text{maximize} \quad & z = 4x_1 + 5x_2 \\ \text{subject to} \quad & 14x_1 + 11x_2 \leq 154, \\ & 7x_1 + 16x_2 \leq 112, \\ & x_i \geq 0, \ \forall i \in \{1, 2\} \end{aligned}$$

(a) Draw the feasible region of the given LP.

(b) Write the dictionary for the given LP.

(c) Perform the simplex method using the least subscript method for picking columns. On each iteration, write the Tableau $T^{(i)}$, basis $\beta^{(i)}$, non-basic variables $\pi^{(i)}$, basic solution $\mathbf{x}^{(i)}$, and objective value $z^{(i)}$.

(d) Plot the value of x_1 and x_2 from $\mathbf{x}^{(i)}$ on your drawing from part I.

(e) Repeat (c)-(d) using the most negative method for picking columns.