1. Solve the following linear program using Python and `scipy.optimize.linprog` function. Submit a printout or a screenshot showing your code and the code output.

Find the maximum of the function

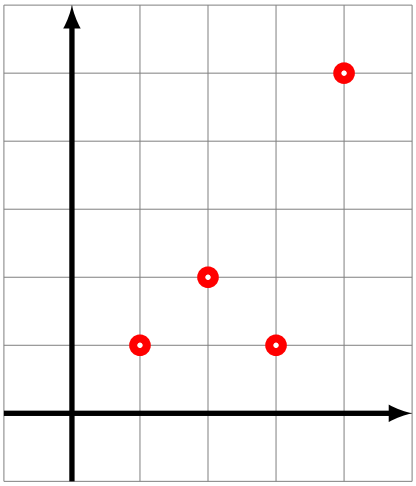
$$z = 5x_1 + 7x_2$$

subject to constraints

$$\begin{aligned} 2x_1 + 3x_2 &\geq 6 \\ 3x_1 - x_2 &\leq 15 \\ -x_1 + x_2 &\leq 4 \\ 2x_1 + 5x_2 &\leq 27 \\ x_1 &\geq 0 \\ x_2 &\geq 0 \end{aligned}$$

2. a) Write a linear program to find an equation of the linear function $f(x) = ax + b$ that best fits the following points in the L_1 sense:

$$(1,1),\ (2,2),\ (3,1),\ (4,5)$$

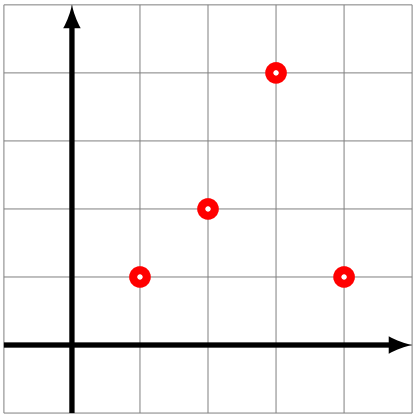


b) Solve this linear problem using `scipy.optimmize.linprog`. Include a printout or a screenshot showing your code and the results of computations.

c) Write the equation of the function $f(x)$ computed in part b) and plot this function together with the points given in part a).

3. **a)** Write a linear program to find an equation of the second degree polynomial $g(x) = ax^2 + bx + c$ that best fits the following points in the L_1 sense:

$$(1, 1),\ (2, 2),\ (3, 4),\ (4, 1)$$



b) Solve this linear problem using `scipy.optimmize.linprog`. Include a printout or a screenshot showing your code and the results of computations.

c) Write the equation of the function $g(x)$ computed in part b) and plot this function together with the points given in part a).