Homework 6 - Quadratic Programming

Problem

[10pt] Solve the following quadratic programming problem using MATLAB.

Minimize
$$f = 3x_1^2 + 2x_2^2 + 5x_3^2 - 4x_1x_2 - 2x_1x_3 - 2x_2x_3$$

Subject to:
$$3x_1 + 5x_2 + 2x_3 \geq 10$$
$$3x_1 + 5x_3 \leq 15$$
$$x_i \geq 0; \ i = 1, 2, 3$$

Show all solving steps:

1. Write standard QP form and show all matrix and vectors.
2. Write KKT conditions and show the linear equations in the form of **BX** = **D**
3. Explain how you calculate the size of **B**, **X**, **D**
4. Apply simplex method and show all iterations (tableau)

Deliverables

1. A MATLAB script that prints all matrices, iterations and the optimal solution.
2. A PDF document that summarizes each of the solving steps with results.

[1pt] Question for bonus credit

Can this problem be solved by directly using the optimality conditions (KKT)? Why?