1. Using your class notes, prepare a 1-2 paragraph summary of what we talked about in class in the last week. I do not want just a bulleted list of topics; I want you to use complete sentences and establish context (Why is what we have learned relevant? How does it connect with other things you have learned here or in other classes?). The more insight you give, the better.

2. Consider the general quadratic programming problem with linear constraints:
\[
\min_x \frac{1}{2} x^T P x + \langle x, q \rangle \quad \text{subject to} \quad Ax \leq b.
\]
We will assume that \( P \) is symmetric positive definite (and so has full rank).

   (a) Find the dual.

   (b) Show how the primal optimal solution \( x^* \) can be computed from the dual optimal solution \( \lambda^* \). (You should be able to convince yourself that both programs have unique solutions.)

   (c) Describe how we can use ADMM to solve the dual problem (in a non-distributed manner, to start). Why is ADMM easier on the dual than the primal?

   (d) Describe how we can write the dual as
\[
\min_{\alpha, \beta} g(\alpha) + h(\beta),
\]
where \( g(\cdot) \) is separable (a sum of individual components of \( \alpha \)) and \( h(\cdot) \) is an indicator of a convex set which we can easily project onto. Write down explicitly how this projection operator works.

   (e) Using your results from part (d), describe how we can use distributed ADMM to solve the dual program.

3. B&V 4.8

5. B&V 4.14
6. B&V 6.3
7. B&V 7.1
8. B&V 7.2