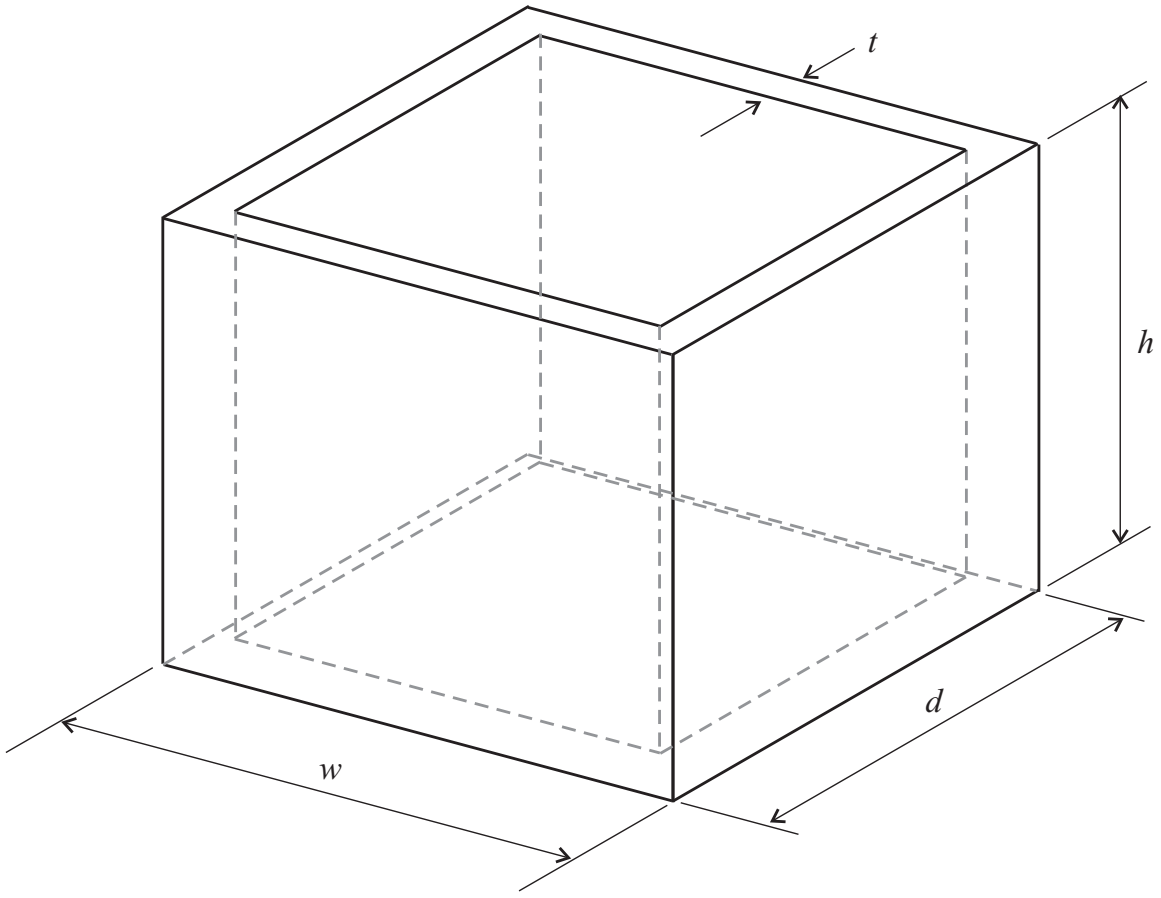
MAE 3195, Credit Sheet 12
Optimization

For this homework, you will design an optimum box. The design parameters of the box are shown in the figure below. All of the box's walls have uniform thickness, $t = 5$ mm. The box is to fit on a 18 inch deep shelf that is only 8 feet long. The distance in between shelves is only 18 inches. The box is made of PVC, and the specific cost (cost per unit mass) of this material is $C =$ \$0.25 per kg. Find the dimensions of the least expensive box that has at least 0.1 m^3 of storage space.



Review Questions

1. What are the design parameters for this design problem?

2. What are the valid ranges for the design parameters?

3. What other constraints are required?

4. What is the objective function?

5. List and describe each feature that you built in Pro/Engineer.

6. List and describe each entry in the Optimization/Feasibility window (Goal, Design Constraints, Design Variables) in Pro/Engineer.

7. What are the dimensions of the optimal box?

8. What is the cost of the optimal box?

9. Would you expect different results from the optimization if you were minimizing the weight of the box? Why?