

1. Assume the production cost  $g(x)$  is convex and the requirements for the next four periods are given by  $r = (2, 5, 1, 4)$ . Find the optimal production plan if  $d = (1, 4, 2, 4)$ ,  $a = (0, -3, 0, 0)$  and  $b = (2, 1, 2, 0)$  when
  - (a)  $I_0 = 0$
  - (b) How would the plan change if  $I_0 = 1$  is required?
  - (c) How would the plan change if  $I_4 = 2$  is required?
2. Solve the capacitated production problem with requirements  $r = (1, 2, 1, 2, 2, 1, 1)$ , capacity  $c = 2$ , and production cost function  $g(x) = 10 + x$  if  $x > 0$  and  $g(0) = 0$ .
3. Use the Wagner-Whitin algorithm to find the minimal production cost if the requirements are given by  $r = (20, 40, 110, 120, 60, 30, 20, 30, 80, 120, 130, 40)$ , the holding cost is  $h = 0.2$  and  $K = 25$ . How does the solution change if  $K = 50$ ? If  $K = 10$ ?