The rental cost depends on which days the contract covers, as shown in the next table.

Days	FSSM	FS	FSS	SS	SSM	Sunday
Rate	119.95	69.95	99.95	74.95	89.95	39.95

Roth Auto Rentals carries only one type of vehicle and expects to have 10 SUVs available for rental over the weekend.

(a) What is the maximum revenue that can be generated from the list of orders?
(b) In the optimal solution of (a), what percentage of customer demand is satisfied?
(c) In the optimal solution of (a), what percentage of dollar demand is satisfied?
(d) Answer the set of three questions above for fleet sizes of 11–16.

6.8 **Allocating Components to Assemblies:** Biking.com is a web-based company that sells bicycles on the Internet. Its distinctive feature is that it allows customers to customize the design when they order and then to receive quick delivery. Biking.com gives customers choices for frame size (34, 36, 38), suspension (standard or heavy-duty), and gear speeds (5, 10, 15). As a result, customers can order one of 18 possible combinations (3×2×3). The company shorthand refers to frame size as Option A (A1 is the 34-in. model, A2 is the 36-in. model, and A3 is the 38-in. model). Similarly, the standard suspension is option B1, and the heavy-duty suspension is B2. The gear speeds are C1 (5), C2 (10), and C3 (15). Rather than stock 18 different types of bicycles, the company holds inventories of the major components and then assembles the bikes once a customer order comes in. Orders are taken Mondays through Wednesdays, assemblies are done on Thursdays, and shipments go out on Fridays. Thus, at the close of business on Wednesday, the company has an inventory of components and a list of orders, and its task is to match components with orders to meet as much demand as possible. The tables below describe customer orders for this week and the inventory status at the end of Wednesday.

Model	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3
B	1	1	1	2	2	2	1	1	1	2	2	2	1	1	1	2	2	2
C	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Orders	4	5	0	5	1	7	0	4	8	1	2	0	5	6	4	0	1	5

Component	A1	A2	A3	B1	B2	C1	C2	C3
Inventory	12	20	30	20	25	18	16	20

(a) What is the maximum number of customer orders that can be satisfied this week?
(b) Suppose that the profitability varies by model type, as shown in the table below. What is the maximum profit that can be achieved from this week's orders?

Model	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Profit	45	55	70	65	75	90	47	57	72	67	77	92	50	60	75	70	80	95

6.9 **The Latin American Soccer Association (Revisited):** Revisit Example 6.6. Suppose that the Latin American Soccer Association (LASA) decides to create a longer playoff schedule. They want each team to play two games against the teams in its own division and one game against each team in the other division. Construct a playoff schedule that maximizes the number of games played by intradivision rivals toward the end of the season.

(a) How many weeks are required for the entire schedule?
(b) How many variables and constraints appear in the optimization model?
(c) What is an optimal schedule for LASA?
(d) Review your schedule in part (c) and determine whether the same two teams ever meet in successive weeks. Amend the model to prohibit such meetings and construct an optimal schedule.

6.10 **One-Dimensional Cutting Stock Problem:** Lumber is supplied to a medium-sized furniture workshop in standard lengths of 100 in. Different designs call for pieces of specified lengths that do not exceed 100 in. Nevertheless, the shop wants to use a minimum number of standard-length master pieces to accommodate a given list of required pieces. Today's list is shown in the table below.

Design	1	2	3	4	5	6	7	8	9	10	11
Length	33	14	63	84	39	94	54	41	50	71	56

(a) Develop a rule of thumb to solve this problem. How many standard-length pieces are needed, using your rule of thumb?
(b) What is the optimal solution? How close did your rule of thumb in (a) come to the optimum?