Lesson 5. Work Scheduling Models

Example 1. Postal employees in Simplexville work for 5 consecutive days, followed by 2 days off, repeated weekly. Below are the minimum number of employees needed for each day of the week:

Day	Employees needed
Monday (1)	7
Tuesday (2)	8
Wednesday (3)	7
Thursday (4)	6
Friday (5)	6
Saturday (6)	4
Sunday (7)	5

Write a linear program that determines the minimum total number of employees needed. You may assume that fractional solutions are acceptable.

Example 2. At the Rusty Knot, tables are set and cleared by runners working 5-hour shifts that start on the hour, from 5am to 10am. Runners in these 5-hour shifts take a mandatory break during the 3rd hour of their shifts. For example, the shift that starts at 9am ends at 2pm, with a break from 11am-12pm. The Rusty Knot pays $7 per hour for the shifts that start at 5am, 6am, and 7am, and $6 per hour for the shifts that start at 8am, 9am, and 10am. Past experience indicates that the following number of runners are needed at each hour of operation:

Hour	Number of runners required
5am-6am	2
6am-7am	3
7am-8am	5
8am-9am	5
9am-10am	4
10am-11am	3
11am-12pm	6
12pm-1pm	4
1pm-2pm	3
2pm-3pm	2

Formulate a linear program that determines a cost-minimizing staffing plan. You may assume that fractional solutions are acceptable.