Chapter 1
Introduction

Case Problem: Scheduling a Golf League

Note to Instructor: This case problem illustrates the value of the rational management science approach. The problem is easy to understand and, at first glance, appears simple. But, most students will have trouble finding a solution. The solution procedure suggested involves decomposing a larger problem into a series of smaller problems that are easier to solve. The case provides students with a good first look at the kinds of problems where management science is applied in practice. The problem is a real one that one of the authors was asked by the Head Professional at Royal Oak Country Club for help with.

Solution: Scheduling problems such as this occur frequently, and are often difficult to solve. The typical approach is to use trial and error. An alternative approach involves breaking the larger problem into a series of smaller problems. We show how this can be done here using what we call the Red, White, and Blue algorithm.

Suppose we break the 18 couples up into 3 divisions, referred to as the Red, White, and Blue divisions. The six couples in the Red division can then be identified as R1, R2, R3, R4, R5, R6; the six couples in the White division can be identified as W1, W2,…, W6; and the six couples in the Blue division can be identified as B1, B2,…, B6. We begin by developing a schedule for the first 5 weeks of the season so that each couple plays every other couple in its own division. This can be done fairly easily by trial and error. Shown below is the first 5-week schedule for the Red division.

Week 1	Week 2	Week 3	Week 4	Week 5
R1 vs. R2	R1 vs. R3	R1 vs. R4	R1 vs. R5	R1 vs. R6
R3 vs. R4	R2 vs. R5	R2 vs. R6	R2 vs. R4	R2 vs. R3
R5 vs. R6	R4 vs. R6	R3 vs. R5	R3 vs. R6	R4 vs. R5

Similar 5-week schedules can be developed for the White and Blue divisions by replacing the R in the above table with a W or a B.

To develop the schedule for the next 3 weeks, we create 3 new six-couple divisions by pairing 3 of the teams in each division with 3 of the teams in another division; for example, (R1, R2, R3, W1, W2, W3), (B1, B2, B3, R4, R5, R6), and (W4, W5, W6, B4, B5, B6). Within each of these new divisions, matches can be scheduled for 3 weeks without any couples playing a couple they have played before. For instance, a 3-week schedule for the first of these divisions is shown below:

Week 6	Week 7	Week 8
R1 vs. W1	R1 vs. W2	R1 vs. W3
R2 vs. W2	R2 vs. W3	R2 vs. W1
R3 vs. W3	R3 vs. W1	R3 vs. W2

A similar 3-week schedule can be easily set up for the other two new divisions. This will provide us with a schedule for the first 8 weeks of the season.

For the final 9 weeks, we continue to create new divisions by pairing 3 teams from the original Red, White and Blue divisions with 3 teams from the other divisions that they have not yet been paired with. Then a 3-week schedule is developed as above. Shown below is a set of divisions for the next 9 weeks.

Weeks 9-11

(R1, R2, R3, W4, W5, W6)	(W1, W2, W3, B1, B2, B3)	(R4, R5, R6, B4, B5, B6)

Weeks 12-14

(R1, R2, R3, B1, B2, B3)	(W1, W2, W3, B4, B5, B6)	(W4, W5, W6, R4, R5, R6)

Weeks 15-17

(R1, R2, R3, B4, B5, B6)	(W1, W2, W3, R4, R5, R6)	(W4, W5, W6, B1, B2, B3)

This Red, White and Blue scheduling procedure provides a schedule with every couple playing every other couple over the 17-week season. If one of the couples should cancel, the schedule can be modified easily. Designate the couple that cancels, say R4, as the Bye couple. Then whichever couple is scheduled to play couple R4 will receive a Bye in that week. With only 17 couples a Bye must be scheduled for one team each week.

This same scheduling procedure can obviously be used for scheduling sports teams and or any other kinds of matches involving 17 or 18 teams. Modifications of the Red, White and Blue algorithm can be employed for 15 or 16 team leagues and other numbers of teams.