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Application/research

**Scheduling**

Ted Williams once said “I think without question the hardest single thing to do in sport is to hit a baseball." Yet it may be even harder to make sure that there are teams at the stadium to play each other in the first place. Scheduling games for a league’s entire season involves meeting many constraints, such as each team having the same number of home games, and not having too many consecutive days off or consecutive days playing.

Graph theory, linear algebra, and integer programming are among the mathematical subjects that make scheduling a season possible and faster. The results are schedules that satisfy fans, players, owners, and broadcasters.

**Let’s construct a schedule for 6 team league.**

Schedule 6 teams in a round robin tournament. Here is a method that **works and generalizes.** Here we number the teams from 1 to n rather than from 0 to n-1.

Consider the case with 6 teams. Construct an initial table with the first half of the teams listed consecutively in the first row and the last half of the teams listed in reverse order in the next row. The teams that line up in the table will play in the first round.

Round 1:

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Next, fix the first team in the cell in the first row and first column but think of all the other teams as being in a necklace on a piece of string listed in the clockwise direction: 2, 3, 4, 5, and 6. Now rotate the necklace one position clockwise and record the entries into a new table: 6, 2, 3, 4, 5. We were thinking of 2 as being at the top of the clock, so after the rotation the last entry in the list is now at the top of the clock.

Round 2:

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|  |  |  |
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Round 3:

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Round 4:

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| --- | --- | --- |
|  |  |  |
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Round 5:

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|  |  |  |
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Any ideas for setting up schedule for 8 teams?

How many rounds are played?

Any ideas how professional sports teams have their schedules made?