SPORTS SCHEDULING

An Introduction to Integer Optimization

15.071x – The Analytics Edge

The Impact of Sports Schedules

- Sports is a $300 billion dollar industry
  - Twice as big as the automobile industry
  - Seven times as big as the movie industry
- TV networks are key to revenue for sports teams
  - $513 million per year for English Premier League soccer
  - $766 million per year for NBA
  - $3 billion per year for NFL
- They pay to have a good schedule of sports games

Sports Schedules

- Good schedules are important for other reasons too
  - Extensive traveling causes player fatigue
  - Ticket sales are better on the weekends
  - Better to play division teams near the end of season

- All competitive sports require schedules
  - **Which pairs** of teams play each other and **when?**

The Traditional Way

- Until recently, schedules mostly constructed by hand
  - Time consuming: with 10 teams, there are over 1 trillion possible schedules (every team plays every other team)
  - Many constraints: television networks, teams, cities, . . .
- For Major League Baseball, a husband and wife team constructed the schedules for 24 years (1981-2005)
  - Used a giant wall of magnets to schedule 2430 games
- Very difficult to add new constraints

Some Interesting Constraints

- In 2008, the owners and TV networks were not the only ones who cared about the schedule
- President Barack Obama and Senator John McCain complained about the schedule
  - National conventions conflicted with game scheduling
- Then, the Pope complained about the schedule!
  - The Pope visited New York on April 20, 2008
  - Mass in Yankee stadium (the traditional location)
- Each of these constraints required a new schedule

An Analytics Approach

- In 1996, "The Sports Scheduling Group" was started
  - Doug Bureman, George Nemhauser, Michael Trick, and Kelly Easton
- They generate schedules using a computer
  - Have been scheduling college sports since 1999
  - Major League Baseball since 2005
- They use optimization
  - Can easily adapt when new constraints are added