

# GROUP PROJECTS

## CASE 13: SCHEDULING

### Airline Crew Scheduling

Rockies Airline is a new airline company that maintains a schedule of two daily flights between Salt Lake City, Denver, and Chicago. Rockies Airline took to the air on February 11, 2004, with the inauguration of service between Denver International Airport and Salt Lake City. Every Rockies Airline aircraft is outfitted with roomy all-leather seats, each equipped with 24 channels of DIRECTV programming.

Rockies Airline must strategically position itself as a low-cost provider in a very volatile industry. Therefore, it must work toward finding a minimum cost assignment of flight crews to a given flight schedule while satisfying restrictions dictated by the Federal Aviation Administration. Rockies Airline needs to solve the crew scheduling problem that is an involved and time-consuming process.

To begin, you will want to figure out all the possible crew rotations. You will want to find an approximate expected cost of each combination and then solve the traditional crew scheduling problem by using these costs. Second, you will want to calculate the crew constraints in order to determine the decision variables, constraints, and objectives.

You have been given Rockies Airline flight schedule as follows:

From:	To:	Departure	Arrival	Departure	Arrival
Salt Lake City	Denver	9:00 a.m.	12:00 p.m.	2:00 p.m.	5:00 p.m.
Salt Lake City	Chicago	10:00 a.m.	2:00 p.m.	3:00 p.m.	7:00 p.m.
Denver	Salt Lake City	8:00 a.m.	11:00 p.m.	2:00 p.m.	5:00 p.m.
Denver	Chicago	9:00 a.m.	11:00 p.m.	3:00 p.m.	5:00 p.m.
Chicago	Salt Lake City	8:00 a.m.	12:00 p.m.	2:00 p.m.	6:00 p.m.
Chicago	Denver	10:00 a.m.	12:00 p.m.	4:00 p.m.	6:00 p.m.

### Some Particulars You Should Know

1. A crew that leaves a city in the morning has to return there at night.
2. The crew can be brought back on another airline. This would always be on an 8 p.m. flight. There are six airplanes in use.
3. When a crew is flying, the cost is \$200 per hour.
4. When a crew is waiting or being flown back, the cost is \$75 per hour.
5. How should the company schedule its crews to minimize cost?
6. *Hint:* You will want to install the Solver add-in to assist with this.
7. File: CREWSCHEDULING.xls (Excel file).