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To illustrate how linear optimization works in revenue management, let us consider a simple example -- a flight from New York to Los Angeles.

In this flight, there are two types of economy fares, Early Bird fares that cost \$238, and Last Minute fares that cost \$617.

In this flight, a Boeing 757 is used that has 166 economy seats.

Demand for these prices has been forecasted using analytics tools, looking at historical data and incorporating models like time series or linear regression.

Clearly, forecasts have errors, and therefore, we need to assess the sensitivity of our decisions to these errors.

To illustrate the use of linear optimization, we assume that demand has already been forecasted.

We'll illustrate how our decisions on how many discount seats to sell vary as the demand forecasts vary.

If the demand for regular seats is 50, and for discounted fares is 150, and the capacity is 166 seats, then the optimal allocation is going to be to sell the 50 seats to satisfy the regular demand, and then we allocate the remaining 116 seats to the discounted fare class.

If the regular demand increases to 100 seats, then we allocate these 100 seats to these customers, and only 66 seats to discounted fare customers.

Finally, if the regular demand increases to 200, then we allocate all of our capacity, 166 seats, to these customers.

While this seems simple, what happens if we have 100 flights with connections in tens of fares?

We'll next see how to formulate the problem mathematically and solve it in a systematic way, using linear optimization.