



# 16: Developing a reliability measure based optimization model for airline crew vacation allocation problem

## Company Name:

Sabre Corporation

## Product:

Travel technology company that distributes software systems for airline bookings.

## The Problem:

The team needs to maximize crew vacation planning using AIMMS and GUROBI as the solver.

## The Solution:

A GUI was built that optimizes the number of vacation days available for a given year

## Team Members:

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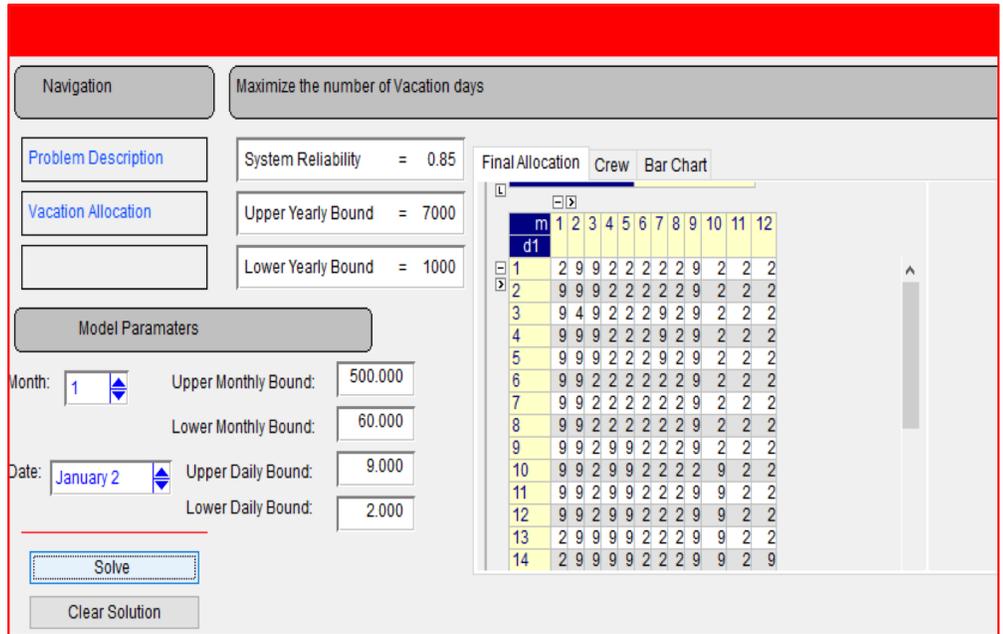
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## Background

Crew costs are the second highest cost for airline companies behind fuel cost. Crew scheduling problems allow for cost reduction opportunities. A given mathematical model has many different constraints that uphold all regulations and account for crew members that are not available due to training, vacation, or absences. The team will use AIMMS to implement the model and create a corresponding Graphic User Interface(GUI).

## The Problem

Crew members want to take vacation around the holidays, leaving a shortage of crew members. A mathematical model needs to be developed to optimize the number of vacation days available each day for a given year, while maximizing crew satisfaction. The model needs to be put into AIMMS optimization software, and use GUROBI as the solver. A Graphic User Interface (GUI) needs to be created inside of AIMMS.

## The Solution

Our project focuses on optimizing crew vacation planning while maintaining employee satisfaction. The model put into AIMMS has many different constraints that maximize the number of vacation days available. A Graphic User Interface(GUI) was created to allow for easy use and to ensure the developer does not have to be worried about the customer accessing the code. Within the GUI the user is able to input crew data and reliability levels to obtain the optimal number of vacation days available for a given year. The user will also see the solution in a pivot table, a chart of the number of crew members available each month and a bar chart of the final allocation. GUROBI is a solver inside of AIMMS that is used to optimize the model. It is the state of the art optimization solver.