

# Rostering Optimization (Strict Seniority PBS)

## Course Description

### *Audience*

This course addresses expert users and developers with a deep understanding of Carmen Crew Rostering who want to understand and control the optimizer for strict seniority problems.

### *Prerequisites*

Rave II, six months of experience using Carmen Crew Rostering.

### *Duration*

3 days

### *Course goals*

The course focuses on five solution methods, Seniority Sequential Initial, Shift Improve, Crew Improve, Sequential Crew Improve and Strict Seniority Improve. After completing the course you will be able to:

- explain the solution methods used by the optimizer
- launch optimization solution methods from Python scripts
- check optimization run time and error messages in the job status report
- explain how different optimization parameters and options affect the optimization process
- adjust optimization parameters to improve performance
- design and program resource, edge-resource and vertical constraints.
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### *Course topics*

- Modelling a rostering problem
- Modelling a strict seniority problem
- Solution strategies, three phases
  - seniority pass  
How to use scripts and parameters to apply the Seniority Sequential Initial method and find the best solution.
  - feasibility pass  
How to use scripts and parameters to apply the Shift Improve method and achieve feasibility.

- improve pass  
How to use scripts and parameters to apply the Crew Improve, Shift Improve and Sequential Crew Improve methods and improve the solution.
- Advanced modelling
  - bid groups
  - additive costs
  - resource constraints
  - edge resource constraints
  - day nodes
  - senior alternates in Seniority Sequential Initial
  - difficult crew in Seniority Sequential Initial
  - Shift Improve – limiting generation to improve performance
  - vertical constraints

All exercises are done using generic flight data and rule sets (Carmen Airlines).