

# Rave for Pairing Optimization

## Course Description

### *Audience*

This course addresses developers with experience of using Carmen Crew Pairing for at least 6 months and a deep understanding of Rave together with the Crew Pairing optimizer.

### *Prerequisites*

Rave II, Pairing Optimization

### *Duration*>

2 days

### *Course goals*

The course gives you a deep understanding of the Rave-Crew Pairing optimizer interaction, specific for Column Generator. After completing the course you will be able to:

- fully understand the rule modelling capabilities of the Column Generator
- carry out a Rave code tuning process

### *Course topics*

The following is already covered to some extent, in previous courses. Here we completely focus on the Column Generator interaction and all performance aspects are pointed out in more detail.

- Generation
  - limitations
  - search width
- Column Generator
  - objectives
  - resources
  - tuning
- Duty network
  - relaxed duty network
- Costs
  - additive
  - non-additive
  - over- and underestimates
  - cost analysis

- Rules
  - trip-length rule and penalty
  - rule violation
  - tighten rules
- Global constraints
  - non-additive global constraint
- Illegal sub-chains
  - performance
  - workaround
- Tuning process
- Tools for analyzing

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