Airline Crew Rostering

Introduction

Airline crew Rostering is an application that solves a simplified version of the airline crew rostering problem by using either the multi-step chicken swarm or the archimedes optimization algorithms. The main application (located in the airlineCrewRostering folder) needs Go version 1.20.1 or later.

Basic Usage

Installation

To install the necessary packages run the “install.py” script from the install folder.

Arguments

There are a number of options to be given to the application such as:

- multiCSO/AOA: Required. Algorithm to be used for the solution of the problem. Must be the first argument given.
- -f, --filename: Required. Relative or absolute path to the input file that contains the pairings.
- --results: Optional. Default value is Output.xlsx. Output file to write the results. Stored in the output subfolder in the airlineCrewRostering folder.
- -p, --pilots: Optional. Default value is 45. Number of pilots.
- --startDate: Optional. Default value is 2001-01-01/00:00. Start date of schedule given in the format year-month-day. Hours and minutes are 00:00.
- --endDate: Optional. Default value is 2021-01-01/00:00. End date of schedule given in the format year-month-day. Hours and minutes are 00:00.
- --seed: Optional. Random number generator seed. If not given, no seed is used.
- --generations: Optional. Default value is 150. Number of iterations of the optimization algorithm.

If multi-step CSO is chosen then the following flags can be given:

- --chickens: Optional. Default value is 20. Number of chickens.
- --FL: Optional. Default value is 0.5. Multi-step CSO algorithm parameter.

If AOA is chosen then the following flags can be given:

- --objects: Optional. Default value is 20. Number of objects.
- --C1, --C2, --C3, --C4: Optional. Default value is 2,6,1,0.5 accordingly. AOA algorithm parameters.

Sample Runs

To run the application open a terminal and go to the airline_crew_rostering folder. Then you can run any of the runs listed below or a custom run using the arguments listed above:

go run airlineCrewRostering.go multiCSO -f Pairings.csv --startDate 2011-11-1 --endDate 2012-3-4 --seed 1528461486438309900 --FL 1.0

go run airlineCrewRostering.go AOA -f Pairings.csv --startDate 2011-11-1 --endDate 2012-3-4 --seed 1158728481045126211 --C1 1 --C2 2 --C3 2 --C4 0.5 --generations 200

go run airlineCrewRostering.go multiCSO -f Pairings.csv --startDate 2011-11-1 --endDate 2012-3-4 --FL 1.5