

## Hands-on Tutorial on Optimization

### Exercise Sheet: Chips Factory

#### Exercise 1 (Basic Structure)

Consider again the chips factory problem.

$$\begin{array}{ll} \max & 2x_p + 1.5x_m \\ \text{s.t.} & 2x_p + 4x_m \leq 345 \\ & 4x_p + 5x_m \leq 480 \\ & 4x_p + 2x_m \leq 330 \\ & x_p, x_m \geq 0 \end{array}$$

Implement the basic structure of your model in CPLEX. This should include

- declaring the variables
- defining the objective function
- giving the constraints
- solving the model

#### Exercise 2 (Add Flexibility)

Increase the flexibility of the model by

- defining a set `c` for the different categories of chips and a set `process` for the different steps that happen during production
- defining an array `price` containing the price for different categories of chips
- defining an array `max_time` indicating the maximum amount of time for a process
- defining a two-dimensional array `time` that contains the required amount of time for the processes
- using aggregators to define the constraints and the objective

#### Exercise 3 (Data Input)

Separate your problem from the data in the following way:

- Move the data from the sets and arrays defined in Exercise 2 to a data file.
- Create a new running configuration including the model and the data files.
- Test your model on the alternative data provided at the homepage.