

Incredible Chairs 3

This problem is really simple: Just change the type of decision variables in the model of the Incredible Chairs assignment.

Problem

- Maximize the profit by optimizing the chair production plan.

Sets

This problem has not sets.

Parameters

In this problem the data is typed directly into the constraints. This is changed in Incredible Chairs 2.

Decision variables

- **Integer** amount of A chairs produced each month m : $x_A \in Z^+$.
- **Integer** amount of B chairs stored each month m : $x_B \in Z^+$.

Model

Objective:

- Total storage costs to be minimized:

$$4 \cdot x_A + 6 \cdot x_B$$

Constraints:

- Production line 1: $2 \cdot x_A \leq 14$
- Production line 2: $3 \cdot x_B \leq 15$
- Production line 3: $4 \cdot x_A + 3 \cdot x_B \leq 35$

This is a very simple change, but the underlying solution method is very different.

The full model in Julia/JuMP, available with the name

`IncredibleChairs3_compact.jl`

from the book web-site, is given below:

```
using JuMP
using HiGHS
IC = Model(HiGHS.Optimizer)

@variable(IC, xA>=0, Int)
@variable(IC, xB>=0, Int)
@objective(IC, Max, 4*xA+6*xB)
@constraint(IC, 2*xA <= 14)
@constraint(IC, 3*xB <= 15)
@constraint(IC, 4*xA+3*xB <= 36)
print(IC)
optimize!(IC)
println("Termination status: $(termination_status(IC))")
if termination_status(IC) == MOI.OPTIMAL
    println("Optimal objective value: $(objective_value(IC))")
    println("xA: ", value(xA))
    println("xB: ", value(xB))
else
    println("No optimal solution available")
end
end
```