CORK INSTITUTE OF TECHNOLOGY
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Computing@CIT

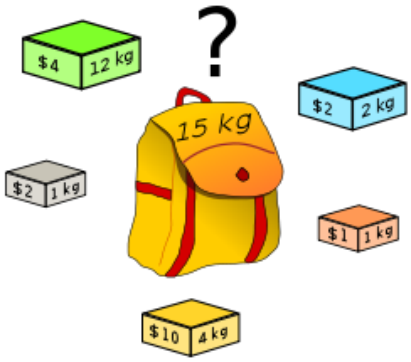
DECISION ANALYTICS.

Lab01: Google OR Tools

BACKGROUND.

In Lecture 2 we looked at the knapsack problem. The goal is to find the most valuable combination of items to pack without exceeding the weight capacity limit. Consider the following specific instance:

- The capacity limit of the knapsack is 15kg
- There are 5 items as depicted in the picture to the right
- Each of the 5 items has a weight and a value printed on the box in the picture to the right



(Remark: The Google OR Tools contain an optimised Knapsack solver for this problem domain. Please do NOT use this dedicated solver for the exercise but use the generic CP-SAT solver instead)

Task 1.

Use the CP-SAT solver to find all feasible solutions to the above knapsack problem, i.e. all possible packing combinations for the 5 items that do not exceed the capacity limit of 15kg (Hint: Use 5 Boolean variables to indicate if an item is in the knapsack or not).

Task 2.

Use the CP-SAT solver to find the optimal solution to the above problem that maximises the value of the items carried in the knapsack without exceeding the 15kg capacity limit.