

# Modelling exercise

Intelligent Systems 1 – BICS 2, 6 May 2020

## 1 BICS Party

We are in 2024 and BICS celebrates its 20 years. You are old! For this occasion, we distribute gift bags. Each gift has a value (how good it seems to be), and a price (how much money it costs). You have a large collection of possible gifts, and you would like to be sure not to exceed the budget per bag. Select a subset of the available gifts, such that the overall value is maximized, while the price does not exceed the budget.

*Note:* This optimization problem is known as the *Knapsack Problem*.

Complete the following model:

```
int: n;  
int: prix_max;  
set of int: N = 1..n;  
array[N] of int: prix;  
array[N] of int: qualite;  
...
```

Test your model on the following data:

```
max_cost = 10;  
n = 5;  
cost = [1, 4, 3, 2, 7];  
value = [1, 3, 2, 3, 4];
```