# Modelling exercise

Problem Solving 1 – MICS 1, 17 November 2021

## 1 MICS Party

We are in 2024 and MICS celebrates its 20 years. You are old! For this occassion, 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: quality;
 ...
```

Test your model on the following data:

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