PROGRAMMING
EXAM 18/1/2018

- **Please write your SURNAME, NAME and ID on ALL sheets**
- **It is forbidden to use books or personal notes**
- **It is forbidden to use electronic devices**
- **It is forbidden to communicate with other students**
- **All code must be commented**

Exercise 1 (max 8 points). Write a recursive function that takes as input an integer value `n` and prints all integers smaller than `n` and multiple of 3, in ascending order.

Exercise 2 (max 8 points). Define the data structures to manage the results of some political elections. The results are stored as a list of candidates which contains, for each candidate, the following information: name, surname, birth year, political party and number of votes.

The number and names of the political parties are known before the election. Note also that name, surname and names of the parties cannot be longer than 10 characters.

Define the appropriate data types; it is forbidden to use the class `string`.

Define the functions to calculate:

(1) name and surname of the youngest candidate
(2) name of the most voted party

Furthermore, define a function `voti_coalizione(...)` that takes as input an array of parties and returns the sum of the votes received by all these parties.

Exercise 3 (max 8 points). Define a class `house` and two subclasses: `flat` and `villa`. All these classes have a constructor that takes as input the number of rooms and the surface area. The constructor of the class `flat` also takes as input the floor.

The class `house` implements a method that takes as input the price per square meter and returns the overall price of the house.

In case of a villa the price is increased by 10%.