Escuela Politécnica de
Ingeniería de Gijón

*Programming Paradigms
and Technologies*

Universidad de Oviedo
Universidá d´Uviéu
University of Oviedo

Escuela Politécnica d'Inxeniería de Xixón
Polytechnic School of Engineering of Gijón

Surname(s): | **Name:**

Exercise 1 *[40%]*

We would like to model a system to weight and charge alimentary products at a local groceries store. In this store, customers put a bag on the scale and fill it with the products they wish to buy. Once they have finished, they generate a label with the price of the bag and close it. Afterwards, they may get a new bag and repeat the process or pay the total amount of all labeled bags. The store sells, among others, almonds, walnuts, and apples. Almonds and walnuts can be put in the same bag, but apples must be in a different one. The system we are modelling can receive the following events:

EVENT	DESCRIPTION
almond(x)	x grams of almonds have been added to the current bag. If there is no bag, a new one is generated with the almonds inside. Only if the current bag contains almonds or walnuts, or a new bag is being generated (at the beginning of the system or immediately after labeling the previous bag) [*].
walnut(x)	x grams of walnuts have been added to the current bag. If there is no bag, a new one is generated with the walnuts inside. Only if the current bag contains almonds or walnuts, or a new bag is being generated [*].
apple(x)	x grams of apples have been added to the current bag. If there is no bag, a new one is generated with the apples inside. Only if the current bag contains apples, or a new bag is being generated [*].
label()	Prints the price of the current bag and closes it (no more elements can be added to the bag). Only if the bag has products inside.
charge()	Print the total amount of the purchase and go back to the initial state. Only if all bags are labelled.

[*] A new bag is generated at the beginning of the system, or after receiving new products immediately after labelling a bag.

You are required to: Design the graph of states of the system, both in graphical and tabular form. In the latter, identify the *actions not allowed* (ANA)*.*

Remarks: Time limit for this exercise: 40 mins. Please hand in only the sheet with the answers and keep this page until the end of the exam, when you will be asked to hand in all the exercise pages.