

1. Given a list of sublists find the sum of each sublist

eg: ((1 2 3) (4 3 1 5) (2 0) (3 4 5) (2 3 0 0 0)) Output: (6 13 2 12 5)

2. Write a main function which computes the XOR of all elements in a list of bits. That is, for example, Given $L = \{1\ 0\ 1\ 0\ 0\ \dots\}$ find $1\ \text{XOR}\ 0\ \text{XOR}\ 1\ \text{XOR}\ 0\ \text{XOR}\ 0\ \dots$

3. Given a list of marks find the no of students above class average and percentage of students above class average also.

4. you are given a list of records of people in a region. the record contains name and date of birth. date of birth contains date, month and year as usual. compute % of people with age 18 or above as on today. you are supposed to check the validity of date. assume february is of 28 days to remove complication of leap year.

5. You are given a list of records of people in a region. Each record contains the name and date of birth of the corresponding person. The date of birth entries contain the date, month and year, as usual.

Output a list whose each item is a list containing the names of the people who have the same birthday.

You are supposed to check whether the dates given are valid.

Use procedural abstraction to identify logical, independent sub-functions and provide the specifications for each of them.

6. You are required to simulate the activity in a queue at a reservation counter over a period of 5 minutes, starting at 8:00 AM. The counter operates in such a way that, at the end of every minute, a customer gets processed. The various customers approach the counter at the following times (in HH:MM:SS):

Customer Alice at 08:00:32 AM

Customer Bob at 08:02:17 AM

Customer Charlie at 08:02:51 AM

Customer David at 08:03:34 AM

Customer Eve at 08:04:11 AM

Customer Frank at 08:04:27 AM

Customer George at 08:04:38 AM

Output the final status of the queue. Use procedural abstraction to identify logical, independent sub-functions and provide the specifications for each of them.

7. Given a well formed non-empty list of items - each item being a list containing the name of an individual and his/her birth-date - we would like to get the name of the eldest. The birth-dates are three member lists where each member is an integer corresponding to: the date (1..31), month (1..12), and year (1 . . .) in that order. Sample Input : '((ravi (12 12 12)) (ashu (11 11 191)) (mini (1 1 1911)))
Output : ravi

You should write functions for each of the identified subtasks - like one for input date validation (do assume that there are no leap years - (29 02 2012) is therefore invalid), a function to compare two items to return the elder of the two, etc. You should not use imperative constructs like let, set, begin, list-ref etc. For every function you write, give its specification (input and output) as a one line comment above that function. You should specify the function which should be called first by naming it as main - this function should strictly follow the input-output specification given in the question.

8. Nitish Kumar (Roll No.: ?) got an S grade in the Programming Laboratory and quite happy about it, he decides to host a dinner party for his close friends. After going through his friends's choices for the different restaurants, he decides that it is better to cook the dinner. He comes with a menu and correspondingly a list of items (LOI - containing the item names and the required amounts in kg.) which need to be purchased for making those items in the menu. Being a bit of a miser and quite unaware of the price trends in Kattangal, he also prepares a price-limit list (PLL - containing the item names and the limit price) which contains the maximum price he is willing to pay for a kilogram of a particular item. Note that for some essential items, there may not be any limit price. Once he reaches the Triveni store in Kattangal, he gets the shop price list (SPP - containing the price per kg. of each of the items in LOI) and proceeds to buy the items. Given LOI, PLL and SPP, provide a bill of items as output which contains the item name, quantity bought, unit price and item's total amount for each of the items which Nitish has bought. The last entry in the list needs to be total number of items bought and total amount to be paid.

