INFO216
Imperative Programming II

Session2 09.10
Wed. 8 Sep. am
Duration: 2 hours

Lebanese University
Faculty of Sciences 1

Four full marks will be subtracted in case of the bad presentation of the answer sheet.

Exercise I (13pts)

Consider a singly-linked list listCar that you want to change by replacing one or more of its elements. It uses a second singly-linked ordered list listPos to indicate the position of elements to be replaced in the starting list.
Example :

  listCar contains [a, h, o, a, v, r, k, w, y, j, l]
  listPos contains [2, 5, 7, 9, 10]

The call replace (listCar, listPos, 'H') must modify listCar that becomes: [a, h, H, a, v, H, k, H, y, H, H], that is to say that we replace the elements at positions 2, 5, 7, 9 and 10 by the character H.

1. Write the function replace.

Exercise II (15pts)

On a server machine, there is a file connexion.dat containing for each connected PC, its name and IP address (network address). The IP address is a string of 12 characters (and not an integer) while the name is a string of 20 characters. In another file autorisation.dat was stored the names of the PCs that have access permission to the printer.

2. Provide the necessary declarations for the above files.
3. Write a function that displays the names of the PCs with no permission to access the printer.
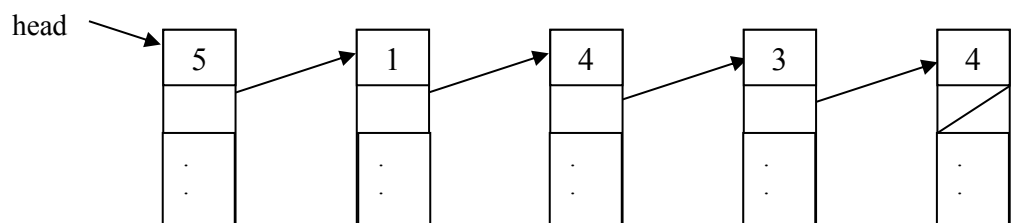
Exercise III (25pts)

An MxN sparse matrix is a matrix of integers that most elements are zero and which do not contain rows and columns completely void. Such a matrix can be represented by a list consisting solely of non-zero matrix elements traversed line by line. Example:

This matrix: becomes:

4. Give the declaration of the data structure to use.
5. Write a function that returns the dimensions (M and N) of a given sparse matrix.
6. Write a function that calculates the sum of two sparse matrices.

The End