Université Mohammed VI Polytechnique **Année 2020-2021**
Licence LSD **Structures de données**

TRAVAUX PRATIQUES
SÉRIE II

Exercice 1. *Flood fill is an algorithm mainly used to determine a bounded area connected to a given node in a multi-dimensional array. It is a close resemblance to the bucket tool in paint programs.*
To perform a "flood fill", consider the starting point, plus any points connected 4-directionally to the starting point of the same color as the starting point, plus any points connected 4-directionally to those points (also with the same color as the starting point), and so on. Replace the color of all of the aforementioned points with the newColor.
write a program that take an array from the user and apply the flood fill algorithm, following these steps below.

1. *get two integers from user that represent the dimension of the 2d array, and store them in a struct called* `t_point`.
2. *create a function that take a* `t_point` *dimension and return an allocated array.*
3. *get the array inputs from the user and store them in the allocated array.*
4. *get the position from user where we need to apply flood fil algorithm, and store it inside a* `t_point` *type.*
5. *Create a function called* `flood_fill` *that take* `char**` *array,* `t_point` *position and* `t_point` *dimension, then apply the flood fill alogorithm.*
6. *print the result.*

Exercice 2. *In this exercise, we will implement the most function used by a linked list data-structure.*

- *Create a singly linked list called t_list, that holds integer data and the reference to the next node.*
- *Create these functions:*
  - `create_node`*: allocate and return a new node.*
  - `add_node`*: add a node to the end of the list.*
  - `array_to_list`*: take as an argument an array and copy its element to a new list.*
  - `print_list`*: take as an argument a list and print its elements.*
  - `remove_node`*: take as argument node address and remove it from the list.*

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