**Université Mohammed VI Polytechnique** **Year 2020-2021**
**Licence LSD** **Data Structures**

# PRACTICE SESSION
## SESSION III

**Exercice 1.** *A palindrome is a string that reads the same backward as forward, for example strings "z", "aaa", "aba", "abccba" are palindromes, but strings "datascience", "reality", "ab" are not.*
*In this exercise you will implement a program that take a string from the user (using the command line arguments) and check if it's a Palindrome using two data structures arrays and a linked list, then we will benchmark.*

1. *Get the string to evaluate from the user using the command line arguments.*
2. *Convert the string to a linked list.*
3. *Create a function that take a list of characters and return* `true` *if the string in the linked list is a* `Palindrome` *otherwise* `false`*.*
4. *Calculate the complexity of your function.*
5. *Now, find another way to get the check Palindrome in O(n / 2).*

**Exercice 2.** *Linked list:*

1. *Create 2 linked list with random values (100 nodes, 30 nodes).*
2. *Create a function called* `sort_list` *then use this function to sort the two linked lists.*
3. *Create a function called* `merge_lists`*, to merge your linked lists into one list.*
4. *Create a function called remove duplicated, then use this function to remove duplicated values from the resulted list.*
5. *Print the result.*
6. *Recreate the same exercise using arrays instead of lists, and compare the time of execution of the two data structures.*

*Date*: April 2, 2021.