TP 19: Tree data structure

- The objective of this Lab is
  - To practice implementing tree data structure in C++ language
- Individual work
- Submit to MS Team
  - *Source codes (No need to zip. Each file name is: YourNameTP19_problem##)*

---

1. Implement a binary search tree to store information of students. Each student has firstname, lastname, student ID, year, major, gender and phone number. When insert data into tree, student ID is taken as the main key for comparison whether to insert data to left or right of tree.

    a. Add 10 info of your friends to the tree.
    b. Display data using inorder traversal.
    c. Search for a student based on his/her student ID. Ask a user for the student ID then search and show result.

2. Write two programs to compare its performance. One program using array data structure and another program using tree data structure. Random 1000 numbers (ranging from 1 to 1000) and store those number in a file numberRandom.txt . Next create an array that can store up to 1000 numbers, and create a binary search tree. Read numbers from the file numberRandom.txt and add those numbers to the array and the tree (if the number is duplicate, let add it to the right of the tree).

a- Display data in array. Display data in the tree using inorder traversal.
b- Search for the number 50. Then compare the execution time. Similarly, repeat the search for the number 100, 150, and 200.