

Mila University Center

Institute of Science and Technology
2nd^{year} LMD computer science
Module: ASDD 3
Year: 2024-2025

Mini-Project Binary search tree (4 weeks)

A pharmaceutical laboratory has decided to automate the management of information on the drugs it produces by leveraging dynamic data structures. To achieve this, a binary search tree (BST) will be used, where each node represents a drug. This approach ensures efficient search, insertion, and deletion operations based on a drug's unique identifier (an integer). Each drug is characterized by the following attributes: a unique number (integer), a label (character string), a unit price (real), a category (character string), and a linked list of product (name and quantity) required for its manufacture.

Work requested:

Develop a C++ program that should allow, from a menu, to :

Part 1:

- 1) Enter the information (number, label, price, and category) of a drug and insert it into the drug tree.
- 2) Fill in the list of products that make up a drug identified by its number. If the drug does not exist in the tree, the program must display an error message.
- 3) Display drugs produced by the laboratory (display of drug labels)
- 4) Search for a drug by its unique number and display its main information along with the list of products required for its composition.

Part 2:

- 1) Delete a drug identified by its number from the drug tree.
- 2) Remove a product, identified by its name, from the list of products required to compose a drug, identified by its unique number.
- 3) Search for and display all drugs that contain a product identified by its name.
- 4) Replace one product with another in all the lists of products used to compose the laboratory's drugs.

Part 3:

- 1) Display the laboratory's drug categories.
- 2) Visualize the drug tree organized by category

Part 4: Additional

- 3) Implement a feature to save the drug tree to a file.
- 4) Add a functionality to delete all drugs within a specified category.