ĐẠI HỌC
BÁCH KHOA HÀ NỘI
HANOI UNIVERSITY
OF SCIENCE AND TECHNOLOGY

BÁO CÁO MINI PROJECT MÔN LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

Team 21 Topic 1: Visualization of operations on tree data structures

Team members and assignment:

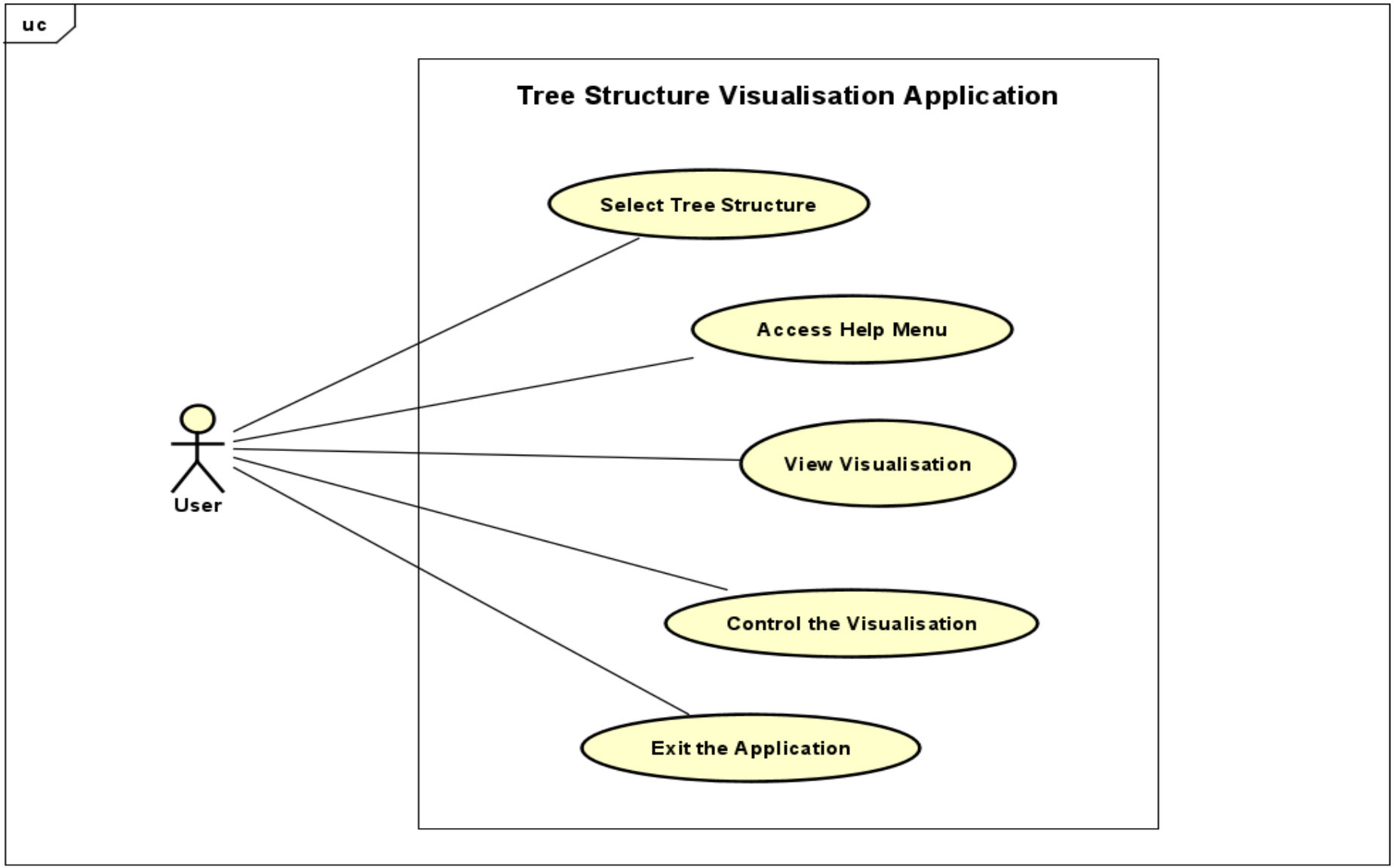
1. Lê Quang Minh 20215088 (Leader): Everything
2. Nguyễn Phúc Mạnh 20215087: Nothing
3. Đoàn Quang Minh 20210606: Nothing
4. Hoàng Nhật Minh 20210607: Nothing

ONE LOVE. ONE FUTURE.

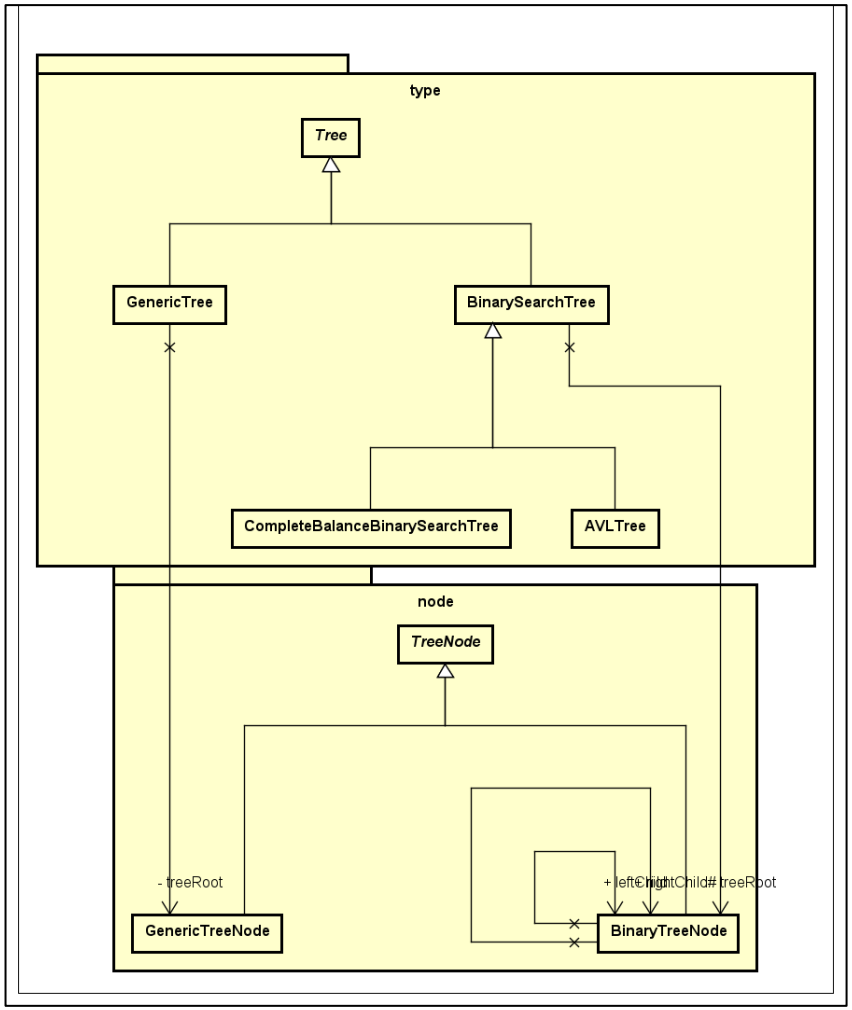
Problem statement

- Tree data structures are interesting and useful, yet not many students can study tree structures that well.
- A tree visualization application can help with that
- Demonstrate step by step of many operations of many types of tree.

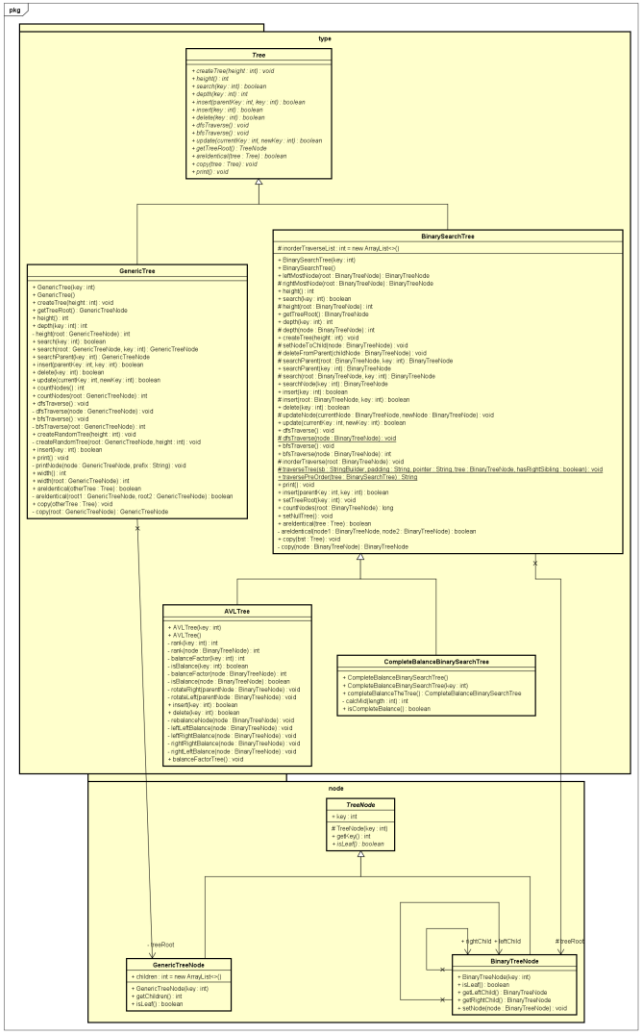
Use case diagram



General class diagram



Class diagrams for packages/modules



Inheritance/Encapsulation

- Inheritance:
  - Tree nodes:
    - GenericTreeNode, BinaryTreeNode inherit abstract TreeNode.
  - Tree types:
    - GenericTree, BinarySearchTree inherit abstract Tree
    - AVLTree, CBBST inherit BinarySearchTree.
- Encapsulation:
  - Each class has its own private/protected value and needs method to access.

Abstraction/Polymorphism/Interface

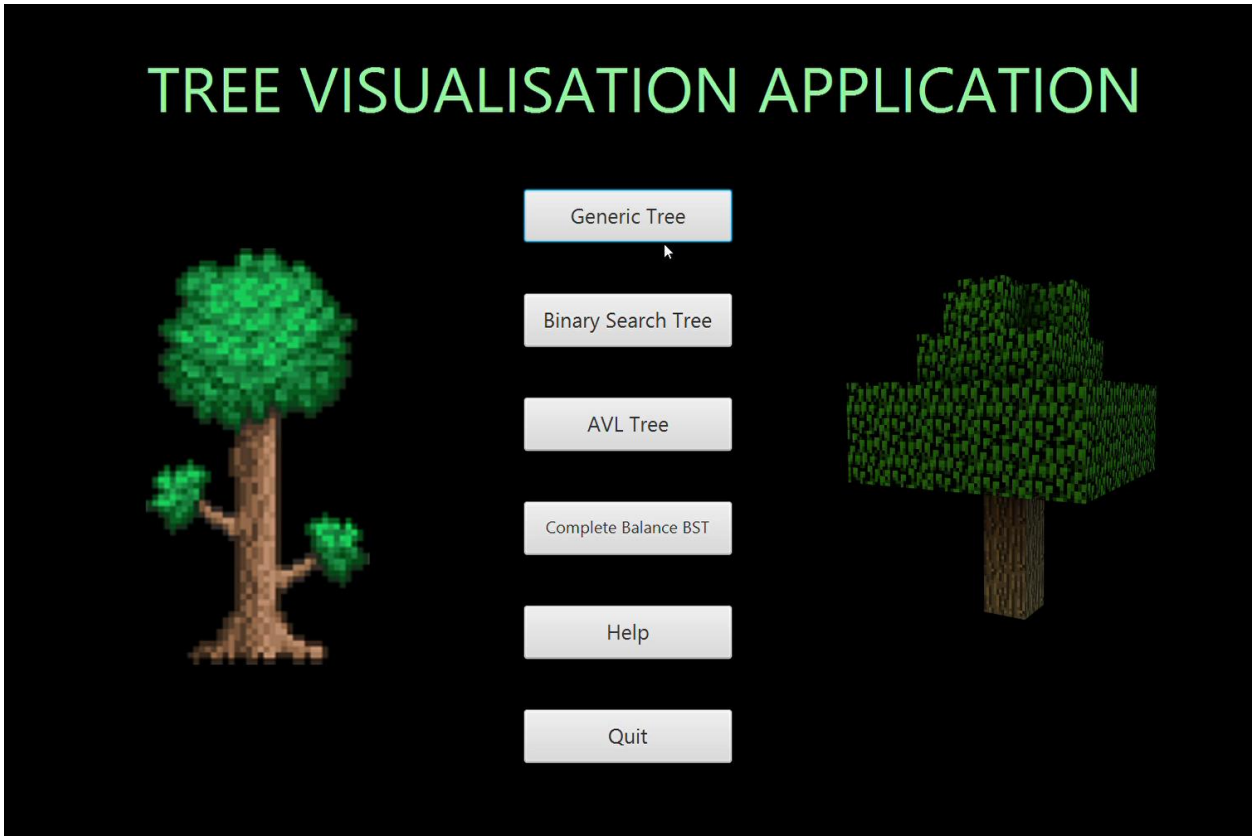
- Abstract Tree, TreeNode class.
- Polymorphism: Using Tree as a base for other Tree classes in the controller.
- Interface: No.

Relationships

- GenericTree contains GenericTreeNode (Aggregation)
- BinarySearchTree, AVLTree, CBBST contain BinaryTreeNode (Aggregation)

Demo scenario

- Link video



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THANK YOU !