

Binary Tree

Major: Mathematics(수학과)

Student ID: 202021224

Name: 주민찬

Implement a binary tree and submit it with the code.

However, because the binary tree is a complete binary tree or a full binary tree, I think it can be implemented as an array.

It is also implemented as a thread linked list and submitted together.

tree.c : array implementation

tree2.c thread linked list implementation

```
Binary tree functions: Select the function you like to proceed with,
  1. Insert root
  2. Insert left
  3. Insert right
  4. Inorder Successor
  5. Inorder Traversal
  6. Terminate Program
Selection choice: 1
Enter the root node information: 0
The root node is 0.
Binary tree functions: Select the function you like to proceed with,
  1. Insert root
  2. Insert left
  3. Insert right
  4. Inorder Successor
  5. Inorder Traversal
  6. Terminate Program
Selection choice: 1
Error: This is not an empty binary tree.
Binary tree functions: Select the function you like to proceed with,
  1. Insert root
  2. Insert left
  3. Insert right
  4. Inorder Successor
  5. Inorder Traversal
  6. Terminate Program
Selection choice: 2
Enter the parent information: 0
Enter the left child information: 1
The left child is 1
Binary tree functions: Select the function you like to proceed with,
  1. Insert root
  2. Insert left
  3. Insert right
  4. Inorder Successor
  5. Inorder Traversal
  6. Terminate Program
Selection choice: 3
Enter the parent information: 0
Enter the right child information: 2
The right child is 2
Binary tree functions: Select the function you like to proceed with,
  1. Insert root
  2. Insert left
  3. Insert right
  4. Inorder Successor
  5. Inorder Traversal
  6. Terminate Program
Selection choice: 2
Enter the parent information: 1
Enter the left child information: 3
The left child is 3
```

```
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 3
Enter the parent information: 1
Enter the right child information: 4
The right child is 4
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 2
Enter the parent information: 2
Enter the left child information: 5
The left child is 5
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 5
The inorder traversal of the tree is 3 1 4 0 5 2
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 4
Enter the node which you want to find the successor: 3
The inorder successor of 3 is 1
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 4
Enter the node which you want to find the successor: 1
The inorder successor of 1 is 4
```

```
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 4
Enter the node which you want to find the successor: 4
The inorder successor of 4 is 0
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 4
Enter the node which you want to find the successor: 0
The inorder successor of 0 is 5
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 4
Enter the node which you want to find the successor: 5
The inorder successor of 5 is 2
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 4
Enter the node which you want to find the successor: 2
The inorder succesor of 2 is not exist
Binary tree functions: Select the function you like to proceed with,
    1. Insert root
    2. Insert left
    3. Insert right
    4. Inorder Successor
    5. Inorder Traversal
    6. Terminate Program
Selection choice: 6
Terminate the Program
```