# Binary Tree - Homework

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# CODE using Python

data-structure > Trees > Homework > main.py > ...

```python
class Node:
    def __init__(self, value):
        self.value = value
        self.left = None
        self.right = None

class BinaryTree:
    def __init__(self):
        self.root = None

    def add_node(self, value):
        if self.root is None:
            self.root = Node(value)
        else:
            self._insert(self.root, value)

    def _insert(self, current, value):
        if value < current.value:
            if current.left is None:
                current.left = Node(value)
            else:
                self._insert(current.left, value)
        else:
            if current.right is None:
                current.right = Node(value)
            else:
                self._insert(current.right, value)

    def preorder(self, node):
        if node is None:
            return []
        return [node.value] +\
            self.preorder(node.left) +\
            self.preorder(node.right)
```

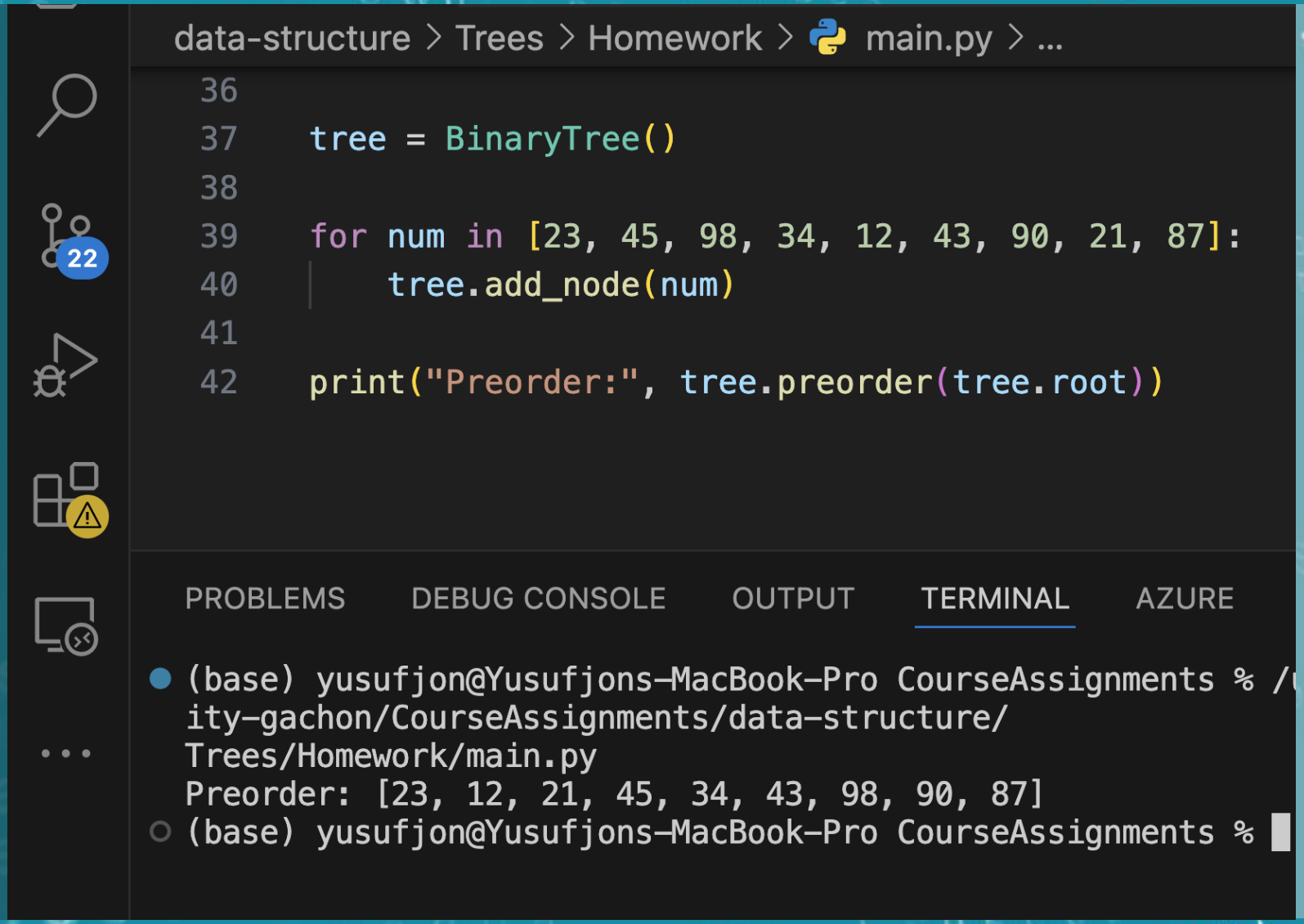
# Explanation

We have two classes named **BinaryTree** and **Node**.

**BinaryTree** has add_node and preorder methods which can be used to make a tree using nodes and to show the nodes' values in **preoreder Traversal. (Other traversal methods can be added to this class)**

**Node** has **value** which is a number, then left and right properties which store node in the same type but having different values, for example, **left** and **right** nodes we can say.

# Code Output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36
37 tree = BinaryTree()
38
39 for num in [23, 45, 98, 34, 12, 43, 90, 21, 87]:
40 tree.add_node(num)
41
42 print("Preorder:", tree.preorder(tree.root))
22
PROBLEMS
DEBUG CONSOLE
OUTPUT
TERMINAL
AZURE
(base) yusufjon@Yusufjons-MacBook-Pro CourseAssignments % /
ity-gachon/CourseAssignments/data-structure/
Trees/Homework/main.py
Preorder: [23, 12, 21, 45, 34, 43, 98, 90, 87]
(base) yusufjon@Yusufjons-MacBook-Pro CourseAssignments %