test

May 7, 2025

1 001 Binary Search Tree (BST)

[24]:
```
dict1 = {
            'value' : 4,
            'left' : None,
            'right' : None
        }

dict1['value']
```

[24]:
```
4
```

[36]:
```
root = {
            'value' : 14,
            'left' : {
                        'value' : 10,
                        'left' : {
                                    'value' : 8,
                                    'left' : None,
                                    'right' : None
                                },
                        'right' : {
                                    'value' : 12,
                                    'left' : None,
                                    'right' : None
                                }
                    },
            'right' : {
                        'value' : 20,
                        'left' : {
                                    'value' : 19,
                                    'left' : None,
                                    'right' : None
                                },
                        'right' : {
                                    'value' : 21,
                                    'left' : None,
```

```
                                    'right' : None
                                }
                    }
        }

print(root['value'])
print(root['left']['value']) # ---------------- since 10<root ; left
print(root['right']['value']) # ---------------- since 20>root ; right
```

```
14
10
20
```

[ ]:
```
# to access to the other next one
print(root['left']['left']['value'])

print(root['right']['right']['value'])
```

```
8
21
```

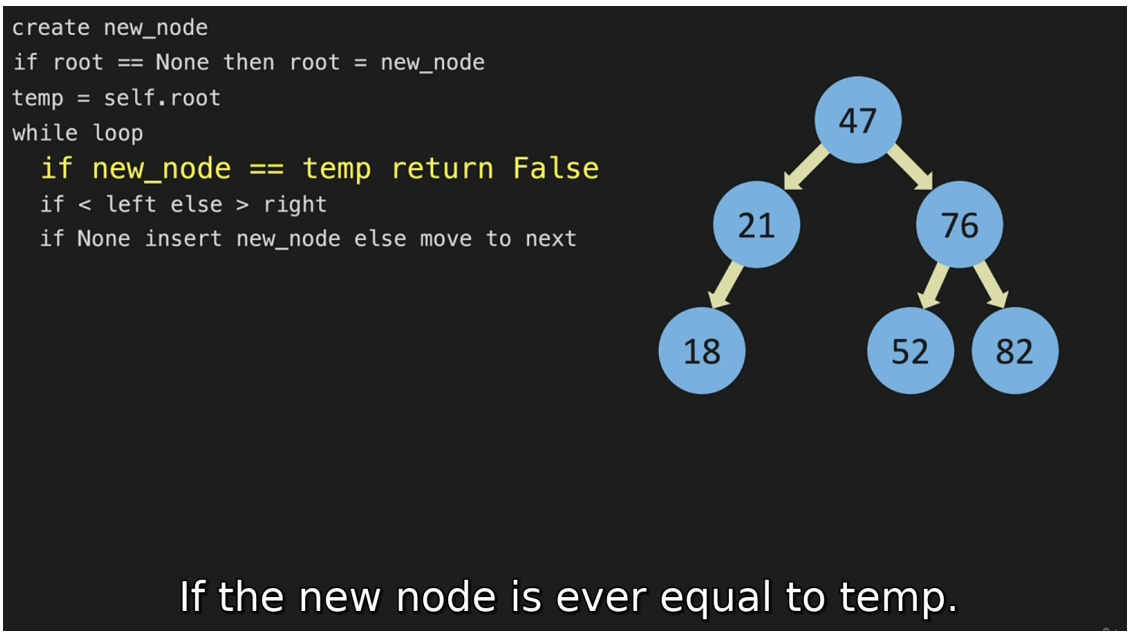
- similarly

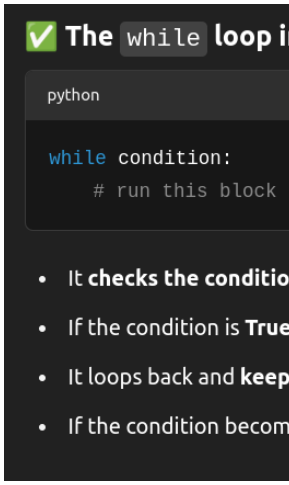
```
temp = self.root

if (some thing case):

        temp = temp.left  (in this way, we must switch to left)

else:

        temp = temp.right
```

2 003 Big O

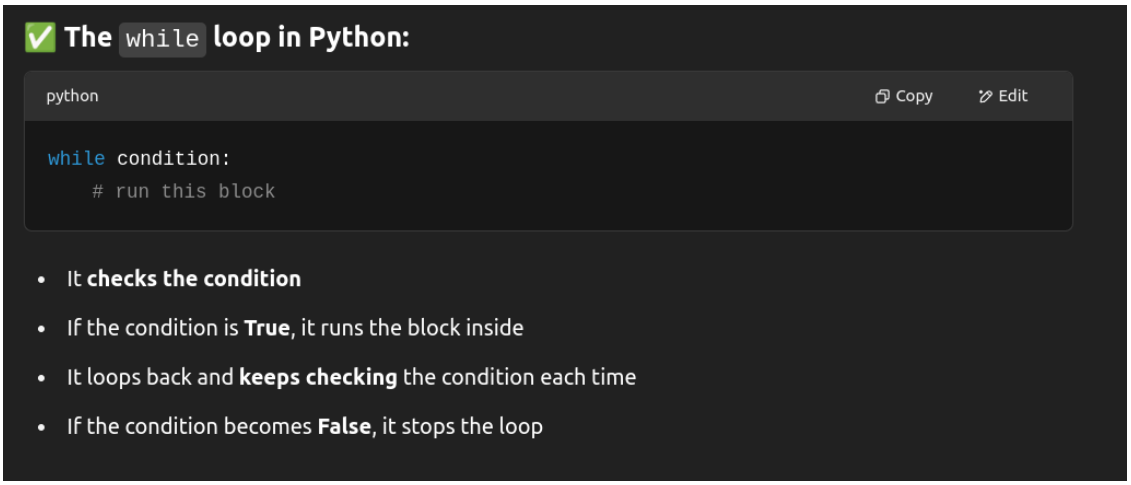
[ ]:
```

```

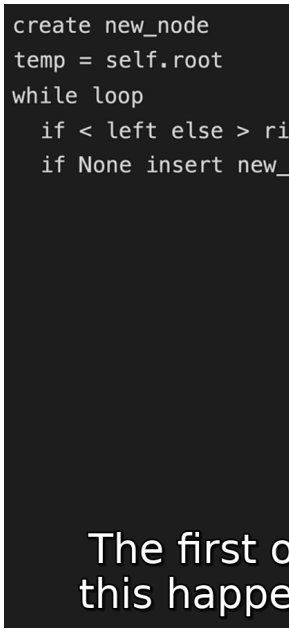
3 004 BST Constructor



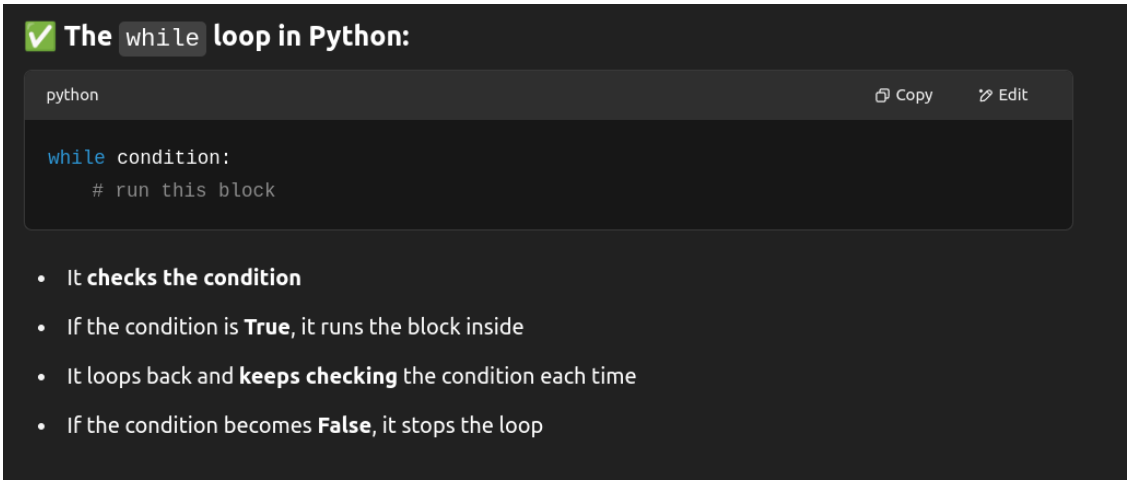


[1]:
```python
class Node:
    def __init__(self, value):
        self.value = value
        self.left = None
        self.right = None
```

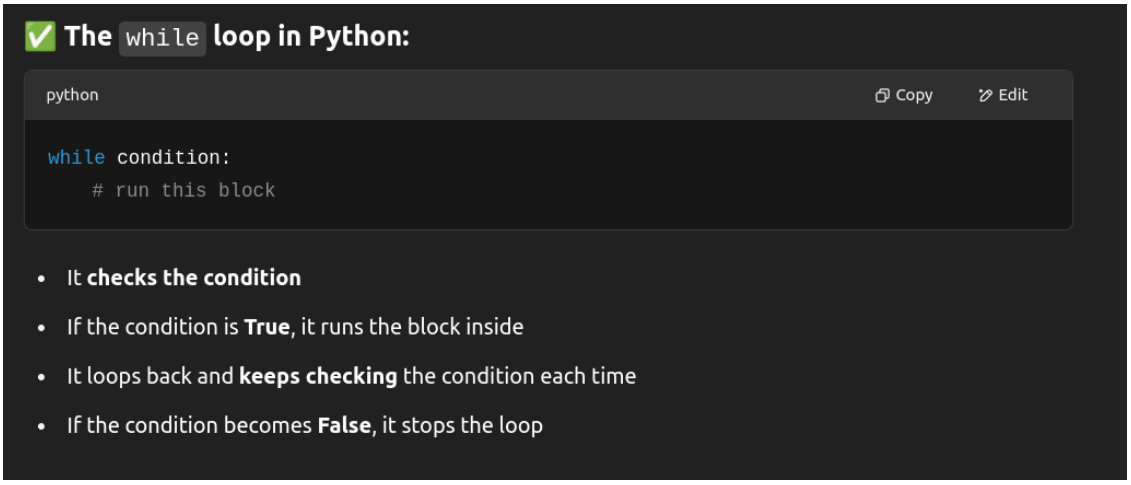


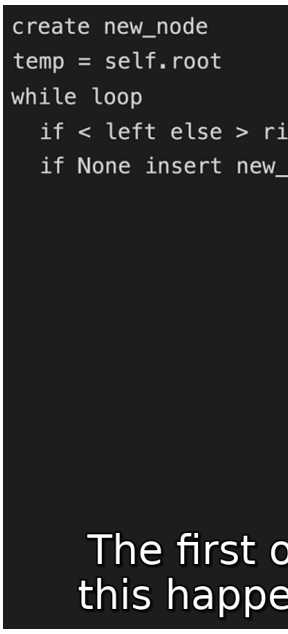


3.1 ————————-



3.2 ————————-

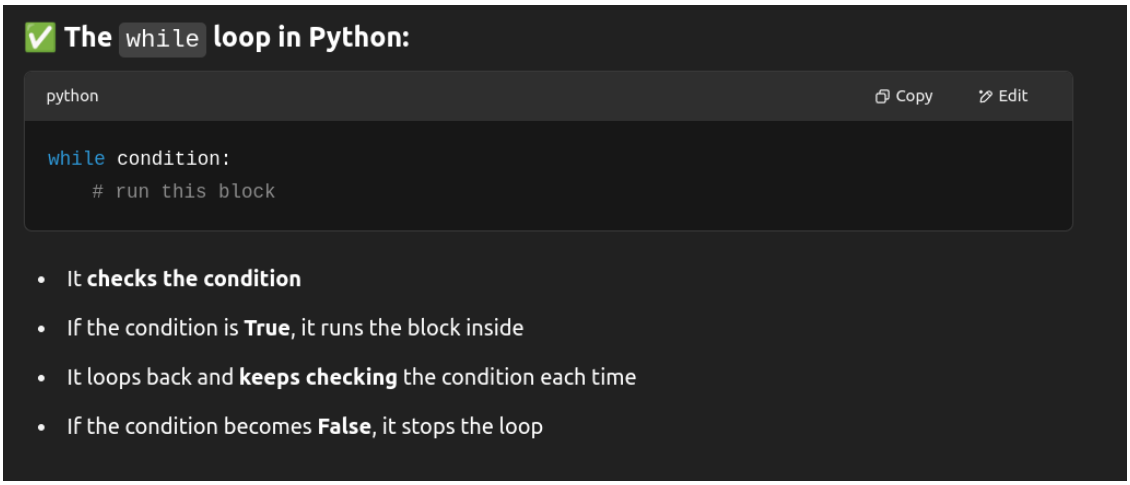


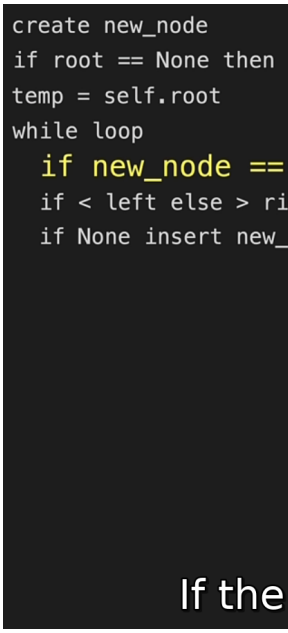


[2]:
```python
class Node:
    def __init__(self, value):
        self.value = value
        self.left = None
        self.right = None

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

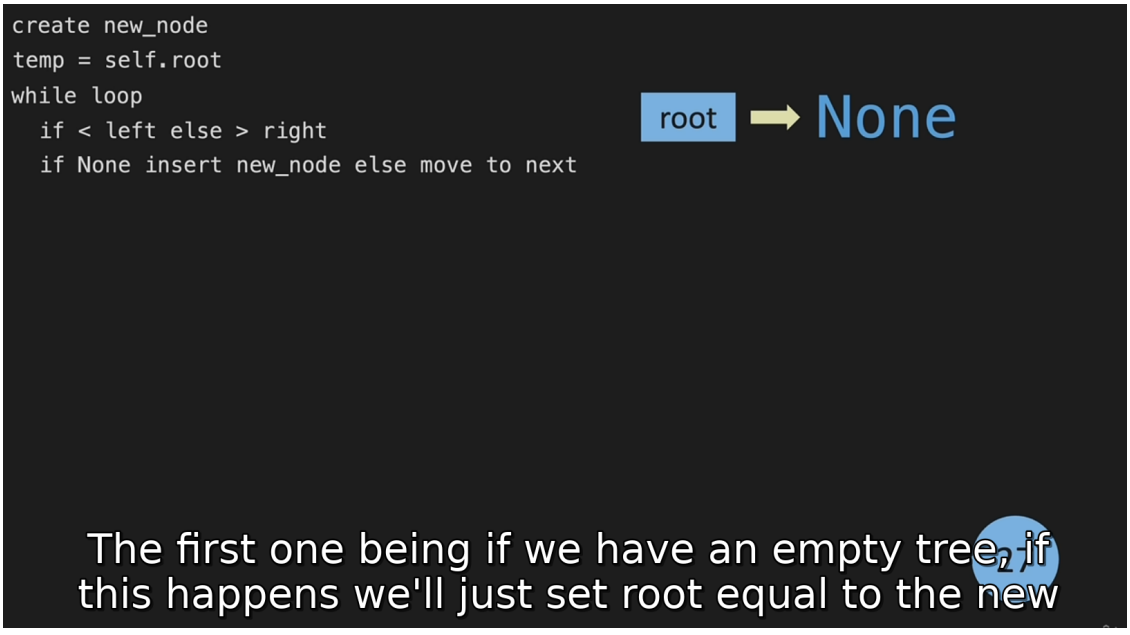
```
my_binarytree = BinaryTree()
```

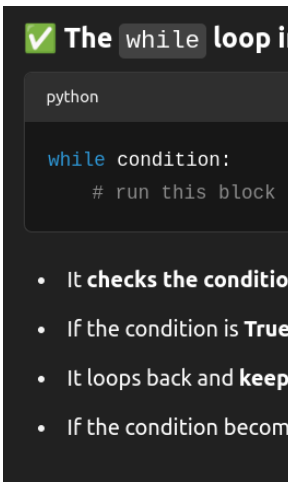
4 005 BST Insert - Intro.mp4





4.0.1 Edge cases





5 006 BST Insert - Code.mp4

[48]:
```
class Node:
    def __init__(self, value):
        self.value = value
        self.left = None
        self.right = None

class BinaryTree:
    def __init__(self):
        self.root = None   # Jaba binaryTree class ko instance banainxa; Yo␣
 ↪class ko / Or / Yo tree ko eauta matra self.root hunxa !! Be caareful

    def insert(self, value):
        new_node = Node(value)
        if self.root is None:
            self.root = new_node
            return True

        temp = self.root
        while (True):
            if temp.value == new_node.value:
                return False

            if new_node.value < temp.value :
                if temp.left is None:
                    temp.left = new_node
                    return True
                temp = temp.left
            else:
                if temp.right is None:
                    temp.right = new_node
                    return True
                temp = temp.right

    # def print_tree


my_binarytree = BinaryTree()
my_binarytree.insert(10)
my_binarytree.insert(20)
my_binarytree.insert(5)

print(my_binarytree.root)
print(my_binarytree.root.left)
print(my_binarytree.root.right)
```

```
print(my_binarytree.root.value)
print(my_binarytree.root.left.value)
print(my_binarytree.root.right.value)
```

```
<__main__.Node object at 0x79b64ebb84c0>
<__main__.Node object at 0x79b64ebba110>
<__main__.Node object at 0x79b64f56a950>
10
5
20
```

Redo the insert method:

[49]:
```
class Node:
    def __init__(self, value):
        self.value = value
        self.left = None
        self.right = None

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

    def insert(self, value):
        # edge cases
        new_node = Node(value)
        if self.root == None:
            self.root = new_node
            return True

        temp = self.root
        while (True):   # while True sets up an infinite loop.
            if temp.value == new_node.value:
                return False

            if new_node.value < temp.value:
                if temp.left is None:
                    temp.left = new_node
                    return True

                temp = temp.left
            else:

                if temp.right is None:
                    temp.right = new_node
                    return True
                temp = temp.right
```

```
my_binarytree = BinaryTree()
my_binarytree.insert(5)

my_binarytree.insert(6)

my_binarytree.insert(4)

my_binarytree.insert(3)

print(my_binarytree.root.value)
print(my_binarytree.root.left.value)
print(my_binarytree.root.right.value)
print(f'--------------------')
print(my_binarytree.root.left.left.value)
```

```
5
4
6
--------------------
3
```

```
        **return True** or **return False** is for the function, not the while loop.
```

Here's how it works:

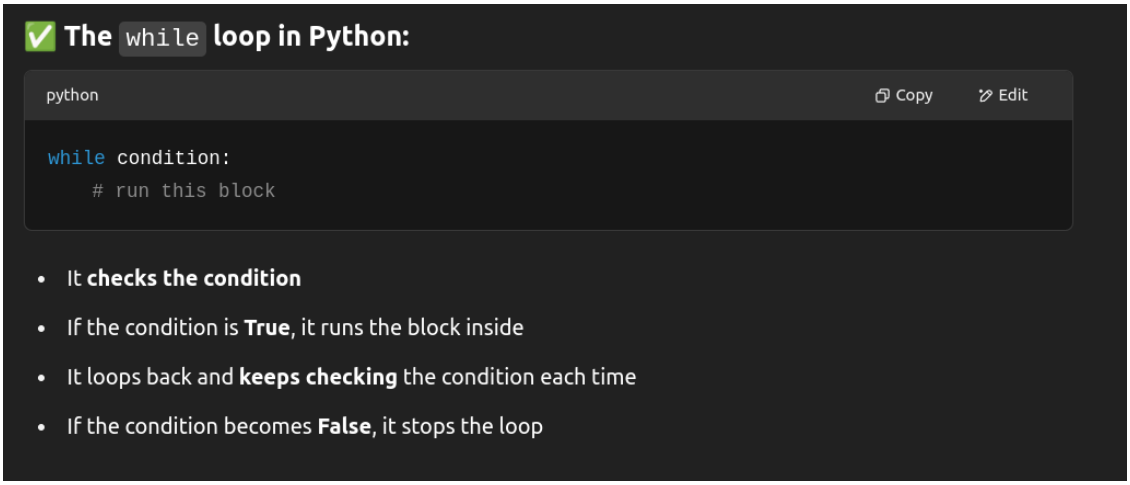
When Python sees a return inside a function:

It exits the entire function immediately,

And sends the return value (True or False) back to wherever the function was called,

The while loop also ends because the function is no longer running.

```
    while True:

        if condition_met:

            return True  # ends the whole function here
```



- that means while (True):

```
Function 1st work: TO check the Condtion if it is True or not

but condition = True

Adn the true is always true

Therefore, it setup an infinite funciton
```

6 007 BST Contains.mp4

[ ]:
```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 insert(self,value):
        new_node = Node(value)

        temp = self.root

        if self.root is None:
            self.root = new_node
            return True


        while(True):
```

```
            if temp.value == new_node.value:
                return False

            if new_node.value < temp.value :
                if temp.left is None:
                    temp.left = new_node
                    return True
                temp = temp.left
            else:
                if temp.right is None:
                    temp.right = new_node
                    return True
                temp = temp.right

    def contain(self, value):
        if self.root == None :
            return None

        temp = self.root

        while temp is not None:
            if temp.value == value :
                return temp

            if value < temp.value:
                temp = temp.left
            else:
                temp = temp.right


#␣
  ↪-------------------------------------------------------------------------------


my_binarytree = BinaryTree()
my_binarytree.insert(5)

my_binarytree.insert(6)

my_binarytree.insert(4)

my_binarytree.insert(3)

print(my_binarytree.root.value)
print(my_binarytree.root.left.value)
print(my_binarytree.root.right.value)
print(f'--------------------')
```

```
print(my_binarytree.root.left.left.value)


print(f'-------------Now finding -------')
address = my_binarytree.contain(3)

print(address.value)
```

```
5
4
6
--------------------
3
-------------Now finding -------
3
```

6.0.1 Write a clean code

[ ]: