

# CAC\_3\_22112028

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## 1 CAC- 3

## 2 Design a car showroom management system that stores the details of the cars using a binary search tree and plans deliveries using a queue.

## 3 Using trees to store the Car Details

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[1]: ## Final Code for the Tree

class Node:
    def __init__(self, car_name, price):
        self.car_name = car_name
        self.price = price
        self.left = None
        self.right = None

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

    def insert(self, root, car_name, price):
        node = Node(car_name, price)
        if root is None:
            return node
        else:
            if root.price == node.price:
                return root
            elif root.price < node.price:
                root.right = self.insert(root.right, car_name, price)
            else:
                root.left = self.insert(root.left, car_name, price)
            return root

    def inorder(self, root):
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    if root:
        self.inorder(root.left)
        print(root.car_name, root.price)
        self.inorder(root.right)
        #print(root.right)

def search(self, price):
    current = self.root
    while current is not None:
        if price == current.price:
            return current.car_name, current.price
        elif car_price < current.price:
            current = current.left
        else:
            current = current.right
    return None

def minValueNode(self, node):
    current = node

    # loop down to find the leftmost leaf
    while(current.left is not None):
        current = current.left
    return current

def deleteNode(self, root, key):
    # Base Case
    if root is None:
        return root

    # If the key to be deleted is smaller than the root's key then it lies
    ↪ in left subtree
    if key < root.price:
        root.left = self.deleteNode(root.left, key)

    # If the kye to be delete is greater than the root's key then it lies
    ↪ in right subtree
    elif(key > root.price):
        root.right = self.deleteNode(root.right, key)

    # If key is same as root's key, then this is the node to be deleted
    else:
        # Node with only one child or no child
        if root.left is None:
            temp = root.right
            root = None
            return temp

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        elif root.right is None:
            temp = root.left
            root = None
            return temp

        # Node with two children
        temp = self.minValueNode(root.right)
        root.price = temp.price
        #root.car_name = temp.car_name
        root.right = self.deleteNode(root.right, temp.price)
    return root

def main():
    bst = Tree()
    root = None

    while True:
        print("1 - To Insert the Car details and the Price of the same")
        print("2 - Delete the Car-details using Price")
        print("3 - To Display the Details Available")
        print("0 - Exit the code")
        print()

        ch = int(input("Enter your choice: "))
        print()

        if ch == 1:
            car_name = input("Enter car name: ")
            price = int(input("Enter the car price: "))
            root = bst.insert(root, car_name, price)
            print("Car inserted successfully")
            print()

        elif ch == 2:
            price = int(input("Enter the car to be deleted: "))
            root = bst.deleteNode(root, price)
            print("Car deleted successfully")
            print()

        elif ch == 3:
            print("Car Name and it's Prices are as follows: ")
            bst.inorder(root)
            print()

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        elif ch == 0:
            print("Exit")
            break
        print()
main()
```

1 - To Insert the Car details and the Price of the same  
2 - Delete the Car-details using Price  
3 - To Display the Details Available  
0 - Exit the code

Enter your choice: 1

Enter car name: Polo  
Enter the car price: 800000  
Car inserted successfully

1 - To Insert the Car details and the Price of the same  
2 - Delete the Car-details using Price  
3 - To Display the Details Available  
0 - Exit the code

Enter your choice: 1

Enter car name: Audi-Q3  
Enter the car price: 6500000  
Car inserted successfully

1 - To Insert the Car details and the Price of the same  
2 - Delete the Car-details using Price  
3 - To Display the Details Available  
0 - Exit the code

Enter your choice: 1

Enter car name: E-Class  
Enter the car price: 7500000  
Car inserted successfully

1 - To Insert the Car details and the Price of the same  
2 - Delete the Car-details using Price  
3 - To Display the Details Available  
0 - Exit the code

Enter your choice: 1

Enter car name: Discovery

Enter the car price: 10000000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 1

Enter car name: Fortuner  
Enter the car price: 4200000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 1

Enter car name: Passat  
Enter the car price: 3600000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 1

Enter car name: Xuv-700  
Enter the car price: 2400000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 1

Enter car name: Hector  
Enter the car price: 1900000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same

- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 1

Enter car name: Amaze  
Enter the car price: 1300000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 1

Enter car name: Porsche-911  
Enter the car price: 40000000  
Car inserted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 3

Car Name and it's Prices are as follows:

Polo 800000  
Amaze 1300000  
Hector 1900000  
Xuv-700 2400000  
Passat 3600000  
Fortuner 4200000  
Audi-Q3 6500000  
E-Class 7500000  
Discovery 10000000  
Porsche-911 40000000

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 3

Car Name and it's Prices are as follows:

Polo 800000  
Amaze 1300000  
Hector 1900000  
Xuv-700 2400000  
Passat 3600000  
Fortuner 4200000  
Audi-Q3 6500000  
E-Class 7500000  
Discovery 10000000  
Porsche-911 40000000

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 2

Enter the car to be deleted: 1900000  
Car deleted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 3

Car Name and it's Prices are as follows:

Polo 800000  
Amaze 1300000  
Xuv-700 2400000  
Passat 3600000  
Fortuner 4200000  
Audi-Q3 6500000  
E-Class 7500000  
Discovery 10000000  
Porsche-911 40000000

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 2

Enter the car to be deleted: 4200000  
Car deleted successfully

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 3

Car Name and it's Prices are as follows:

Polo 800000

Amaze 1300000

Xuv-700 2400000

Passat 3600000

Audi-Q3 6500000

E-Class 7500000

Discovery 10000000

Porsche-911 40000000

- 1 - To Insert the Car details and the Price of the same
- 2 - Delete the Car-details using Price
- 3 - To Display the Details Available
- 0 - Exit the code

Enter your choice: 0

Exit

[ ]:

For the delivery system using Queues

[4]: *## Queue*

```
class Queue:
    def __init__(self, car_name):
        self.items = []
        self.car_name = car_name

    def insert_in_queue(self, car_name):
        self.items.append(car_name)

    def delete_in_queue(self):
        if not self.is_empty():
            return self.items.pop(0)

    def is_empty(self):
        return len(self.items) == 0
```



```

def display(self):
    for items in self.items:
        print(items)

def main():

    delivery = int(input("Enter number of pending deliveries: "))
    q = Queue(delivery)

    print("1 - To Add Car Details that needs to be delivered")
    print("2 - To Remove the car once Delivered")
    print("3 - Display all the pending deliveries")
    print("0 - Exit")

    while True:
        ch = int(input(" Enter your choice: "))
        print()

        if ch == 0:
            print("Exit")
            return

        if ch == 1:
            car_name = input("Enter the name of the car that is pending for_
↳Delivery: ")
            q.insert_in_queue(car_name)
            print()

        if ch == 2:
            ob = q.delete_in_queue()
            print(ob, "was delivered")
            print()

        if ch == 3:
            print("The pending deliveries are: ")
            q.display()
            print()

main()

```

Enter number of pending deliveries: 5  
1 - To Add Car Details that needs to be delivered  
2 - To Remove the car once Delivered  
3 - Display all the pending deliveries  
0 - Exit  
Enter your choice: 1

Enter the name of the car that is pending for Delivery: Discovery

Enter your choice: 1

Enter the name of the car that is pending for Delivery: Passat

Enter your choice: 1

Enter the name of the car that is pending for Delivery: Amaze

Enter your choice: 1

Enter the name of the car that is pending for Delivery: Polo

Enter your choice: 1

Enter the name of the car that is pending for Delivery: Audi-Q3

Enter your choice: 3

The pending deliveries are:  
Discovery  
Passat  
Amaze  
Polo  
Audi-Q3

Enter your choice: 2

Discovery was delivered

Enter your choice: 2

Passat was delivered

Enter your choice: 3

The pending deliveries are:  
Amaze  
Polo  
Audi-Q3

Enter your choice: 0

Exit

[ ]: