ASSIGNMENT 11.3

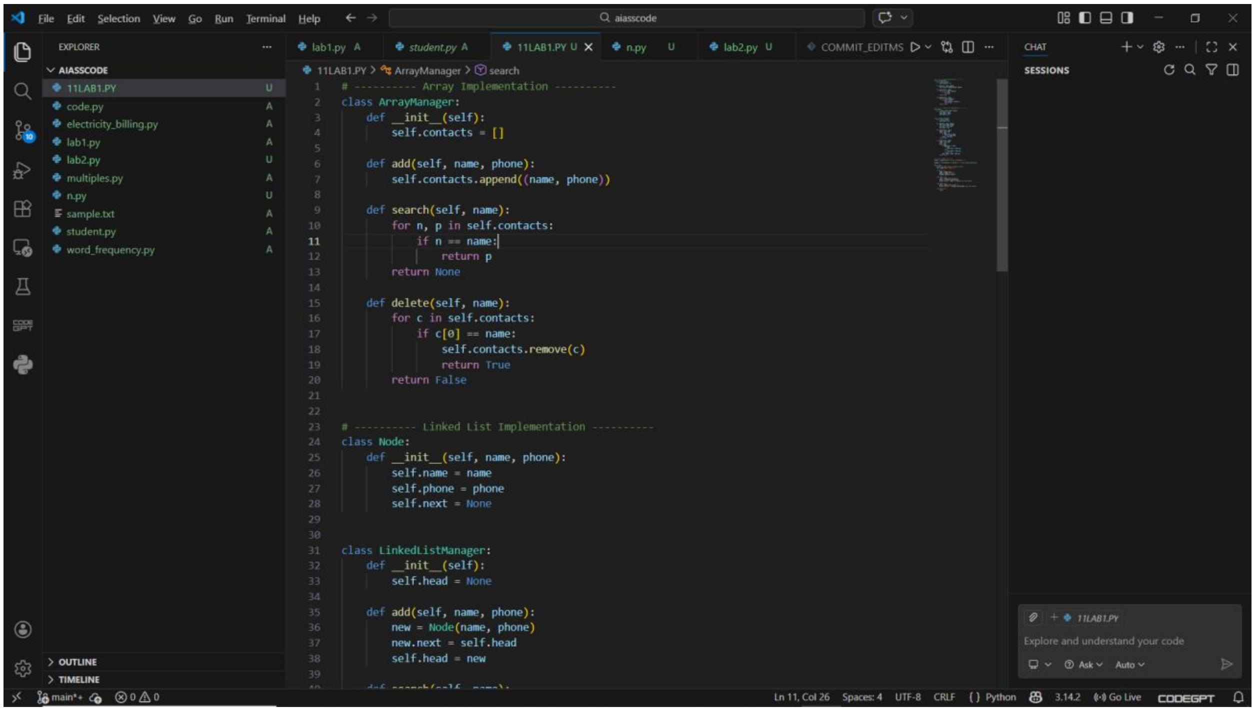
NAME:

HALLTICKET:

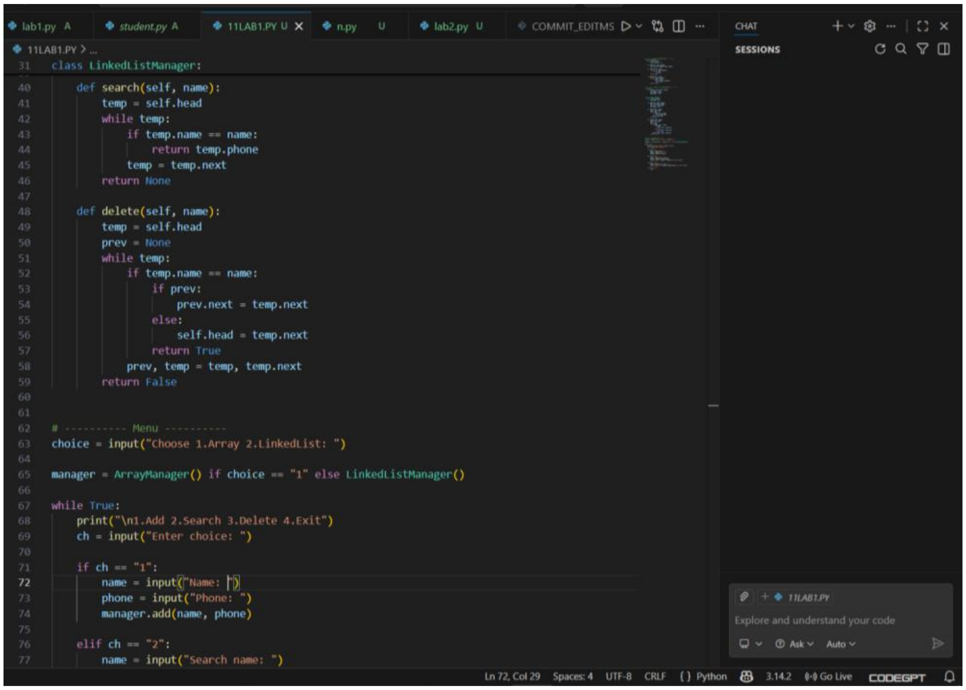
TASK1:

PROMPT

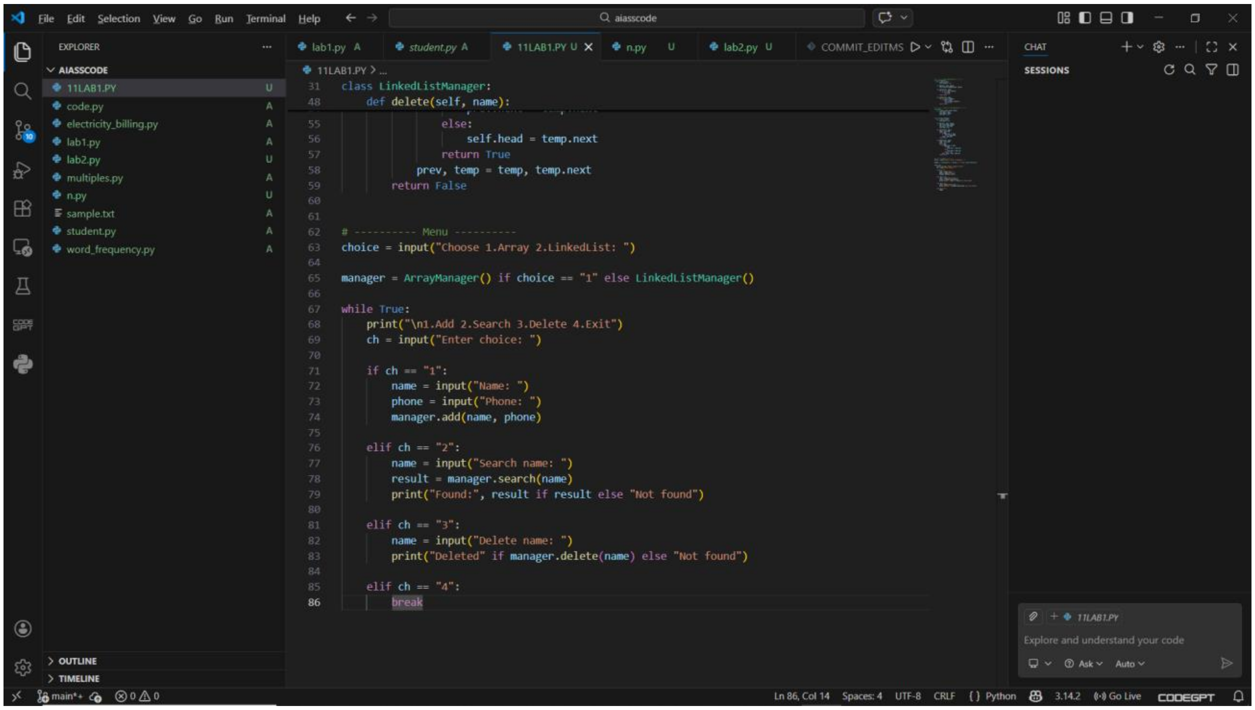
# Create a Smart Contact Manager in Python using both Array (list) and Linked List. Implement operations to add, search, and delete contacts.Provide a simple menu to choose implementation and perform operations.



```python
# ---------- Array Implementation ----------
class ArrayManager:
    def __init__(self):
        self.contacts = []

    def add(self, name, phone):
        self.contacts.append((name, phone))

    def search(self, name):
        for n, p in self.contacts:
            if n == name:
                return p
        return None

    def delete(self, name):
        for c in self.contacts:
            if c[0] == name:
                self.contacts.remove(c)
                return True
        return False


# ---------- Linked List Implementation ----------
class Node:
    def __init__(self, name, phone):
        self.name = name
        self.phone = phone
        self.next = None


class LinkedListManager:
    def __init__(self):
        self.head = None

    def add(self, name, phone):
        new = Node(name, phone)
        new.next = self.head
        self.head = new

    def search(self, name):
```

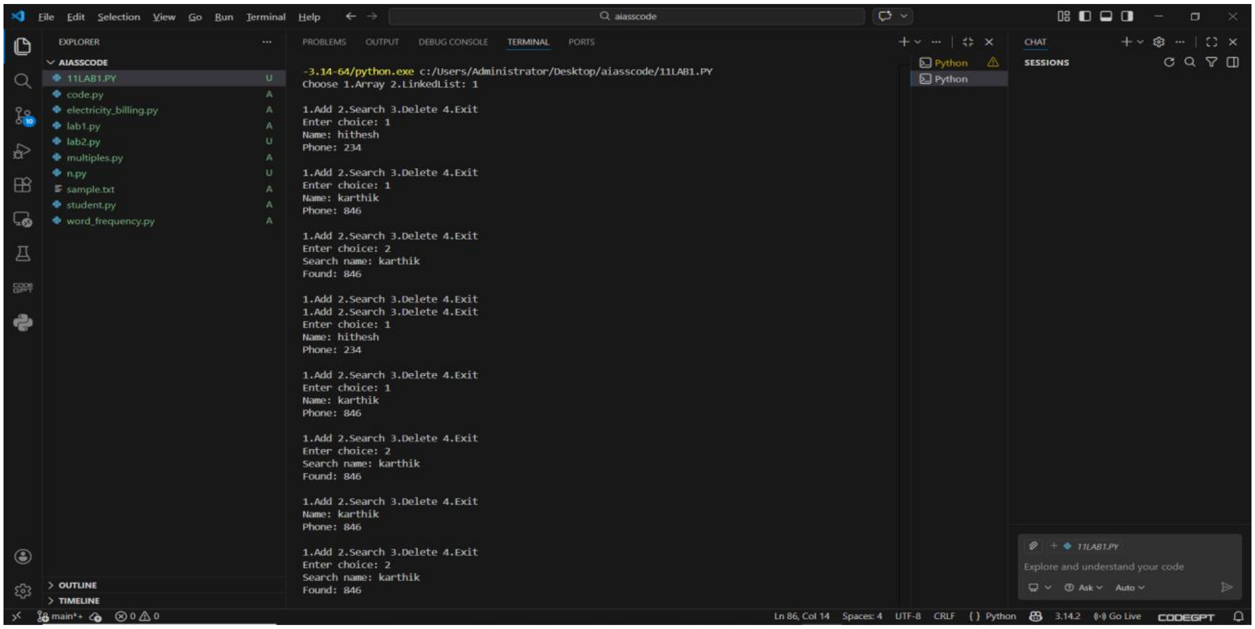


```python
class LinkedListManager:
    def search(self, name):
        temp = self.head
        while temp:
            if temp.name == name:
                return temp.phone
            temp = temp.next
        return None

    def delete(self, name):
        temp = self.head
        prev = None
        while temp:
            if temp.name == name:
                if prev:
                    prev.next = temp.next
                else:
                    self.head = temp.next
                return True
            prev, temp = temp, temp.next
        return False


# ---------- Menu ----------
choice = input("Choose 1.Array 2.LinkedList: ")

manager = ArrayManager() if choice == "1" else LinkedListManager()

while True:
    print("\n1.Add 2.Search 3.Delete 4.Exit")
    ch = input("Enter choice: ")

    if ch == "1":
        name = input("Name: ")
        phone = input("Phone: ")
        manager.add(name, phone)

    elif ch == "2":
        name = input("Search name: ")
```



```python
class LinkedListManager:
    def delete(self, name):
                else:
                    self.head = temp.next
                return True
            prev, temp = temp, temp.next
        return False


# ---------- Menu ----------
choice = input("Choose 1.Array 2.LinkedList: ")

manager = ArrayManager() if choice == "1" else LinkedListManager()

while True:
    print("\n1.Add 2.Search 3.Delete 4.Exit")
    ch = input("Enter choice: ")

    if ch == "1":
        name = input("Name: ")
        phone = input("Phone: ")
        manager.add(name, phone)

    elif ch == "2":
        name = input("Search name: ")
        result = manager.search(name)
        print("Found:", result if result else "Not found")

    elif ch == "3":
        name = input("Delete name: ")
        print("Deleted" if manager.delete(name) else "Not found")

    elif ch == "4":
        break
```

OUTPUT:



```
-3.14-64/python.exe c:/Users/Administrator/Desktop/aiasscode/11LAB1.PY
Choose 1.Array 2.LinkedList: 1

1.Add 2.Search 3.Delete 4.Exit
Enter choice: 1
Name: hithesh
Phone: 234

1.Add 2.Search 3.Delete 4.Exit
Enter choice: 1
Name: karthik
Phone: 846

1.Add 2.Search 3.Delete 4.Exit
Enter choice: 2
Search name: karthik
Found: 846

1.Add 2.Search 3.Delete 4.Exit
1.Add 2.Search 3.Delete 4.Exit
Enter choice: 1
Name: hithesh
Phone: 234

1.Add 2.Search 3.Delete 4.Exit
Enter choice: 1
Name: karthik
Phone: 846

1.Add 2.Search 3.Delete 4.Exit
Enter choice: 2
Search name: karthik
Found: 846

1.Add 2.Search 3.Delete 4.Exit
Name: karthik
Phone: 846

1.Add 2.Search 3.Delete 4.Exit
Enter choice: 2
Search name: karthik
Found: 846
```

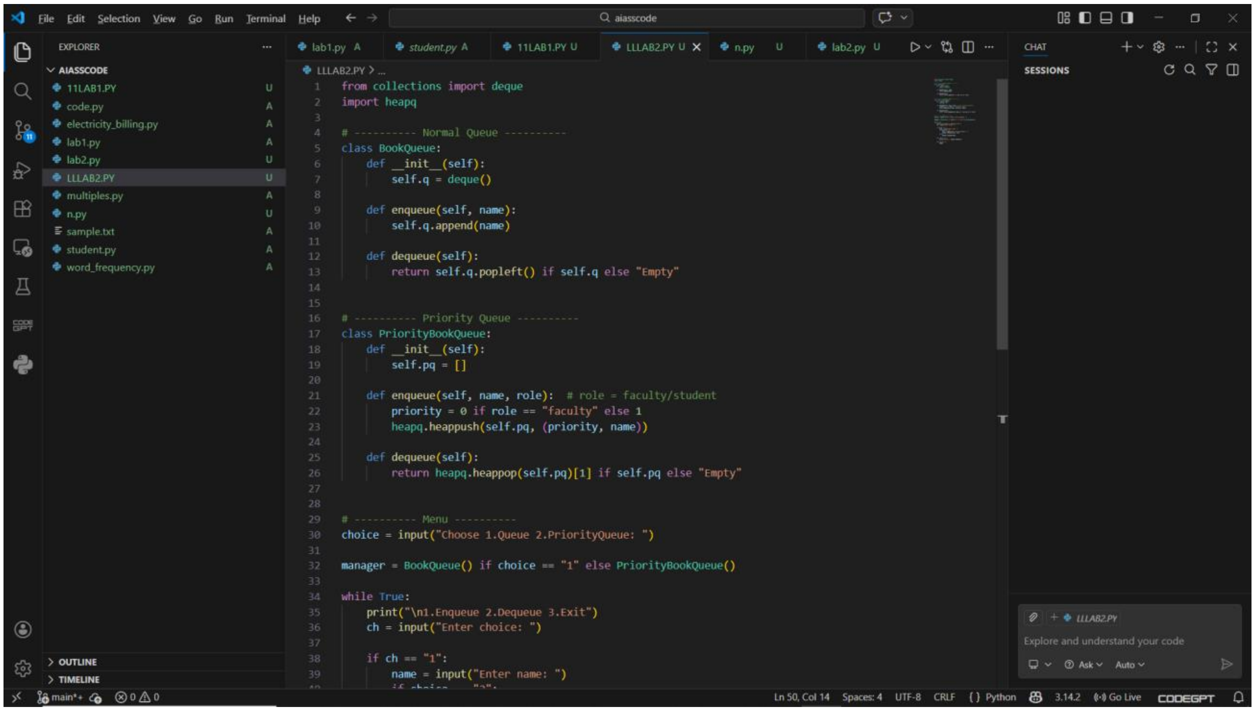
TASK2:

PROMPT:

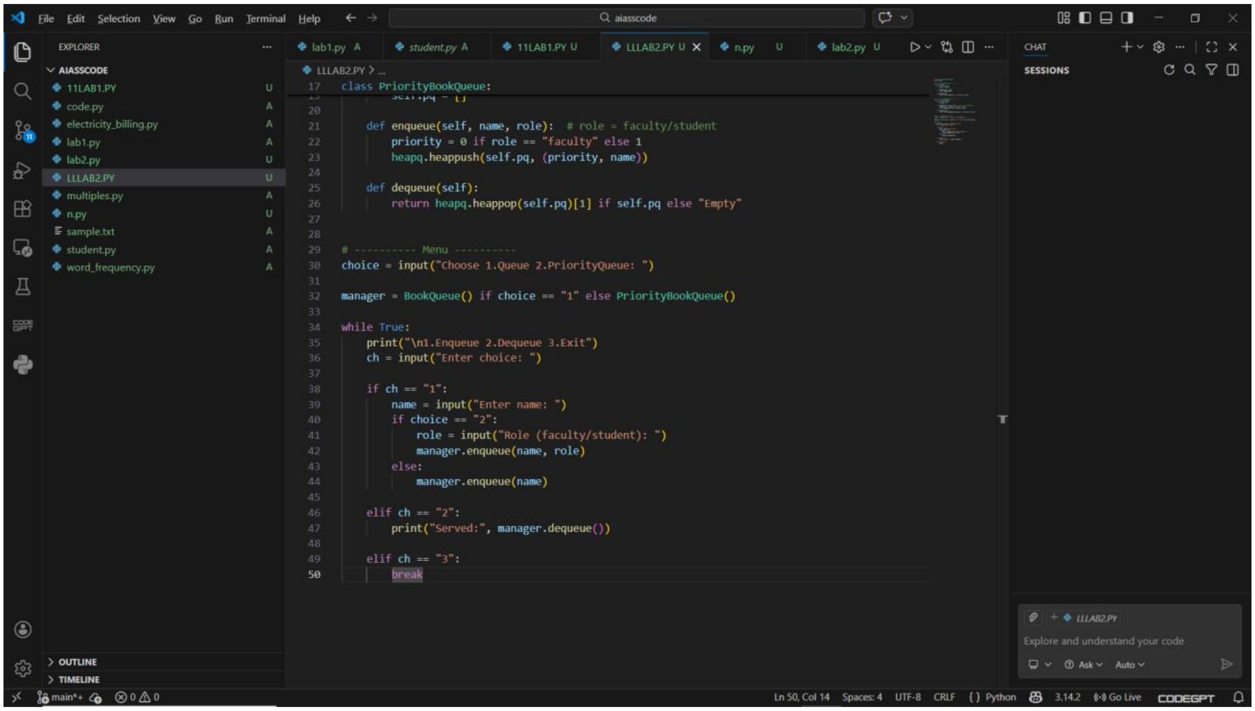
# Create a Library Book Request System in Python.

Implement a normal Queue (FIFO) and a Priority Queue where faculty requests

have higher priority than student requests. Include enqueue and dequeue methods and a simple menu for testing.

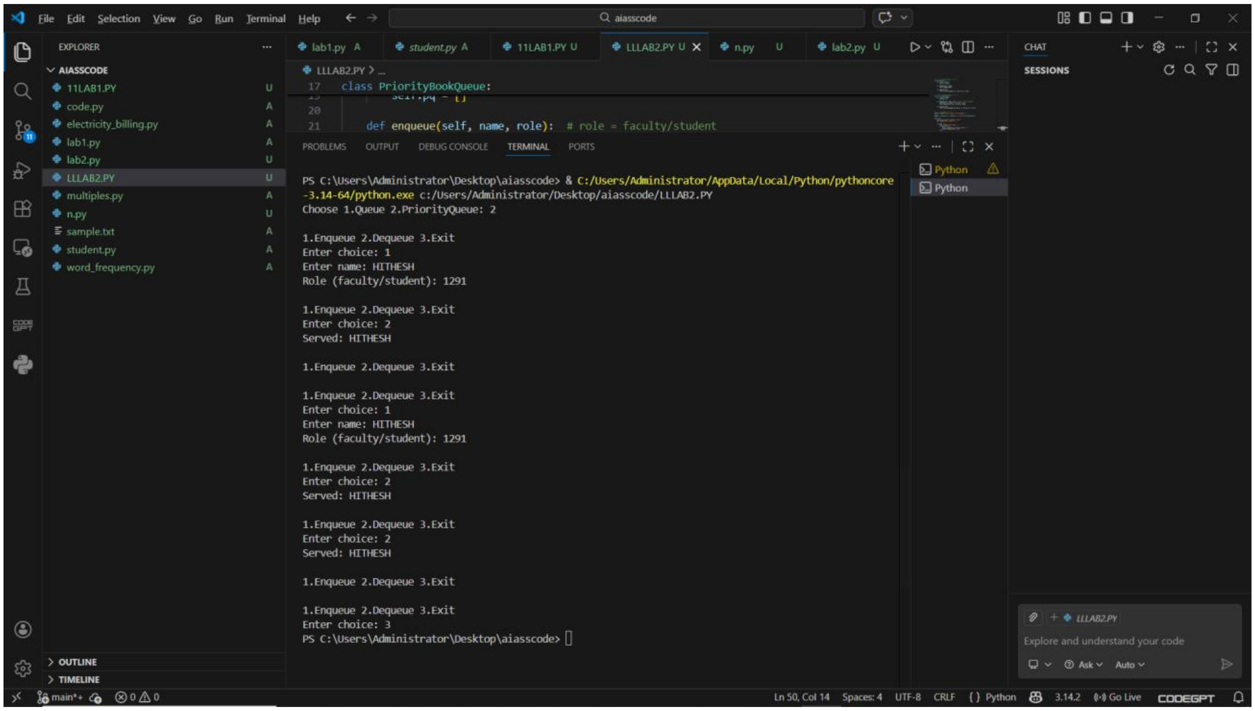


```python
from collections import deque
import heapq

# ---------- Normal Queue ----------
class BookQueue:
    def __init__(self):
        self.q = deque()

    def enqueue(self, name):
        self.q.append(name)

    def dequeue(self):
        return self.q.popleft() if self.q else "Empty"


# ---------- Priority Queue ----------
class PriorityBookQueue:
    def __init__(self):
        self.pq = []

    def enqueue(self, name, role):  # role = faculty/student
        priority = 0 if role == "faculty" else 1
        heapq.heappush(self.pq, (priority, name))

    def dequeue(self):
        return heapq.heappop(self.pq)[1] if self.pq else "Empty"


# ---------- Menu ----------
choice = input("Choose 1.Queue 2.PriorityQueue: ")

manager = BookQueue() if choice == "1" else PriorityBookQueue()

while True:
    print("\n1.Enqueue 2.Dequeue 3.Exit")
    ch = input("Enter choice: ")

    if ch == "1":
        name = input("Enter name: ")
```



```python
class PriorityBookQueue:

    def enqueue(self, name, role):  # role = faculty/student
        priority = 0 if role == "faculty" else 1
        heapq.heappush(self.pq, (priority, name))

    def dequeue(self):
        return heapq.heappop(self.pq)[1] if self.pq else "Empty"


# ---------- Menu ----------
choice = input("Choose 1.Queue 2.PriorityQueue: ")

manager = BookQueue() if choice == "1" else PriorityBookQueue()

while True:
    print("\n1.Enqueue 2.Dequeue 3.Exit")
    ch = input("Enter choice: ")

    if ch == "1":
        name = input("Enter name: ")
        if choice == "2":
            role = input("Role (faculty/student): ")
            manager.enqueue(name, role)
        else:
            manager.enqueue(name)

    elif ch == "2":
        print("Served:", manager.dequeue())

    elif ch == "3":
        break
```

OUTPUT:



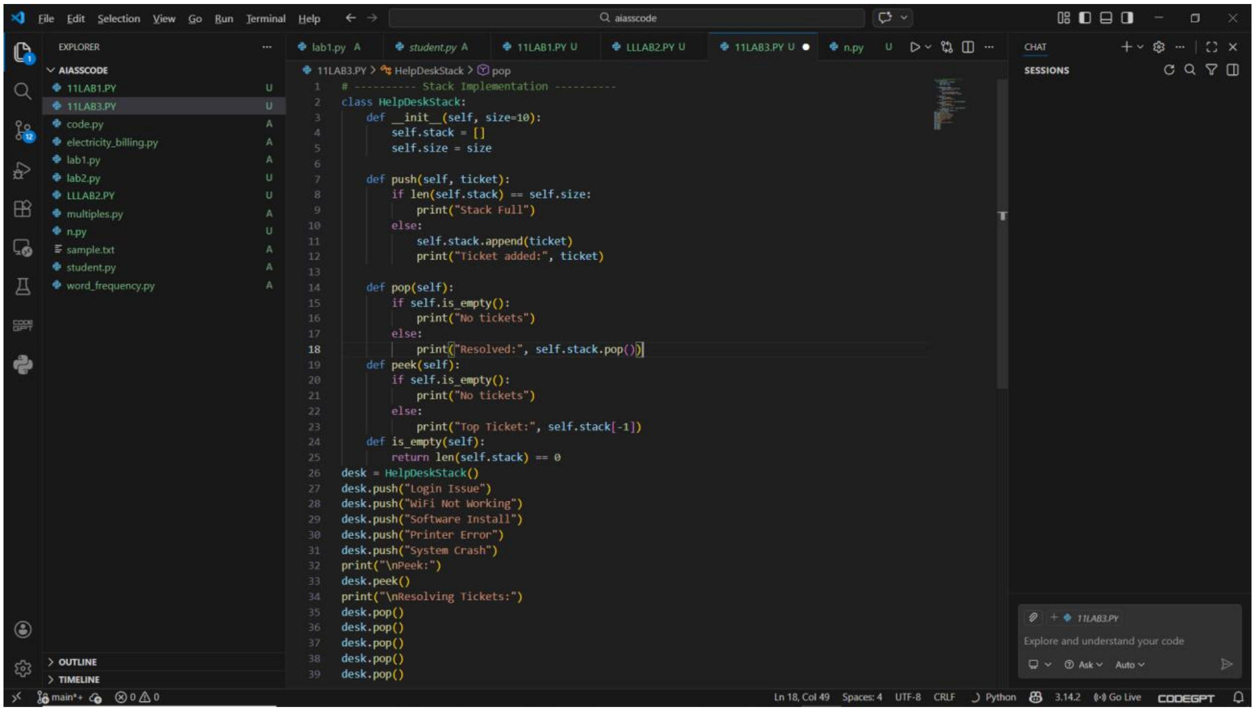
```
class PriorityBookQueue:

    def enqueue(self, name, role):  # role = faculty/student
```

```
PS C:\Users\Administrator\Desktop\aiasscode> & C:/Users/Administrator/AppData/Local/Python/pythoncore
-3.14-64/python.exe c:/Users/Administrator/Desktop/aiasscode/LLLAB2.PY
Choose 1.Queue 2.PriorityQueue: 2

1.Enqueue 2.Dequeue 3.Exit
Enter choice: 1
Enter name: HITHESH
Role (faculty/student): 1291

1.Enqueue 2.Dequeue 3.Exit
Enter choice: 2
Served: HITHESH

1.Enqueue 2.Dequeue 3.Exit

1.Enqueue 2.Dequeue 3.Exit
Enter choice: 1
Enter name: HITHESH
Role (faculty/student): 1291

1.Enqueue 2.Dequeue 3.Exit
Enter choice: 2
Served: HITHESH

1.Enqueue 2.Dequeue 3.Exit
Enter choice: 2
Served: HITHESH

1.Enqueue 2.Dequeue 3.Exit

1.Enqueue 2.Dequeue 3.Exit
Enter choice: 3
PS C:\Users\Administrator\Desktop\aiasscode> 
```

TASK3:

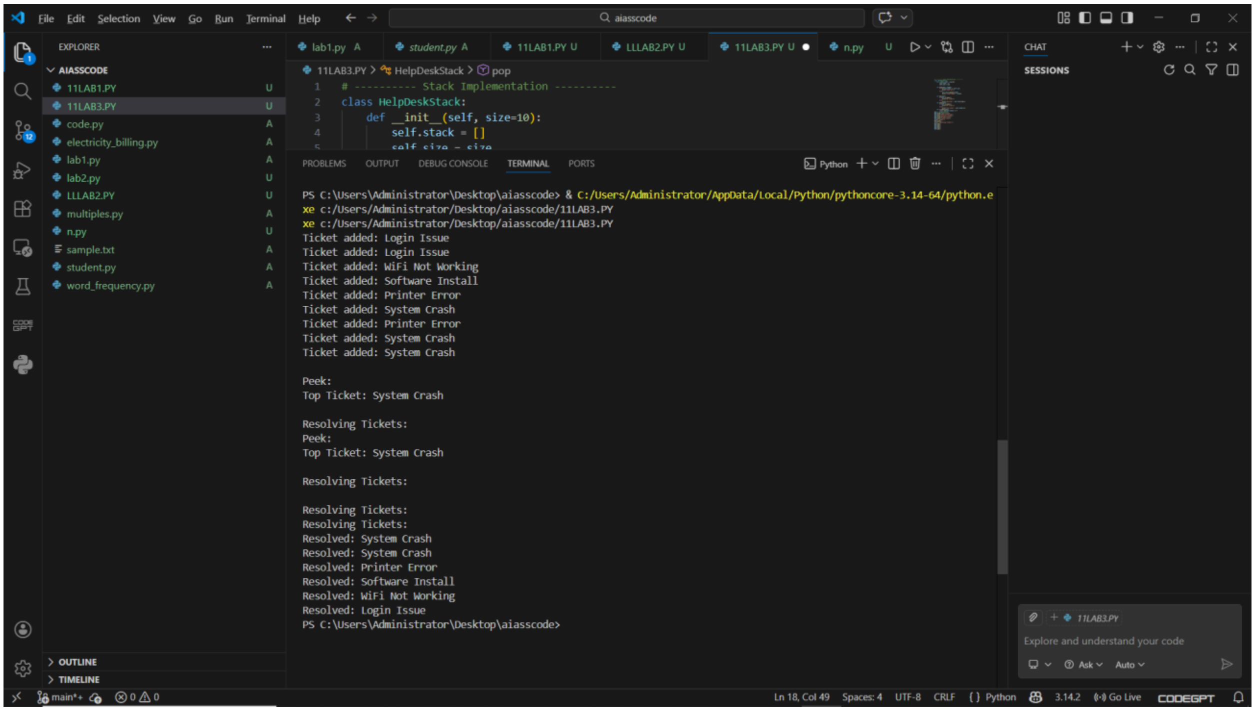
PROMPT:

# Create an Emergency Help Desk Ticket System using Stack in Python.Implement push, pop, peek operations and methods to check if stack is empty or full.Simulate at least five tickets being raised and resolved to demonstrate LIFO behavior.



```python
# ---------- Stack Implementation ----------
class HelpDeskStack:
    def __init__(self, size=10):
        self.stack = []
        self.size = size

    def push(self, ticket):
        if len(self.stack) == self.size:
            print("Stack Full")
        else:
            self.stack.append(ticket)
            print("Ticket added:", ticket)

    def pop(self):
        if self.is_empty():
            print("No tickets")
        else:
            print("Resolved:", self.stack.pop())
    def peek(self):
        if self.is_empty():
            print("No tickets")
        else:
            print("Top Ticket:", self.stack[-1])
    def is_empty(self):
        return len(self.stack) == 0
desk = HelpDeskStack()
desk.push("Login Issue")
desk.push("WiFi Not Working")
desk.push("Software Install")
desk.push("Printer Error")
desk.push("System Crash")
print("\nPeek:")
desk.peek()
print("\nResolving Tickets:")
desk.pop()
desk.pop()
desk.pop()
desk.pop()
desk.pop()
```

OUTPUT:



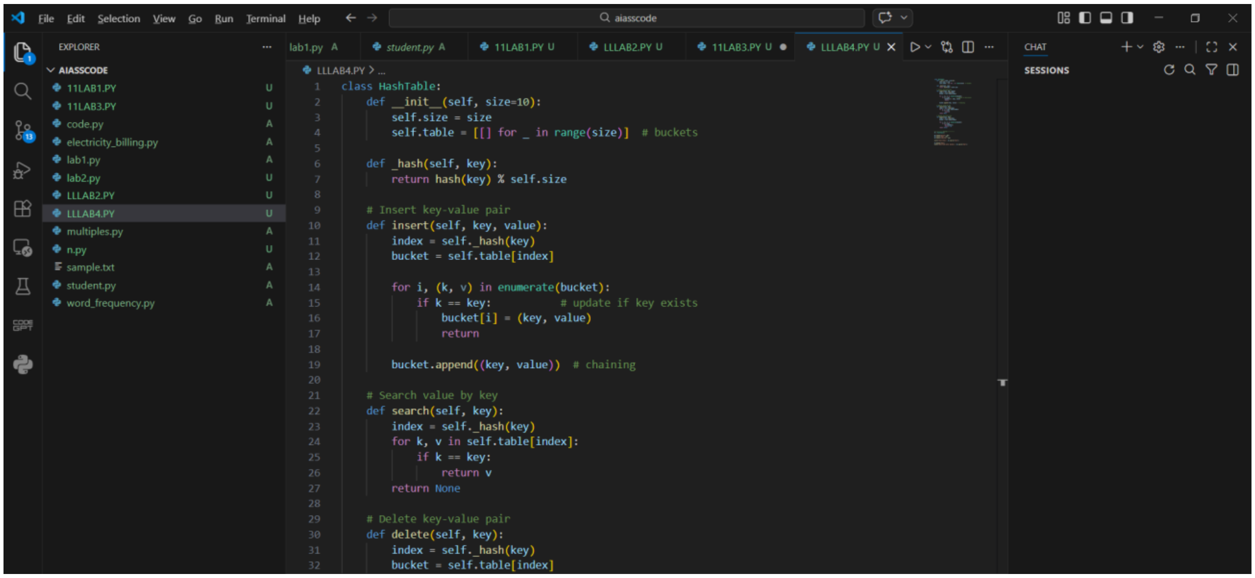
```python
# ---------- Stack Implementation ----------
class HelpDeskStack:
    def __init__(self, size=10):
        self.stack = []
```

```
PS C:\Users\Administrator\Desktop\aiasscode> & C:/Users/Administrator/AppData/Local/Python/pythoncore-3.14-64/python.e
xe c:/Users/Administrator/Desktop/aiasscode/11LAB3.PY
xe c:/Users/Administrator/Desktop/aiasscode/11LAB3.PY
Ticket added: Login Issue
Ticket added: Login Issue
Ticket added: WiFi Not Working
Ticket added: Software Install
Ticket added: Printer Error
Ticket added: System Crash
Ticket added: Printer Error
Ticket added: System Crash
Ticket added: System Crash

Peek:
Top Ticket: System Crash

Resolving Tickets:
Peek:
Top Ticket: System Crash

Resolving Tickets:

Resolving Tickets:
Resolving Tickets:
Resolved: System Crash
Resolved: System Crash
Resolved: Printer Error
Resolved: Software Install
Resolved: WiFi Not Working
Resolved: Login Issue
PS C:\Users\Administrator\Desktop\aiasscode>
```

TASK4:

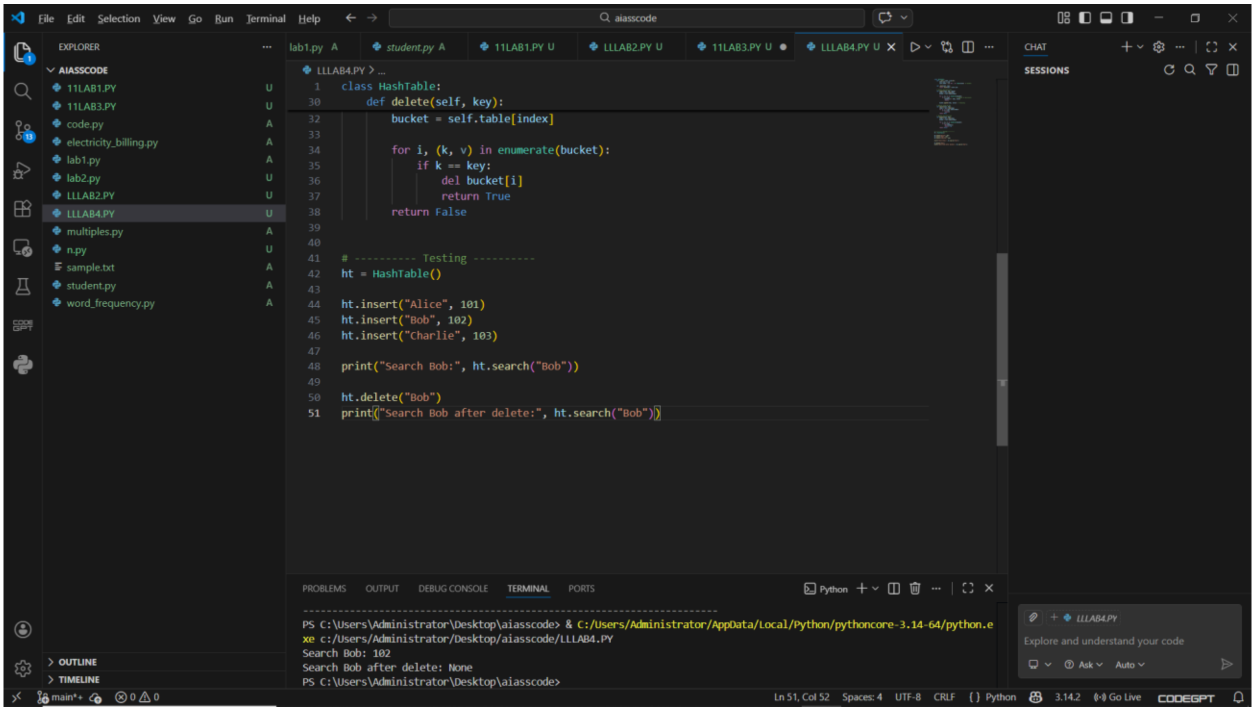
PROMPT:

# Create a Hash Table in Python using chaining for collision handling. Implement insert, search, and delete methods with proper comments.Test the hash table with some sample data.



```
class HashTable:
    def __init__(self, size=10):
        self.size = size
        self.table = [[] for _ in range(size)]  # buckets

    def _hash(self, key):
        return hash(key) % self.size

    # Insert key-value pair
    def insert(self, key, value):
        index = self._hash(key)
        bucket = self.table[index]

        for i, (k, v) in enumerate(bucket):
            if k == key:            # update if key exists
                bucket[i] = (key, value)
                return

        bucket.append((key, value))  # chaining

    # Search value by key
    def search(self, key):
        index = self._hash(key)
        for k, v in self.table[index]:
            if k == key:
                return v
        return None

    # Delete key-value pair
    def delete(self, key):
        index = self._hash(key)
        bucket = self.table[index]
```

OUTPUT:



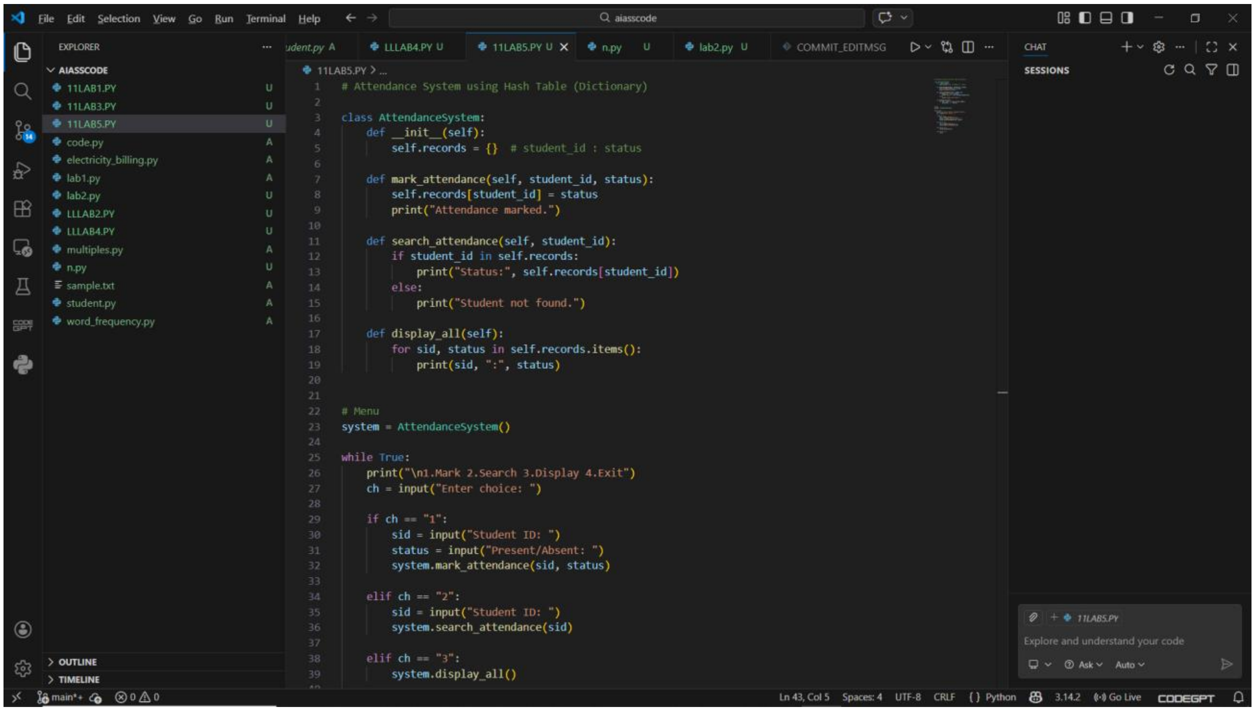
```
class HashTable:
    def delete(self, key):
        bucket = self.table[index]

        for i, (k, v) in enumerate(bucket):
            if k == key:
                del bucket[i]
                return True
        return False


# ---------- Testing ----------
ht = HashTable()

ht.insert("Alice", 101)
ht.insert("Bob", 102)
ht.insert("Charlie", 103)

print("Search Bob:", ht.search("Bob"))

ht.delete("Bob")
print("Search Bob after delete:", ht.search("Bob"))
```

```
---------------------------------------------------------------------------
PS C:\Users\Administrator\Desktop\aiasscode> & C:/Users/Administrator/AppData/Local/Python/pythoncore-3.14-64/python.e
xe c:/Users/Administrator/Desktop/aiasscode/LLLAB4.PY
Search Bob: 102
Search Bob after delete: None
PS C:\Users\Administrator\Desktop\aiasscode>
```

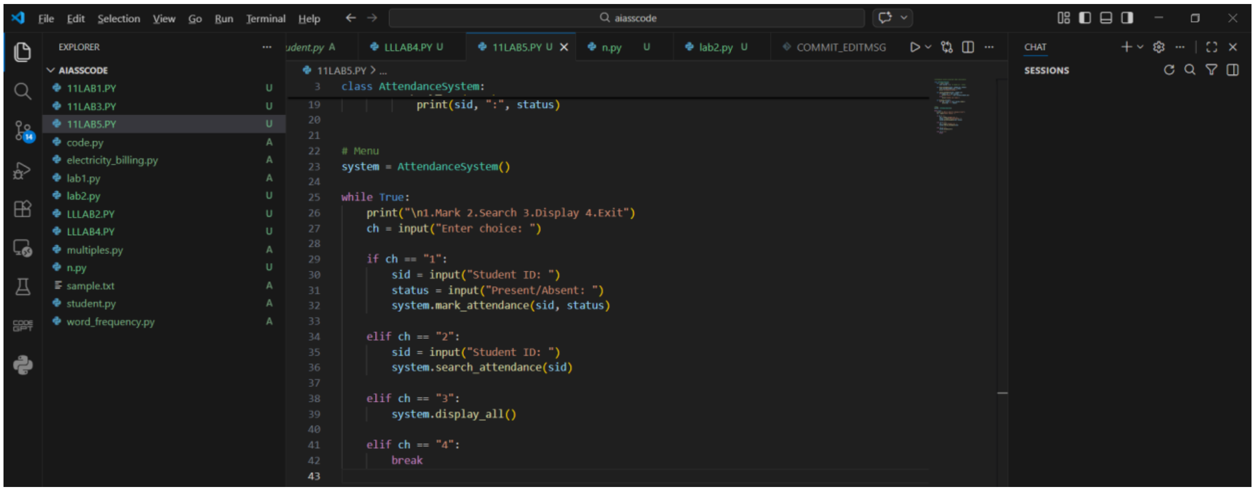
TASK5:

PROMPT:

# Create a Student Attendance Tracking System using a dictionary (hash table). Implement functions to mark attendance, search attendance, and display all records. Use a simple menu-driven program.

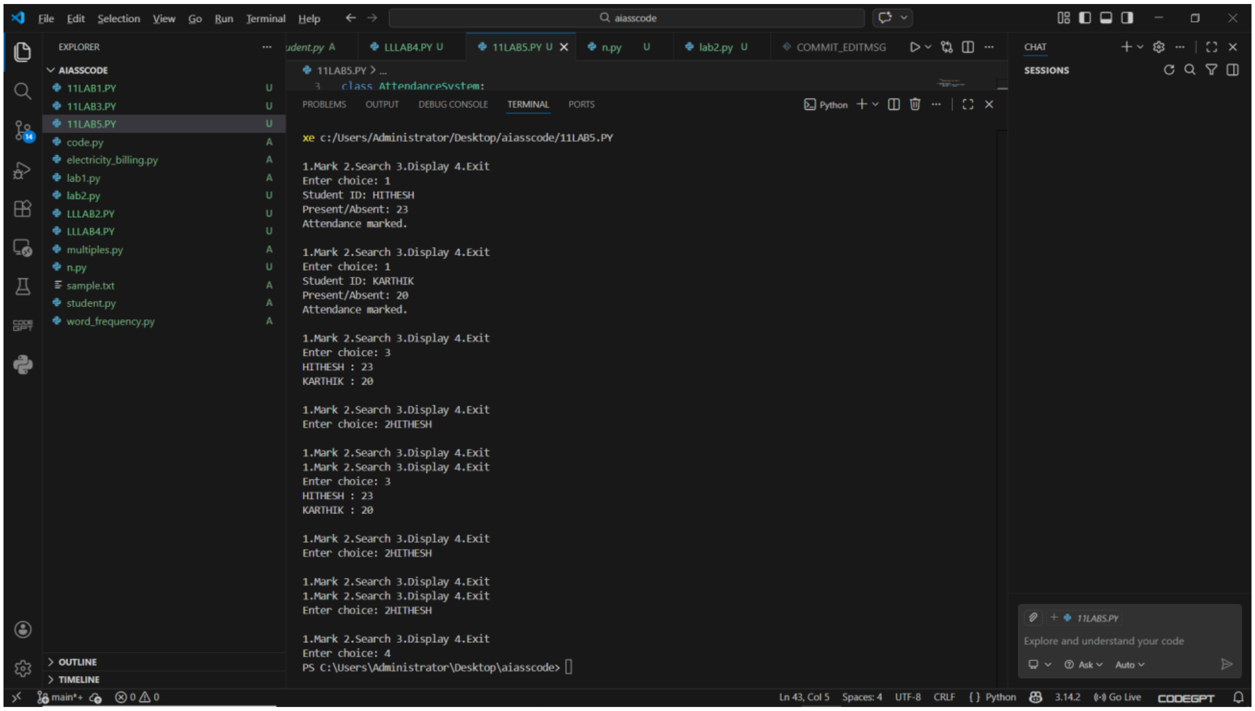


```python
# Attendance System using Hash Table (Dictionary)

class AttendanceSystem:
    def __init__(self):
        self.records = {}  # student_id : status

    def mark_attendance(self, student_id, status):
        self.records[student_id] = status
        print("Attendance marked.")

    def search_attendance(self, student_id):
        if student_id in self.records:
            print("Status:", self.records[student_id])
        else:
            print("Student not found.")

    def display_all(self):
        for sid, status in self.records.items():
            print(sid, ":", status)


# Menu
system = AttendanceSystem()

while True:
    print("\n1.Mark 2.Search 3.Display 4.Exit")
    ch = input("Enter choice: ")

    if ch == "1":
        sid = input("Student ID: ")
        status = input("Present/Absent: ")
        system.mark_attendance(sid, status)

    elif ch == "2":
        sid = input("Student ID: ")
        system.search_attendance(sid)

    elif ch == "3":
        system.display_all()
```



```python
class AttendanceSystem:
            print(sid, ":", status)


# Menu
system = AttendanceSystem()

while True:
    print("\n1.Mark 2.Search 3.Display 4.Exit")
    ch = input("Enter choice: ")

    if ch == "1":
        sid = input("Student ID: ")
        status = input("Present/Absent: ")
        system.mark_attendance(sid, status)

    elif ch == "2":
        sid = input("Student ID: ")
        system.search_attendance(sid)

    elif ch == "3":
        system.display_all()

    elif ch == "4":
        break

```

OUTPUT:



```
class AttendanceSystem:
```

```
xe c:/Users/Administrator/Desktop/aiasscode/11LAB5.PY

1.Mark 2.Search 3.Display 4.Exit
Enter choice: 1
Student ID: HITHESH
Present/Absent: 23
Attendance marked.

1.Mark 2.Search 3.Display 4.Exit
Enter choice: 1
Student ID: KARTHIK
Present/Absent: 20
Attendance marked.

1.Mark 2.Search 3.Display 4.Exit
Enter choice: 3
HITHESH : 23
KARTHIK : 20

1.Mark 2.Search 3.Display 4.Exit
Enter choice: 2HITHESH

1.Mark 2.Search 3.Display 4.Exit
1.Mark 2.Search 3.Display 4.Exit
Enter choice: 3
HITHESH : 23
KARTHIK : 20

1.Mark 2.Search 3.Display 4.Exit
Enter choice: 2HITHESH

1.Mark 2.Search 3.Display 4.Exit
1.Mark 2.Search 3.Display 4.Exit
Enter choice: 2HITHESH

1.Mark 2.Search 3.Display 4.Exit
Enter choice: 4
PS C:\Users\Administrator\Desktop\aiasscode> 
```