DATA STRUCTURES

LAB FILE

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ROLL NO - 2401420011

PROGRAM - B.Tech CSE (Data Science)

SEMESTER - III

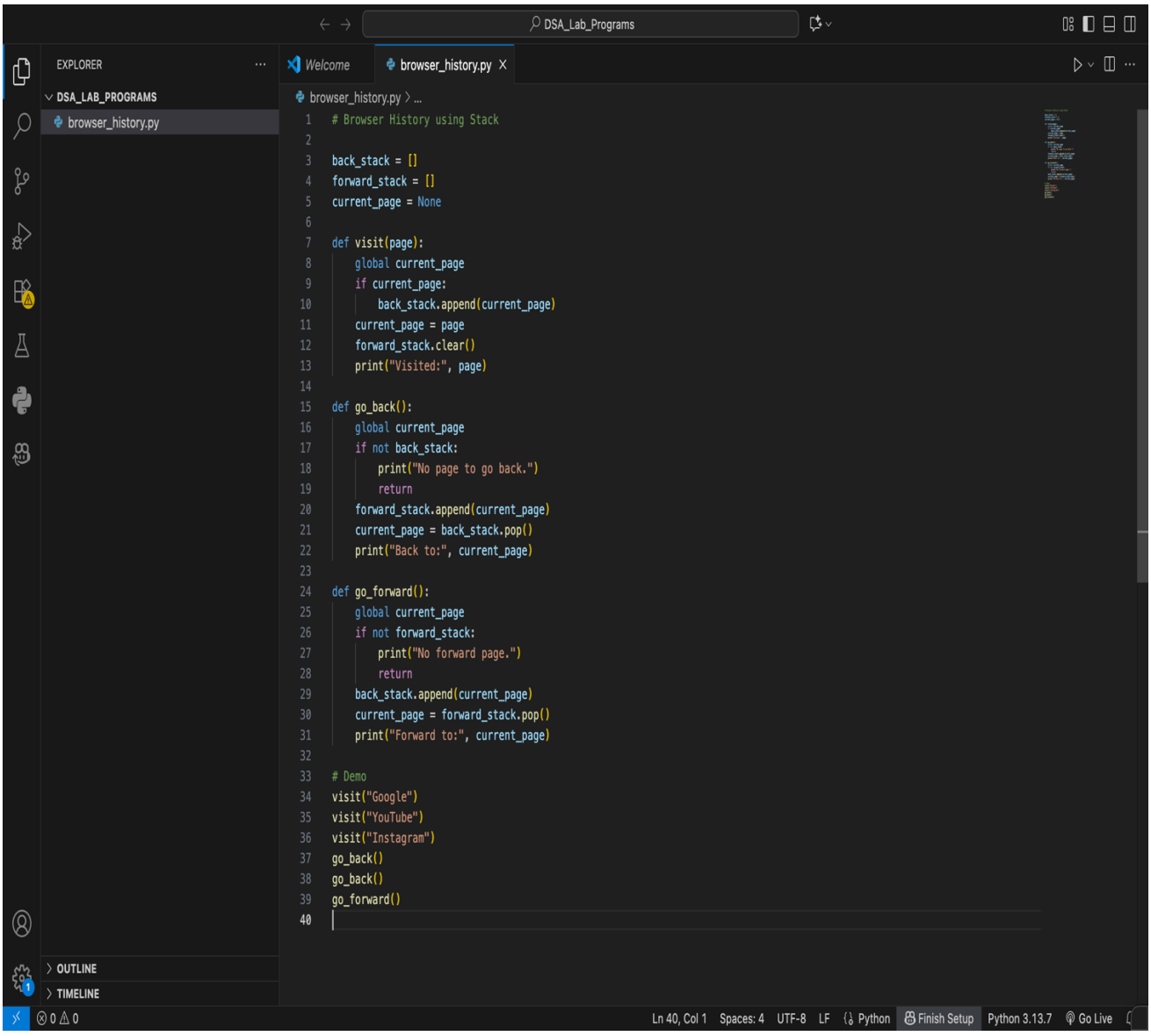
SUBMITTED TO -

INDEX

EXPERIMENT 1

Browser History Navigation System (Using Stack Concept)

CODE:-



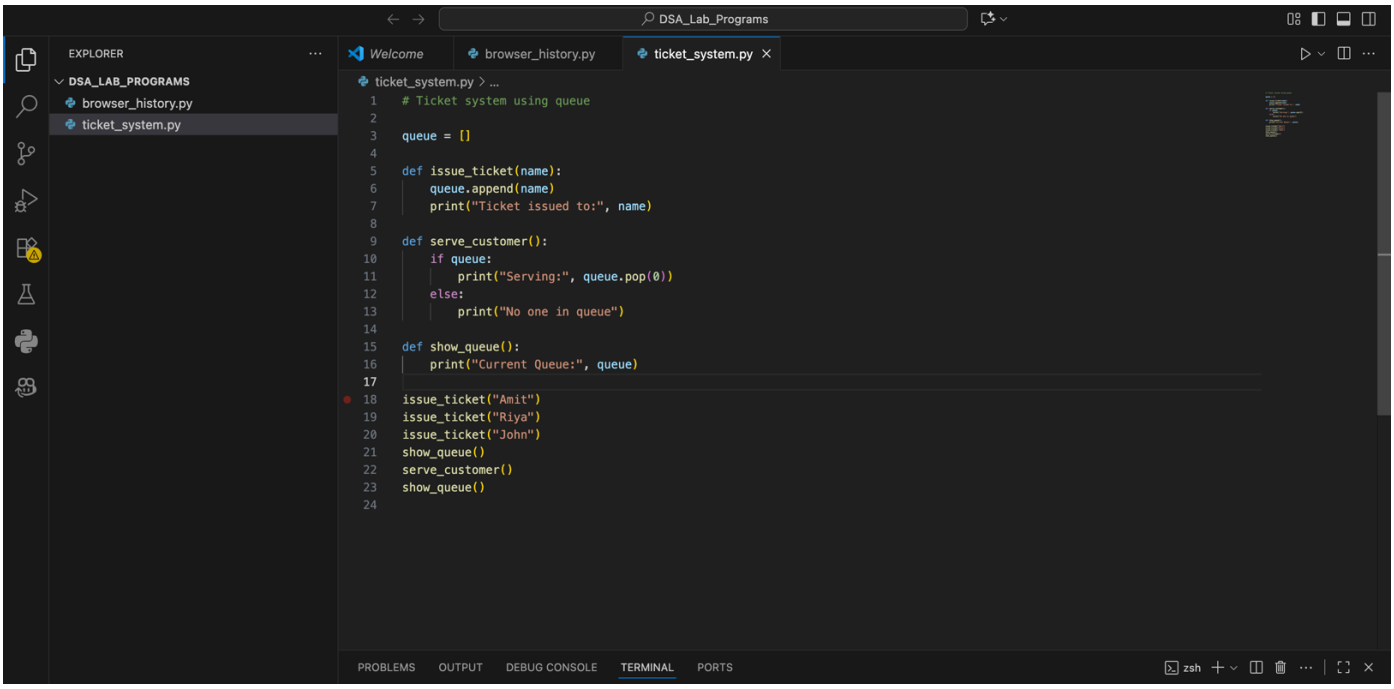
OUTPUT:-

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs % python3 filename.py

ms/filename.py': [Errno 2] No such file or directory
(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs % python3 browser_history.py

Visited: Google
Visited: YouTube
Visited: Instagram
Back to: YouTube
Back to: Google
Forward to: YouTube
(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs %
```

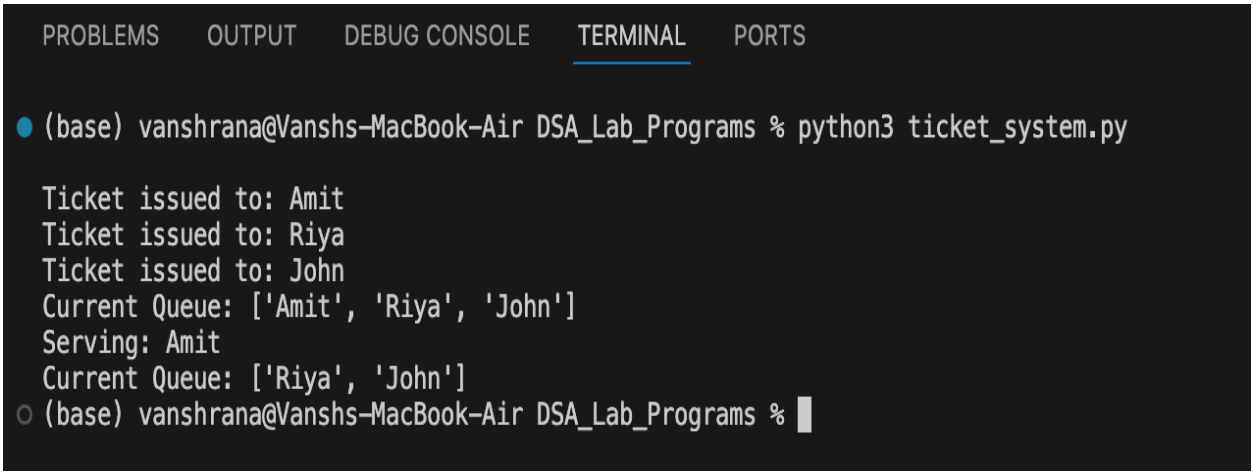
EXPERIMENT 2

Ticketing System Using Queue (Linear Queue Implementation)

CODE:-



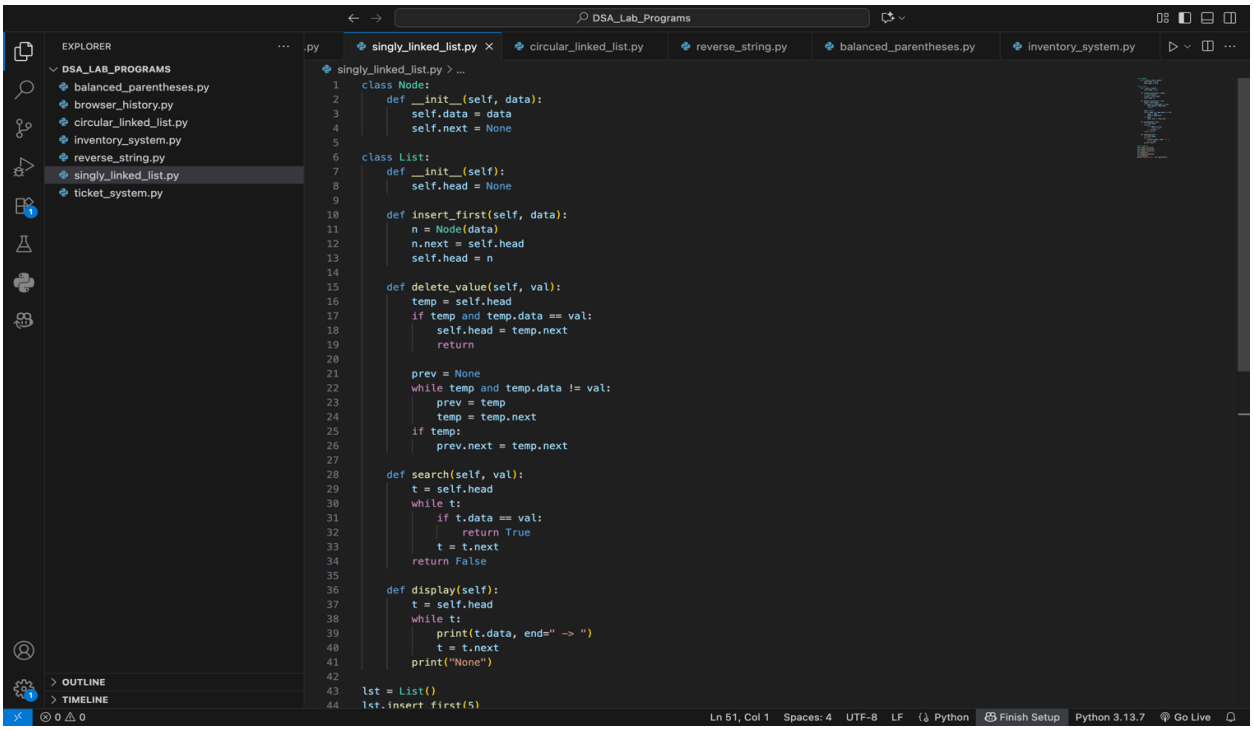
OUTPUT:-



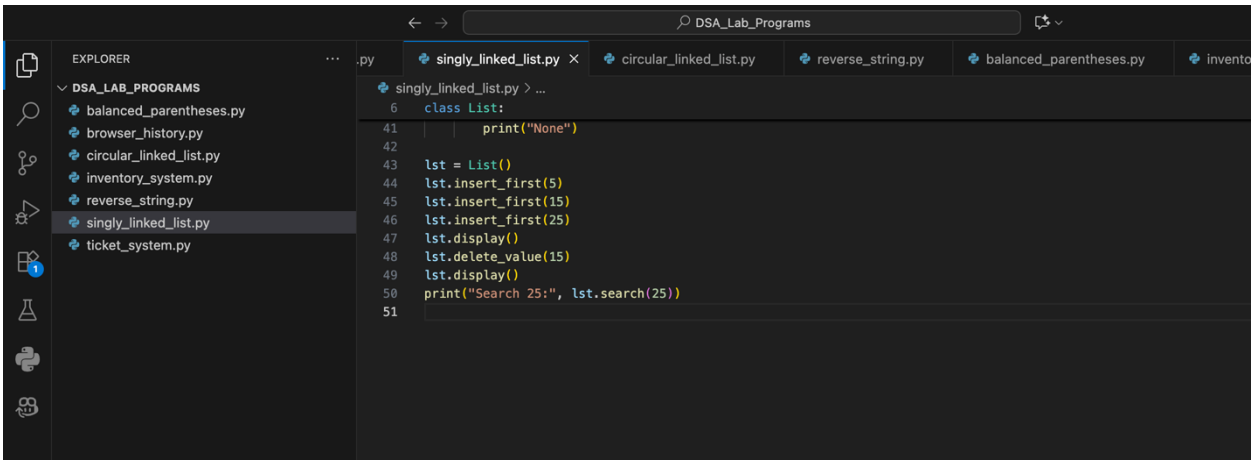
EXPERIMENT 3

Ticketing System Using Queue (Linear Queue Implementation)

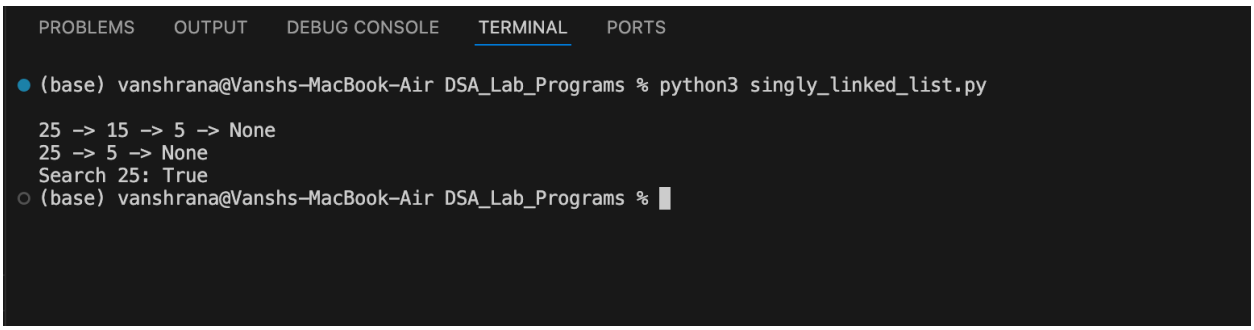
CODE:-




```python
class Node:
    def __init__(self, data):
        self.data = data
        self.next = None

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

    def insert_first(self, data):
        n = Node(data)
        n.next = self.head
        self.head = n

    def delete_value(self, val):
        temp = self.head
        if temp and temp.data == val:
            self.head = temp.next
            return

        prev = None
        while temp and temp.data != val:
            prev = temp
            temp = temp.next
        if temp:
            prev.next = temp.next

    def search(self, val):
        t = self.head
        while t:
            if t.data == val:
                return True
            t = t.next
        return False

    def display(self):
        t = self.head
        while t:
            print(t.data, end=" -> ")
            t = t.next
        print("None")

lst = List()
lst.insert_first(5)
lst.insert_first(15)
lst.insert_first(25)
lst.display()
lst.delete_value(15)
lst.display()
print("Search 25:", lst.search(25))
```



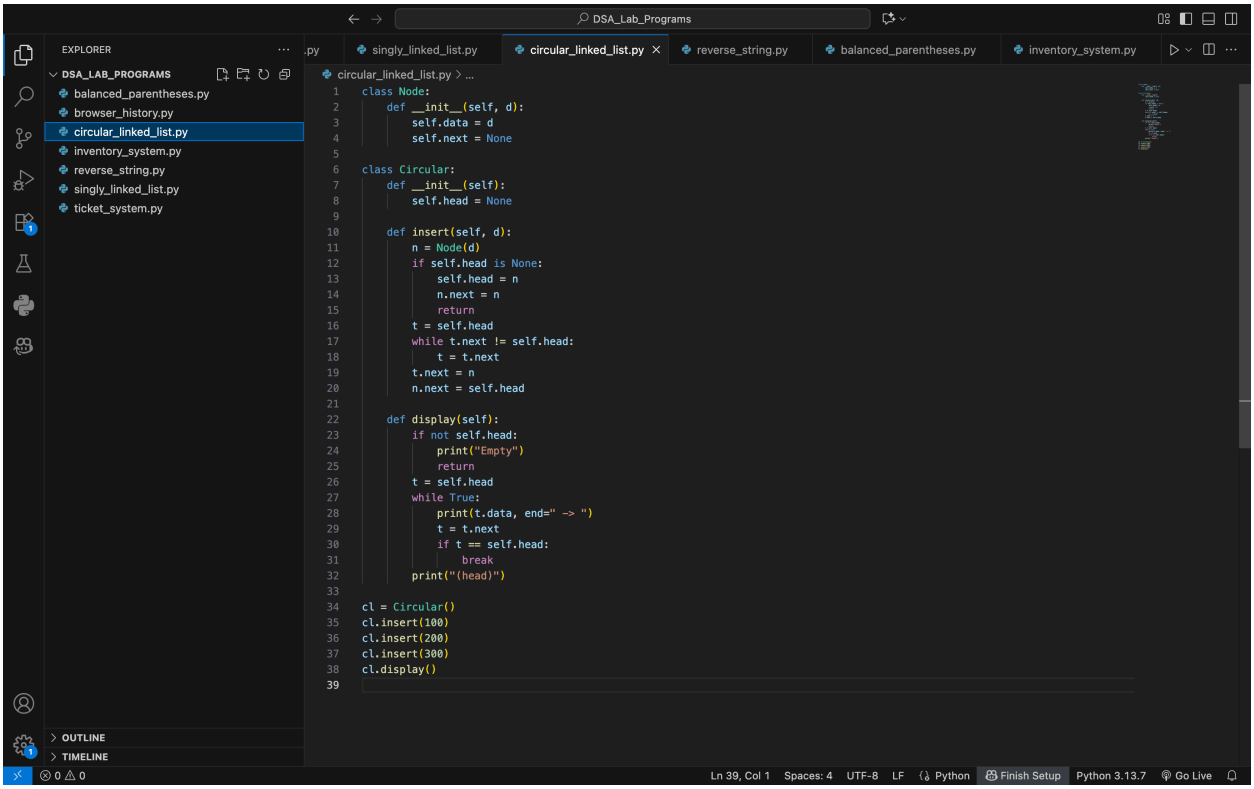
OUTPUT:-



EXPERIMENT 4

Circular Singly Linked List (Insert, Search, Delete, Display)

CODE:-




```python
class Node:
    def __init__(self, d):
        self.data = d
        self.next = None

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

    def insert(self, d):
        n = Node(d)
        if self.head is None:
            self.head = n
            n.next = n
            return
        t = self.head
        while t.next != self.head:
            t = t.next
        t.next = n
        n.next = self.head

    def display(self):
        if not self.head:
            print("Empty")
            return
        t = self.head
        while True:
            print(t.data, end=" -> ")
            t = t.next
            if t == self.head:
                break
        print("(head)")

cl = Circular()
cl.insert(100)
cl.insert(200)
cl.insert(300)
cl.display()
```

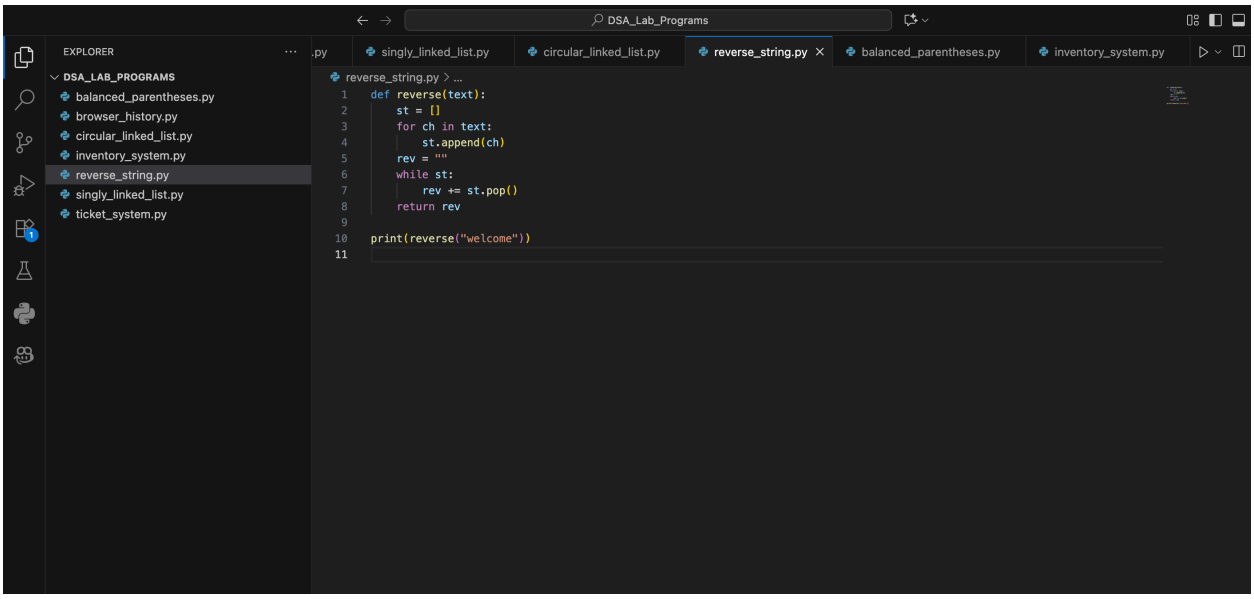
OUTPUT:-

```
(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs % python3 circular_linked_list.py

100 -> 200 -> 300 -> (head)
(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs %
```

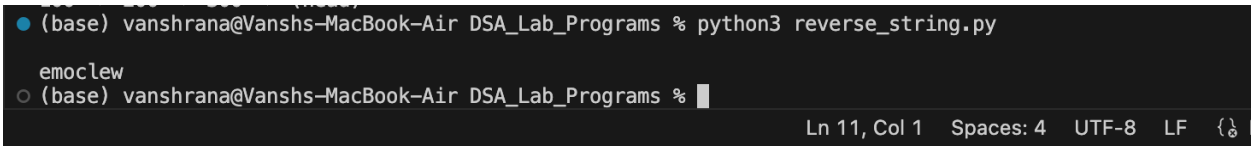
EXPERIMENT 5

Reverse a String Using Stack

CODE:-



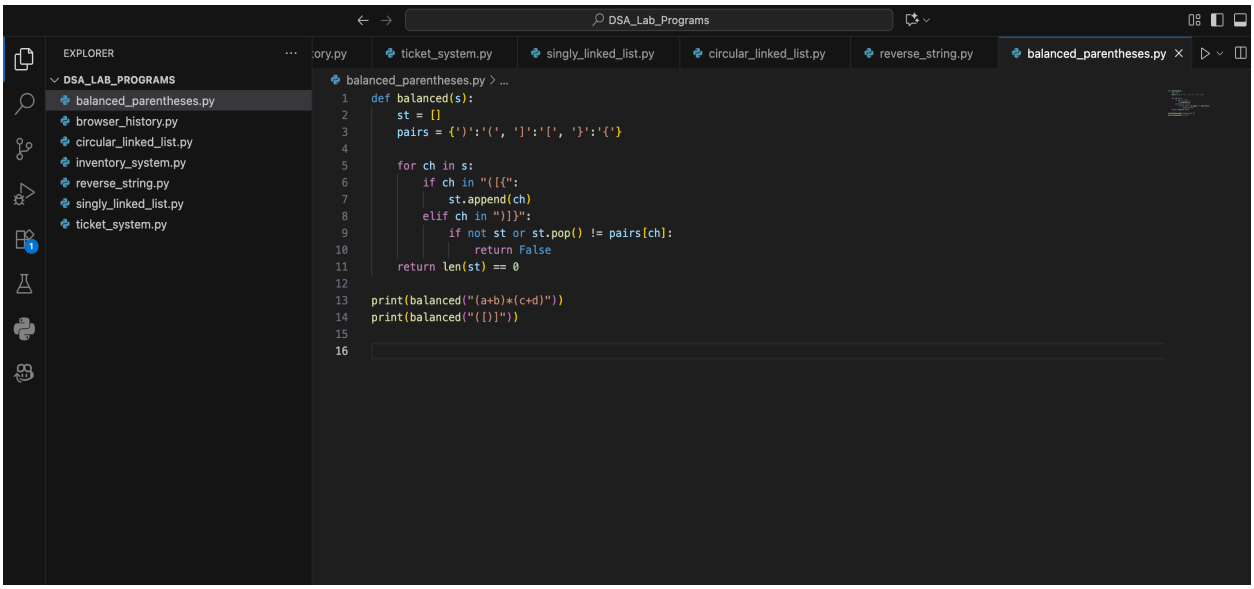
OUTPUT:-



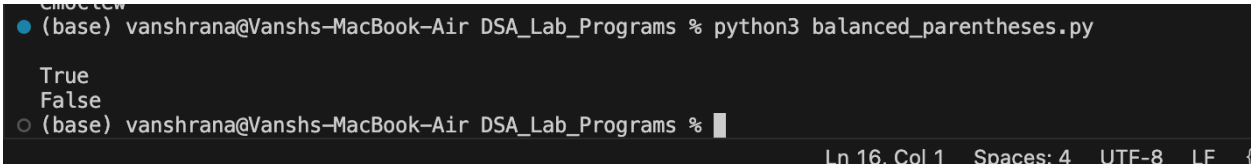
EXPERIMENT 6

Check Balanced Parentheses Using Stack

CODE:-


DSA_Lab_Programs
EXPLORER
DSA_LAB_PROGRAMS
balanced_parentheses.py
browser_history.py
circular_linked_list.py
inventory_system.py
reverse_string.py
singly_linked_list.py
ticket_system.py
ticket_system.py
singly_linked_list.py
circular_linked_list.py
reverse_string.py
balanced_parentheses.py
balanced_parentheses.py > ...
def balanced(s):
st = []
pairs = {')':'(', ']':'[', '}':'{'}
for ch in s:
if ch in "([{":
st.append(ch)
elif ch in ")]}":
if not st or st.pop() != pairs[ch]:
return False
return len(st) == 0
print(balanced("(a+b)*(c+d)"))
print(balanced("([)]"))

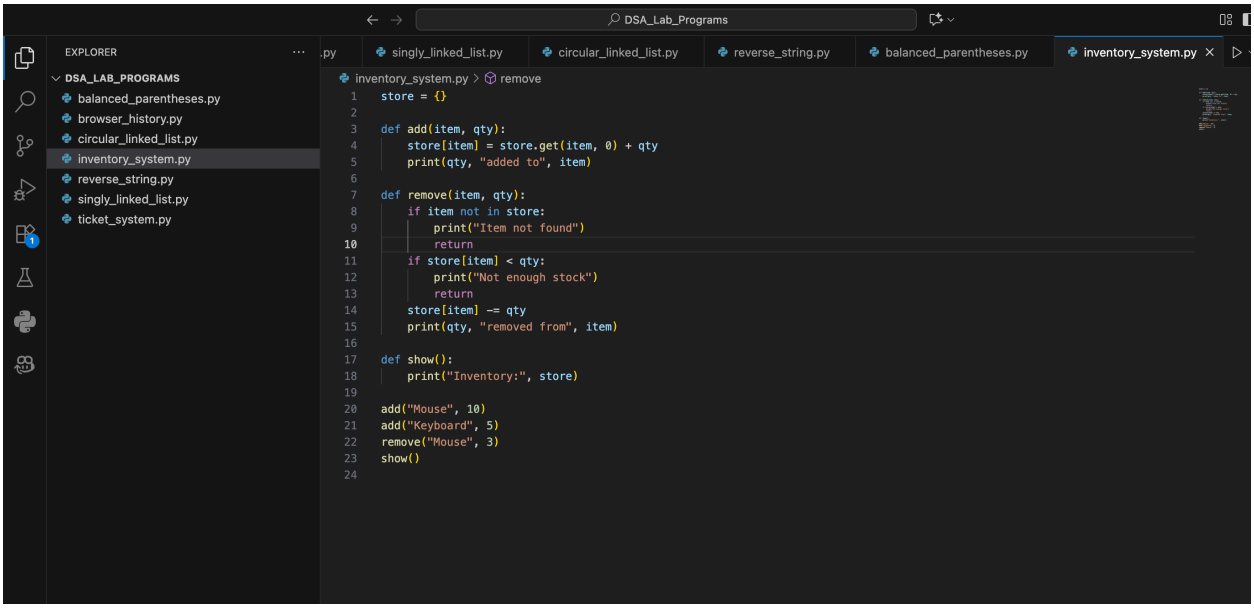
OUTPUT:-


(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs % python3 balanced_parentheses.py
True
False
(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs %
Ln 16, Col 1
Spaces: 4
UTF-8
LF

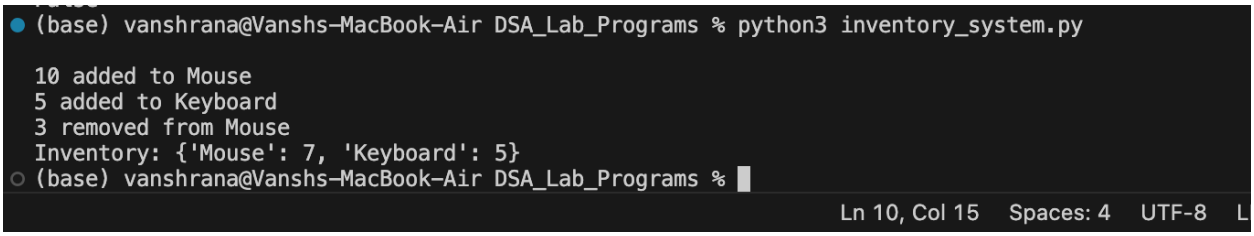
EXPERIMENT 7

Check Balanced Parentheses Using Stack

CODE:-



OUTPUT:-


(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs % python3 inventory_system.py
10 added to Mouse
5 added to Keyboard
3 removed from Mouse
Inventory: {'Mouse': 7, 'Keyboard': 5}
(base) vanshrana@Vanshs-MacBook-Air DSA_Lab_Programs %
Ln 10, Col 15
Spaces: 4
UTF-8