Program –

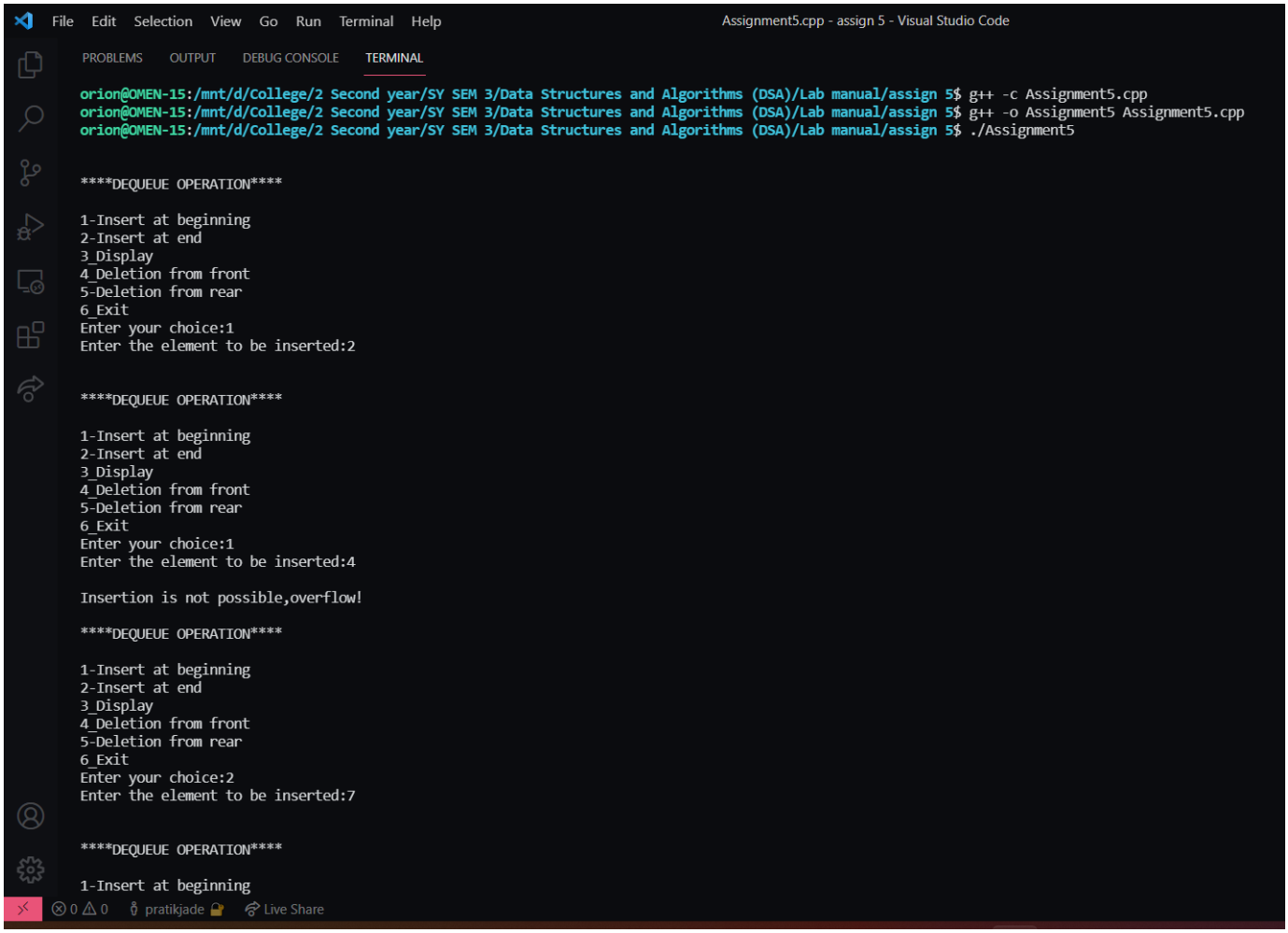
```
#include <iostream>
using namespace std;
#define SIZE 5
class dequeue
{
    int a[10], front, rear, count;

public:
    dequeue();
    void add_at_beg(int);
    void add_at_end(int);
    void delete_fr_front();
    void delete_fr_rear();
    void display();
};
dequeue::dequeue()
{
    front = -1;
    rear = -1;
    count = 0;
}
void dequeue::add_at_beg(int item)
{
    int i;
    if (front == -1)
    {
        front++;
        rear++;
        a[rear] = item;
        count++;
    }
    else if (rear >= SIZE - 1)
    {
        cout << "\nInsertion is not possible,overflow!";
    }
    else
    {
        cout << "\nInsertion is not possible,overflow!";
        for (i = count; i >= 0; i--)
        {
            a[i] = a[i - 1];
        }
        a[i] = item;
        count++;
        rear++;
    }
}
void dequeue::add_at_end(int item)
{
    if (front == -1)
    {
        front++;
        rear++;
```

```
        a[rear] = item;
        count++;
    }
    else if (rear >= SIZE - 1)
    {
        cout << "\nInsertion is not possible,overflow!";
        return;
    }
    else
    {
        a[++rear] = item;
    }
}
void dequeue::display()
{
    for (int i = front; i <= rear; i++)
    {
        cout << a[i] << "\n";
    }
}
void dequeue::delete_fr_front()
{
    if (front == -1)
    {
        cout << "Deletion is not possible: Dequeue is empty";
        return;
    }
    else
    {
        if (front == rear)
        {
            front = rear = -1;
            return;
        }
        cout << "The deleted element is " << a[front];
        front = front + 1;
    }
}
void dequeue::delete_fr_rear()
{
    if (front == -1)
    {
        cout << "Deletion is not possible: Dequeue is empty";
        return;
    }
    else
    {
        if (front == rear)
        {
            front = rear = -1;
        }
        cout << "The deleted element is " << a[rear];
        rear = rear - 1;
    }
}
```

```
int main()
{
    int c, item;
    dequeue d1;
    do
    {
        cout << "\n\n****DEQUEUE OPERATION****\n";
        cout << "\n1-Insert at beginning";
        cout << "\n2-Insert at end";
        cout << "\n3_Display";
        cout << "\n4_Deletion from front";
        cout << "\n5-Deletion from rear";
        cout << "\n6_Exit";
        cout << "\nEnter your choice:";
        cin >> c;
        switch (c)
        {
        case 1:
            cout << "Enter the element to be inserted:";
            cin >> item;
            d1.add_at_beg(item);
            break;
        case 2:
            cout << "Enter the element to be inserted:";
            cin >> item;
            d1.add_at_end(item);
            break;
        case 3:
            d1.display();
            break;
        case 4:
            d1.delete_fr_front();
            break;
        case 5:
            d1.delete_fr_rear();
            break;
        case 6:
            exit(1);
            break;
        default:
            cout << "Invalid choice";
            break;
        }
    } while (c != 7);
    return 0;
}
```

Output-


File Edit Selection View Go Run Terminal Help
Assignment5.cpp - assign 5 - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
orion@OMEN-15:/mnt/d/College/2 Second year/SY SEM 3/Data Structures and Algorithms (DSA)/Lab manual/assign 5$ g++ -c Assignment5.cpp
orion@OMEN-15:/mnt/d/College/2 Second year/SY SEM 3/Data Structures and Algorithms (DSA)/Lab manual/assign 5$ g++ -o Assignment5 Assignment5.cpp
orion@OMEN-15:/mnt/d/College/2 Second year/SY SEM 3/Data Structures and Algorithms (DSA)/Lab manual/assign 5$ ./Assignment5
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
3_Display
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:1
Enter the element to be inserted:2
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
3_Display
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:1
Enter the element to be inserted:4
Insertion is not possible,overflow!
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
3_Display
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:2
Enter the element to be inserted:7
****DEQUEUE OPERATION****
1-Insert at beginning
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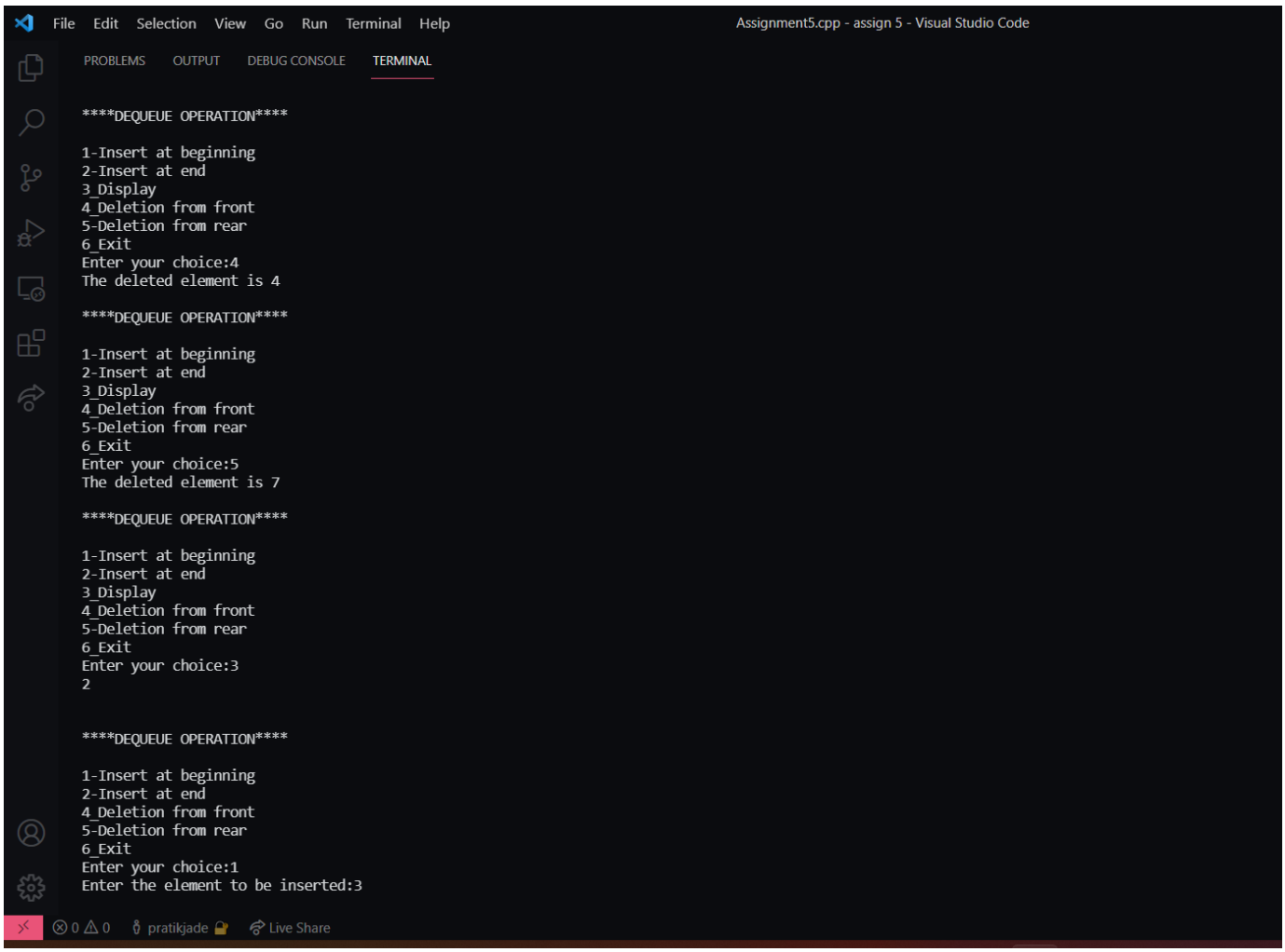
File Edit Selection View Go Run Terminal Help
Assignment5.cpp - assign 5 - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
3_Display
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:4
The deleted element is 4
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
3_Display
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:5
The deleted element is 7
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
3_Display
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:3
2
****DEQUEUE OPERATION****
1-Insert at beginning
2-Insert at end
4_Deletion from front
5-Deletion from rear
6_Exit
Enter your choice:1
Enter the element to be inserted:3
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