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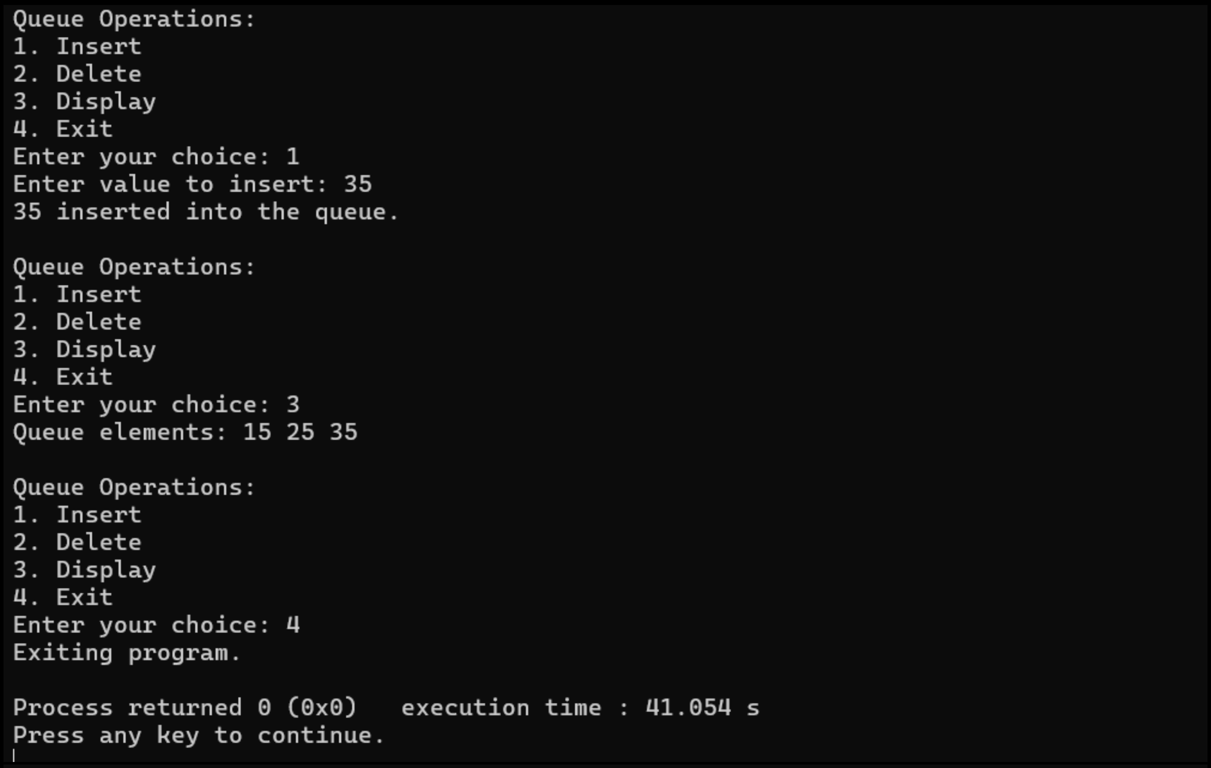
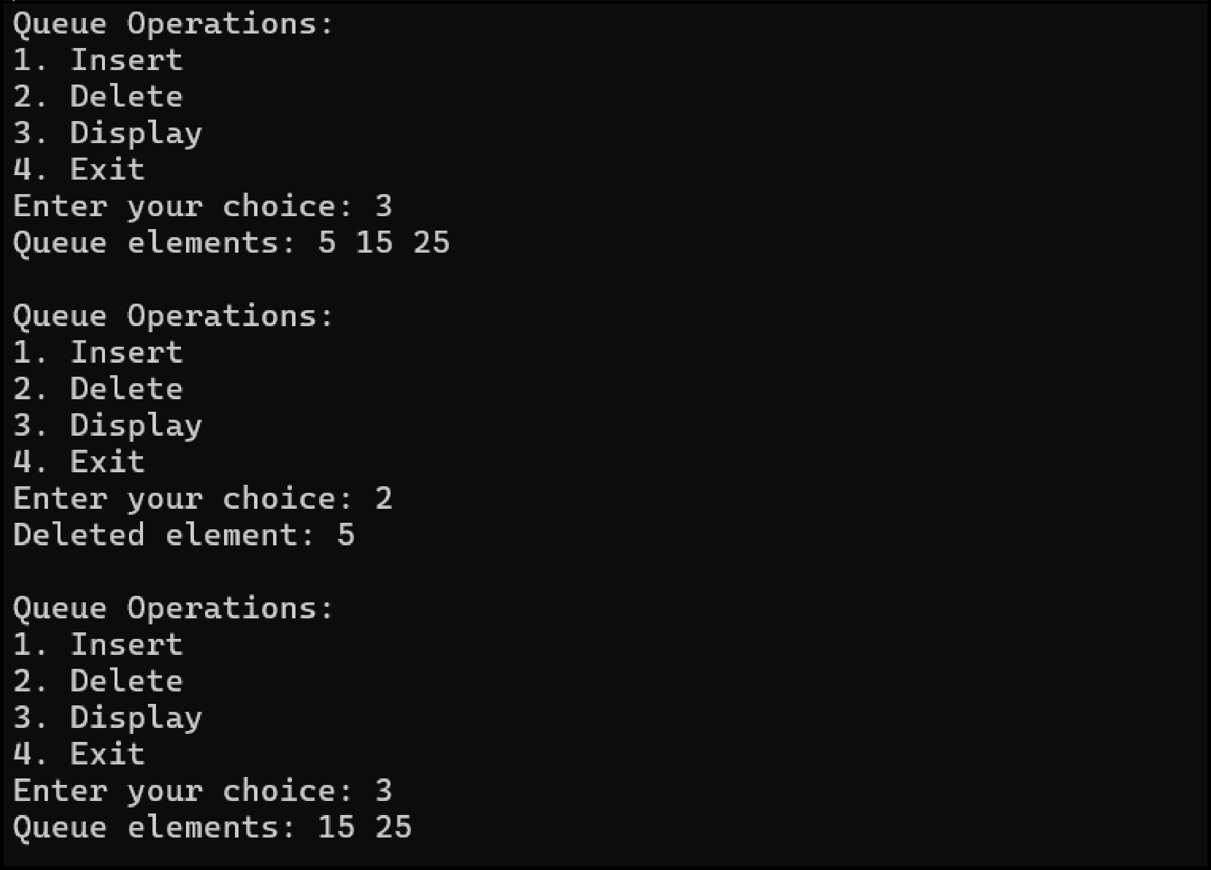
PROGRAM 3B – CIRCULAR QUEUE IMPLEMENTATION

```c
#include <stdio.h>
#define MAX 5

int queue[MAX];
int front = -1, rear = -1;

void insert(int value) {
    if ((front == 0 && rear == MAX - 1) || (front == (rear + 1) % MAX)) {
        printf("Queue Overflow! Cannot insert %d\n", value);
    } else {
        if (front == -1) {
            front = 0;
            rear = 0;
        } else {
            rear = (rear + 1) % MAX;
        }
        queue[rear] = value;
        printf("%d inserted into the queue.\n", value);
    }
}

void delete() {
    if (front == -1) {
        printf("Queue Underflow! Queue is empty.\n");
    } else {
        printf("Deleted element: %d\n", queue[front]);
        if (front == rear) {
            front = -1;
            rear = -1;
        } else {
            front = (front + 1) % MAX;
        }
    }
}
```

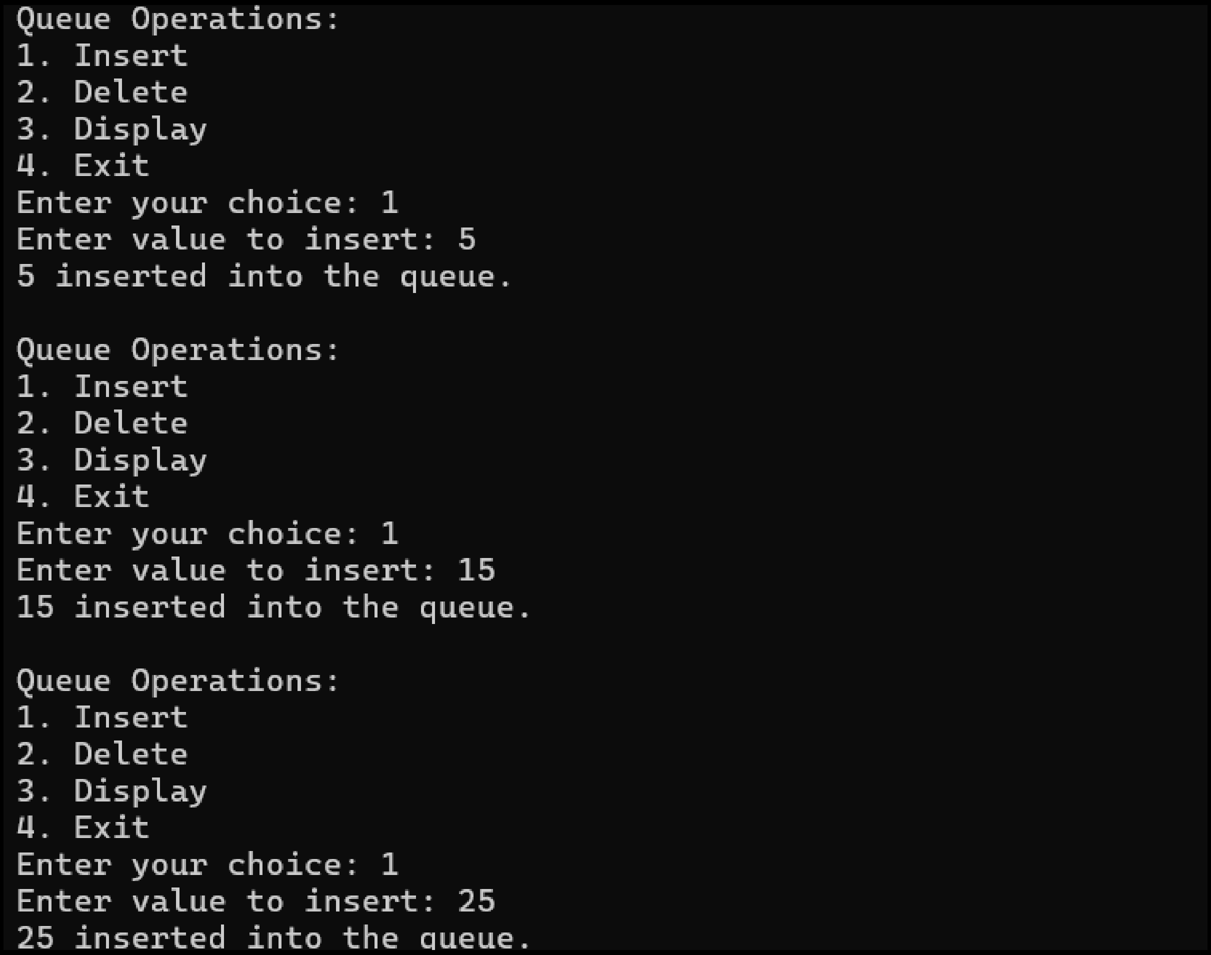
```c
void display() {
    if (front == -1) {
        printf("Queue is empty.\n");
    } else {
        printf("Queue elements: ");
        int i = front;
        while (1) {
            printf("%d ", queue[i]);
            if (i == rear)
                break;
            i = (i + 1) % MAX;
        }
        printf("\n");
    }
}

int main() {
    int choice, value;
    while (1) {
        printf("\nCircular Queue Operations:\n");
        printf("1. Insert\n");
        printf("2. Delete\n");
        printf("3. Display\n");
        printf("4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);
        switch (choice) {
            case 1:
                printf("Enter value to insert: ");
                scanf("%d", &value);
                insert(value);
                break;
            case 2:
                delete();
                break;
            case 3:
                display();
                break;
            case 4:
                printf("Exiting program.\n");
                return 0;
            default:
                printf("Invalid choice! Please try again.\n");
        }
    }
    return 0;
}
```



```
Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter value to insert: 35
35 inserted into the queue.

Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 3
Queue elements: 15 25 35

Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 4
Exiting program.

Process returned 0 (0x0)   execution time : 41.054 s
Press any key to continue.
```



```
Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 3
Queue elements: 5 15 25

Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 2
Deleted element: 5

Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 3
Queue elements: 15 25
```


```
Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter value to insert: 5
5 inserted into the queue.

Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter value to insert: 15
15 inserted into the queue.

Queue Operations:
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter value to insert: 25
25 inserted into the queue.
```