Experiment 3.1

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Subject Name:Data Structure Lab   **Subject Code:20CSP-212**

Q1.   Write a program to demonstrate the implementation of various operations on a queue represented using a linear linked list (linked queue).

1) Aim/Overview of the practical:

To write a program to demonstrate the implementation of various operations on a queue represented using a linear linked list (linked queue).

2) Software required:

Vs Code

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3) Source Code:

```cpp
#include <iostream>
using namespace std;

struct Node
{
    int data;
    struct Node *next;
} *front = NULL, *rear = NULL;

void insert(int);
void delte ();
void display();

int main()
{
    int choice, value;

    printf("\n:: Queue Implementation using Linked List ::\n");
    while (1)
    {
        printf("\n****** MENU ******\n");
        printf("1. Insert\n2. Delete\n3. Display\n4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);
        switch (choice)
        {
        case 1:
            printf("Enter the value to be insert: ");
            scanf("%d", &value);
            insert(value);
            break;
        case 2:
            delte ();
            break;
        case 3:
            display();
            break;
        case 4:
            exit(1);
        default:
            printf("\n Wrong selection!!!"
            "\n Make your choice properly !!!"
            "\n Please try again!!!\n");
        }
    }
}
```

```c
void insert(int value)
{
    struct Node *newNode;
    newNode = (struct Node *)malloc(sizeof(struct Node));
    newNode->data = value;
    newNode->next = NULL;
    if (front == NULL)
        front = rear = newNode;
    else
    {
        rear->next = newNode;
        rear = newNode;
    }
    printf("\nInsertion is Successful!!!\n");
}
void delte ()
{
    if (front == NULL)
        printf("\nThe Queue is Empty!!!\n");
    else
    {
        struct Node *temp = front;
        front = front->next;
        printf("Deletion is Successfull!!!");
        printf("\nDeleted element: %d\n", temp->data);
        free(temp);
    }
}
void display()
{
    if (front == NULL)
        printf("\nThe Queue is Empty!!!\n");
    else
    {
        struct Node *temp = front;
        while (temp->next != NULL)
        {
            printf("%d-->", temp->data);
            temp = temp->next;
        }
        printf("%d-->NULL\n", temp->data);
    }
}
```

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4. Output:

```
:: Queue Implementation using Linked List ::

****** MENU ******
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter the value to be insert: 3

Insertion is Successful!!!

****** MENU ******
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter the value to be insert: 7

Insertion is Successful!!!

****** MENU ******
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 1
Enter the value to be insert: 9

Insertion is Successful!!!

****** MENU ******
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 3
3-->7-->9-->NULL

****** MENU ******
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 2
Deletion is Successfull!!!
Deleted element: 3

****** MENU ******
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 4
```