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COURSE NAME: DATA STRUCTURES FOR MODERN COMPUTING SYSTEMS

COURSE CODE: CSA0302

Experiment 18: Implementation of Queue using Linked List

Code:

```
#include <stdio.h>
#include <stdlib.h>

struct Node {
   int data;
   struct Node* next;
};

struct Node *front = NULL, *rear = NULL;

void enqueue() {
   int value;
   struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
   if(!newNode) {
      printf("Memory not available\n");
      return;
   }
   printf("Enter value to enqueue: ");
   scanf("%d", &value);
   newNode->data = value;
   newNode->next = NULL;
   if(rear == NULL) {
      front = rear = newNode;
   } else {
```

```
        rear->next = newNode;
        rear = newNode;
    }
    printf("Value inserted successfully\n");
}

void dequeue() {
    if(front == NULL) {
        printf("Queue Underflow\n");
        return;
    }
    struct Node* temp = front;
    printf("Deleted element: %d\n", front->data);
    front = front->next;
    if(front == NULL)
        rear = NULL;
    free(temp);
}

void display() {
    struct Node* temp = front;
    if(front == NULL) {
        printf("Queue is empty\n");
        return;
    }
    printf("Queue elements:\n");
    while(temp != NULL) {
        printf("%d ", temp->data);
        temp = temp->next;
    }
    printf("\n");
```

```
}

int main() {
    int choice;
    while(1) {
        printf("\n--- Queue Menu ---\n");
        printf("1. Enqueue\n2. Dequeue\n3. Display\n4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);
        switch(choice) {
            case 1: enqueue(); break;
            case 2: dequeue(); break;
            case 3: display(); break;
            case 4: exit(0);
            default: printf("Invalid choice\n");
        }
    }
}
```

Output:

```
--- Queue Menu ---
1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 1
Enter value to enqueue: 20
Value inserted successfully

--- Queue Menu ---
1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 3
Queue elements:
20

--- Queue Menu ---
1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 2
Deleted element: 20

--- Queue Menu ---
1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 4
```