EXPERIMENT 7

Queue Implementation Using Linked List

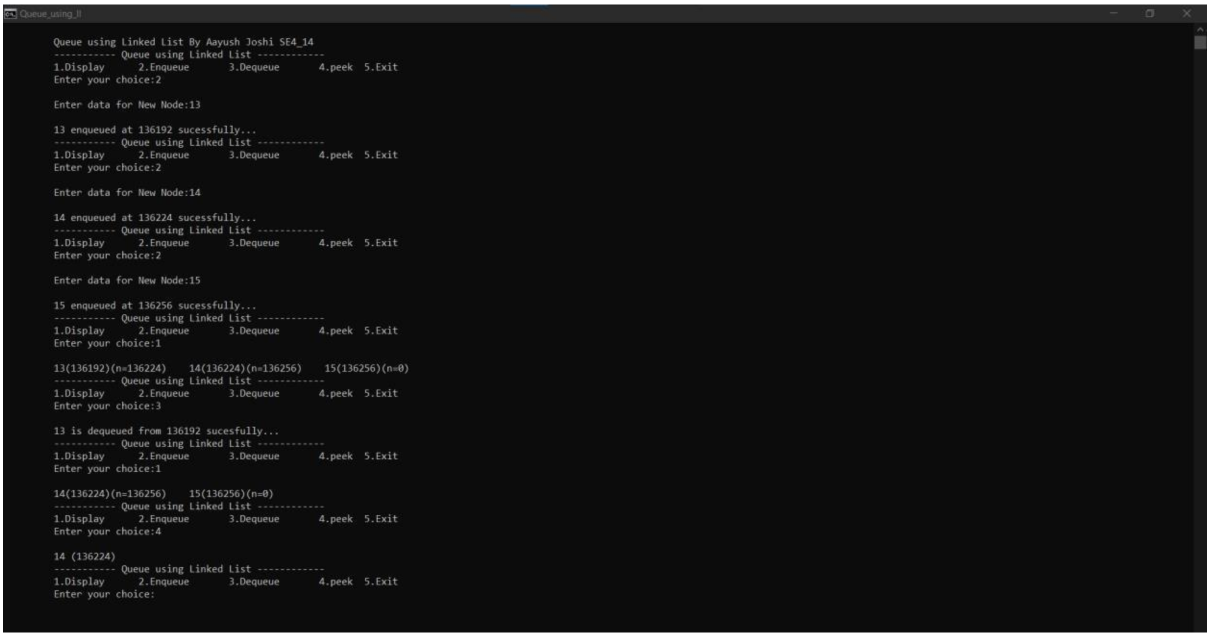
Program:

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

typedef struct qnode
{
        int data;   struct
qnode *next;
}qnode;

qnode *front=NULL;
qnode *rear=NULL;

void enqueue(); // rear
void dequeue(); // front
void display(); int
peek();

void main()
{
 printf("\n\t Queue using Linked List By Aayush Joshi
SE4_14");
        int ch;
while(1)
        {
               printf("\n\t ----------- Queue using Linked List ---------
---");
                printf("\n\t
1.Display\t2.Enqueue\t3.Dequeue\t4.peek\t5.Exit");
        printf("\n\t Enter your choice:");
scanf("%d",&ch);           switch(ch)
                {
                        case 1:display();break;
                case 2:enqueue();break;
                case 3:dequeue();break;
                case 4:peek();break;
        case 5:exit(0);
default:
                                   printf("\n\t Enter choice between 1-4...");
                }
        }
}
```

```
void enqueue()
{
        qnode *p;
        p=(qnode *)malloc(sizeof(qnode));
printf("\n\t Enter data for New Node:");
scanf("%d",&(p->data));        p-
>next=NULL;

        // now check Queue is empty or not?
if(rear==NULL && front==NULL)
        {
rear=p;
front=p;
        }
        else  // Q is not empty
        {
                rear->next=p;
rear=p;
        }
 printf("\n\t %d enqueued at %u sucessfully...", p>data,p);
}
```

```
void dequeue()
{
        qnode *p;
p=front;
if(front==NULL)
        {
  printf("\n\t Queue is already empty.. dequeue not possible");
        }
        else
        {
                front=front->next;
                printf("\n\t %d is dequeued from %u
sucesfully...",p->data,p);
                free(p);
        }
}


void display()
{
        qnode *p;
p=front;
if(front==NULL)
        {
                printf("\n\t Queue is empty.");
        }
        else
        {
                printf("\n");
while(p!=NULL)
                {
                        printf("\t %d(%u)(n=%u) ",p->data,p,p->next);
                        p=p->next;
                }
        }
}

int peek()
{
      if(front != NULL)
        {
                printf("\n\t %d (%u)",front->data,front);
        }
        else
        {
                printf("\n\t Queue is empty");
        }
}
```

Output:



```
        Queue using Linked List By Aayush Joshi SE4_14
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:2

        Enter data for New Node:13

        13 enqueued at 136192 sucessfully...
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:2

        Enter data for New Node:14

        14 enqueued at 136224 sucessfully...
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:2

        Enter data for New Node:15

        15 enqueued at 136256 sucessfully...
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:1

        13(136192)(n=136224)    14(136224)(n=136256)    15(136256)(n=0)
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:3

        13 is dequeued from 136192 sucesfully...
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:1

        14(136224)(n=136256)    15(136256)(n=0)
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:4

        14 (136224)
        ----------- Queue using Linked List ------------
        1.Display      2.Enqueue       3.Dequeue       4.peek  5.Exit
        Enter your choice:
```