queue-using-linked-list.c

```
//write a program to implement queue using linked list.
#include <stdio.h>
#include <stdlib.h>

typedef struct Queue{
   int data;
   struct Queue *next;
}queue;

int len(queue *q){
   int count = 0;
   while(q){
      q = q->next;
      count++;
   }
   return count;
}

int isEmpty(queue *q){
   return (q == NULL);
}

void enqueue(queue **q, int data){
   queue *new_node = (queue*)malloc(sizeof(queue));
   new_node->data = data;
   new_node->next = *q;
   *q = new_node;
}

int dequeue(queue **q){
   if(isEmpty(*q)){
      return -1;
   }
   if (!(*q)->next) {
      int data = (*q)->data;
      *q = NULL;
      return data;
   }
   queue *temp = *q;
   while (temp->next->next) {
      temp = temp->next;
   }
   int data = temp->next->data;
   free(temp->next);
   temp->next = NULL;
   return data;
}

void display(queue *q){
   while(q){
      printf("%d ",q->data);
      q = q->next;
   }
   printf("\n");
}
```

```
void main(){
   queue *q1 = NULL;
   if(isEmpty(q1)){
      printf("The queue is empty.\n");
   }else{
      printf("The queue is not empty.\n");
   }
   printf("the length of the queue is %d\n",len(q1));
   enqueue(&q1,10);
   printf("the length of the queue is %d\n",len(q1));
   enqueue(&q1,102);
   enqueue(&q1,15);
   enqueue(&q1,13);
   enqueue(&q1,12);
   display(q1);
   printf("the length of the queue is %d\n",len(q1));
   dequeue(&q1);
   dequeue(&q1);
   dequeue(&q1);
   display(q1);
}
```

OUTPUT

```
PS S:\WorkSpace\CollegeWork\DataStructure\Temp> gcc .\queue-using-linked-list.c
PS S:\WorkSpace\CollegeWork\DataStructure\Temp> ./a
The queue is empty.
the length of the queue is 0
the length of the queue is 1
12 13 15 102 10
the length of the queue is 5
12 13
PS S:\WorkSpace\CollegeWork\DataStructure\Temp>
```