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//Created By Ritwik Chandra Pandey
//183215
//Double Ended Queue(LL)

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

struct queue {
   int data;
   struct queue *next;
};
typedef struct queue *DeQueue;
DeQueue front = NULL, rear = NULL;
void push(int ele) {
   DeQueue temp;
   temp = (DeQueue)malloc(sizeof(DeQueue));
   if(temp==NULL){
      printf("Dequeue is overflow.\n");
      return;
   }else{
      temp->data = ele;
      temp->next= front;
      front = temp;
   }
   printf("Successfully inserted at front side.\n");}
void pop() {
   DeQueue temp;
   if(front==NULL){
      printf("Dequeue is underflow.\n");
      return;
   }
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    temp=front;
    if(front==rear){front=rear=NULL;}else{front = front->next;}
    printf("Deleted element %d from the front side.\n",temp->data);
    free(temp);
}

void inject(int ele) {
    DeQueue temp = NULL;
    temp = (DeQueue)malloc(sizeof(struct queue));
    if(temp == NULL) {
        printf("Dequeue is overflow.\n");
    } else {
        temp -> data = ele;
        temp -> next = NULL;
        if(front == NULL) {
            front = temp;
        } else {
            rear -> next = temp;}
        rear =temp;
        printf("Successfully inserted at rear side.\n");
    }
}

void eject() {
    DeQueue temp = NULL;
    if(rear == NULL) {
        printf("Dequeue is underflow.\n");
    } else {
        temp = front;
        if (front == rear) {front = rear = NULL;} else {
            while(temp -> next != rear) {
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            temp = temp -> next;}
        rear=temp;temp = rear -> next;
        rear->next = NULL;}
    printf("Deleted element %d from the rear side.\n", temp -> data);
    free(temp);}}

void display() {
  if(front == NULL) {
    printf("Double ended queue is empty.\n");
  } else {    DeQueue temp = front; printf("Elements in the double ended queue : \n");
    while(temp != NULL) { printf("%d ", temp -> data);temp = temp -> next;
    }    printf("\n");}}

int main(){
  int x,op;
  while(1){
    printf("1.Inject 2.Eject 3.Push 4.Pop 5.Display 6.Exit\n");
    printf("Enter your option : ");
    scanf("%d", &op);
    switch(op){
      case 1: printf("Enter an element : ");
        scanf("%d",&x);
        inject(x); break;
      case 2: eject();break;
      case 3: printf("Enter an element : ");scanf("%d",&x); push(x);break;
      case 4: pop(); break;
      case 5: display(); break;
      case 6: exit(0);}}}
```