Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 4_CY

Attempt : 1
Total Mark : 30
Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

Sara builds a linked list-based queue and wants to dequeue and display all positive even numbers in the queue. The numbers are added at the end of the queue.

Help her by writing a program for the same.

Input Format

The first line of input consists of an integer N, representing the number of elements Sara wants to add to the queue.

The second line consists of N space-separated integers, each representing an element to be enqueued.

Output Format

The output prints space-separated the positive even integers from the queue, maintaining the order in which they were enqueued.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
1 2 3 4 5

Output: 2 4

Answer

```
// You are using GCC
#include<stdio.h>
#include<stdlib.h>

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

typedef struct Node node;
node*front=NULL;
node*rear=NULL;
int e;
void enq(int e){
    node*nnode=(node*)malloc(sizeof(node));
    nnode->data=e;
    nnode->next=NULL;
    if(rear==NULL){
        front=rear=nnode;

    }
    else{
        rear->next=nnode;
        rear=nnode;
        }
    }
```

```
void dis(){
    node*temp=front;
    while(temp!=NULL){
        if(temp->data%2==0&&temp->data>0){
            printf("%d ",temp->data);
        }
        temp=temp->next;
    }
}


int main(){
    int a,n;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        scanf("%d",&a);
        enq(a);
    }
    dis();


}
```

Status : Correct **Marks : 10/10**

2. Problem Statement

Fathima has been tasked with developing a program to manage a queue of customers waiting in line at a service center. Help her write a program simulating a queue data structure using a linked list.

Here is a description of the scenario and the required operations:

Enqueue: Add a customer to the end of the queue.Dequeue: Remove and discard a customer from the front of the queue.Display waiting customers: Display the front and rear customer IDs in the queue.

Write a program that enqueues all the customers into the queue, performs a dequeue operation, and prints the front and rear elements.

Input Format

The first input line consists of an integer N, representing the number of customers to be inserted into the queue.

The second line consists of N space-separated integers, representing the customer IDs.

Output Format

The output prints "Front: X, Rear: Y" where X is the front element and Y is the rear element, after performing the dequeue operation.

Refer to the sample output for the exact text and format.

Sample Test Case

Input: 5
112 104 107 116 109

Output: Front: 104, Rear: 109

Answer

```
// You are using GCC
#include<stdio.h>
#include<stdlib.h>

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

node*front=NULL;
node*rear=NULL;

void enq(int e){
    node*nnode=(node*)malloc(sizeof(node));
    nnode->data=e;
    nnode->next=NULL;
    if(rear==NULL){
        front=rear=nnode;
    }
    else{
```

```
        rear->next=nnode;
        rear=nnode;
    }


}

void deq(){
    node*temp=front;
    front=front->next;
    free(temp);
}

void dis(){
    printf("Front: %d, Rear: %d",front->data,rear->data);
}
int main(){
    int a,n;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        scanf("%d",&a);
        enq(a);
    }
    deq();
    dis();
}
```

Status : Correct **Marks : 10/10**

3. Problem Statement

Manoj is learning data structures and practising queues using linked lists. His professor gave him a problem to solve. Manoj started solving the program but could not finish it. So, he is seeking your assistance in solving it.

The problem is as follows: Implement a queue with a function to find the Kth element from the end of the queue.

Help Manoj with the program.

Input Format

The first line of input consists of an integer N, representing the number of elements in the queue.

The second line consists of N space-separated integers, representing the queue elements.

The third line consists of an integer K.

Output Format

The output prints an integer representing the Kth element from the end of the queue.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
2 4 6 7 5
3
Output: 6

Answer

```
// You are using GCC
#include<stdio.h>
#include<stdlib.h>
int front=-1;
int rear=-1;
#define max 100
int arr[max];

void enq(int e)
{
   if(rear!=max-1){
      arr[++rear]=e;
   }
}

void dis(int n,int pos){
```

```
    int rev=n-pos;
    printf("%d",arr[rev]);
}


int main(){
    int e,n,pos;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        scanf("%d",&e);
        enq(e);
    }
    scanf("%d",&pos);
    dis(n,pos);

}
```

Status : Correct **Marks : 10/10**