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 : 20

Section 1 : Coding

1. 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

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

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

void enqueue(struct node**rear,struct node**front,int e){
   struct node*newn=(struct node*)malloc(sizeof(struct node));
   newn->data=e;
   newn->next=NULL;

   if(*rear==NULL){
      *front=*rear=newn;
   }
   else{
      (*rear)->next=newn;
      *rear=newn;
   }
```

```
}

int find(struct node*front,int k){
    struct node*st=front;
    struct node*nd=front;

    for(int i=0;i<k;i++){
        if(st==NULL) return -1;
        st=st->next;
    }

    while(st!=NULL){
        st=st->next;
        nd=nd->next;
    }

}

int main(){
    int n,k,e;
    struct node*front=NULL;
    struct node*rear=NULL;

    scanf("%d",&n);
    for (int i=0;i<n;i++){
        scanf("%d",&e);
        enqueue(&rear,&front,e);
    }
    scanf("%d",&k);
    int result=find(front,k);
    printf("%d",result);

    return 0;
}
```

Status : Wrong ***Marks : 0/10***

2. Problem Statement

Imagine you are developing a basic task management system for a small team of software developers. Each task is represented by an integer, where positive integers indicate valid tasks and negative integers indicate erroneous tasks that need to be removed from the queue before processing.

Write a program using the queue with a linked list that allows the team to add tasks to the queue, remove all erroneous tasks (negative integers), and then display the valid tasks that remain in the queue.

Input Format

The first line consists of an integer N, representing the number of tasks to be added to the queue.

The second line consists of N space-separated integers, representing the tasks. Tasks can be both positive (valid) and negative (erroneous).

Output Format

The output displays the following format:

For each task enqueued, print a message "Enqueued: " followed by the task value.

The last line displays the "Queue Elements after Dequeue: " followed by removing all erroneous (negative) tasks and printing the valid tasks remaining in the queue in the order they were enqueued.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
12 -54 68 -79 53

Output: Enqueued: 12
Enqueued: -54
Enqueued: 68
Enqueued: -79
Enqueued: 53
Queue Elements after Dequeue: 12 68 53

Answer

```
#include<stdio.h>
#include<stdlib.h>
typedef struct node{
   int data;
   struct node*next;
}queue;
queue*front=NULL,*rear=NULL;

void enqueue(int e){
   queue*newn=(queue*)malloc(sizeof(queue));
   newn->next=NULL;
   newn->data=e;
   if(rear==NULL){
      front=rear=newn;
   }
   else{
      rear->next=newn;
      rear=newn;
   }
   printf("Enqueued: %d\n",e);
}

void dequeue(){
   queue*pos=front;
   queue*prev=NULL;
   while(pos!=NULL)
{
   if(pos->data<0){
      queue*temp=pos;
      if(pos==front){
         front=front->next;
         if(front==NULL){
            rear=NULL;
         }
         pos=front;
      }
      else{
         prev->next=pos->next;
         if(pos==rear){
            rear=prev;
         }
         pos=prev->next;
```

```
        }
        free(temp);
    }
    else{
        prev=pos;
        pos=pos->next;
    }
    }
}

void display(){
    queue*pos=front;
    printf("Queue Elements after Dequeue: ");
    while(pos!=NULL){
        printf("%d",pos->data);
        pos=pos->next;
    }
    printf("\n");
}

int main(){
    int n,e;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        scanf("%d",&e);
        enqueue(e);
    }
    dequeue();
    display();
    return 0;
}
```

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

3. Problem Statement

Pathirana is a medical lab specialist who is responsible for managing blood count data for a group of patients. The lab uses a queue-based system to track the blood cell count of each patient. The queue structure helps in processing the data in a first-in-first-out (FIFO) manner.

However, Pathirana needs to remove the blood cell count that is positive even numbers from the queue using array implementation of queue, as they are not relevant to the specific analysis he is performing. The remaining data will then be used for further medical evaluations and reporting.

Input Format

The first line consists of an integer n, representing the number of a patient's blood cell count.

The second line consists of n space-separated integers, representing a blood cell count value.

Output Format

The output displays space-separated integers, representing the remaining blood cell count after removing the positive even numbers.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
1 2 3 4 5

Output: 1 3 5

Answer

```
#include<stdio.h>
int main(){
    int n;
    int queue[15];
    scanf("%d",&n);
    for (int i=0;i<n;i++){
        scanf("%d",&queue[i]);
    }
    for (int i=0;i<n;i++){
        if(!(queue[i]>0 && queue[i]%2==0)){
            printf("%d ",queue[i]);
        }
```

```
    }
    return 0;
}
```

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