Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 2_CY

Attempt : 1
Total Mark : 30
Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

You are required to implement a program that deals with a doubly linked list.

The program should allow users to perform the following operations:

Insertion at the End: Insert a node with a given integer data at the end of the doubly linked list.Insertion at a given Position: Insert a node with a given integer data at a specified position within the doubly linked list.Display the List: Display the elements of the doubly linked list.

Input Format

The first line of input consists of an integer n, representing the number of elements to be initially inserted into the doubly linked list.

The second line consists of n space-separated integers, denoting the elements to be inserted at the end.

The third line consists of integer m, representing the new element to be inserted.

The fourth line consists of an integer p, representing the position at which the new element should be inserted (1-based indexing).

Output Format

If p is valid, display the elements of the doubly linked list after performing the insertion at the specified position.

If p is invalid, display "Invalid position" in the first line and the second line prints the original list.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
10 25 34 48 57
35
4

Output: 10 25 34 35 48 57

Answer

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

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

void createnode(node**head,int data)
{
   node*temp= *head;
   node* newnode=(node*)malloc(sizeof(node));
```

```
    newnode->data=data;
    newnode->next=NULL;
    newnode->prev=NULL;

    if(*head==NULL)
    {
    *head=newnode;
    return;
    }
    while(temp->next!=NULL)
    {
       temp=temp->next;
    }
    temp->next=newnode;
    newnode->prev=temp;
}
void insert(node ** head,int data,int n,int m)
{
    node* temp=*head;
    node*newnode=(node*)malloc(sizeof(node));
    newnode->data=data;
    newnode->next=NULL;
    newnode->prev=NULL;
    if(*head==NULL)
    {*head=newnode;
    return;
    }
    if(n>m)
    {
    printf("Invalid position\n");
    return;
    }
    for(int i=1;i<n-1 && temp->next!=NULL;i++)
    {
       temp=temp->next;
    }
    newnode->next=temp->next;
    newnode->prev=temp;
    if(temp->next!=NULL)
    temp->next->prev=newnode;
    temp->next=newnode;
```

```
}
void display(node*head)
{
   node* temp=head;
   if(head==NULL) return;
   while(temp!=NULL)
   {
      printf("%d ",temp->data);
      temp=temp->next;
   }
}
int main()
{
   node*head=NULL;
   int data,n;
   scanf(" %d",&n);
   for(int i=0;i<n;i++)
   {
      scanf(" %d",&data);
      createnode(&head,data);
   }
   int n1,ne;
   scanf(" %d %d",&ne,&n1);
   insert(&head,ne,n1,n);

   display(head);
}
```

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

2. Problem Statement

Aarav is working on a program to analyze his test scores, which are stored in a doubly linked list. He needs a solution to input scores into the list and determine the highest score.

Help him by providing code that lets users enter test scores into the doubly linked list and find the maximum score efficiently.

Input Format

The first line consists of an integer N, representing the number of elements to be initially inserted into the doubly linked list.

The second line consists of N space-separated integers, denoting the score to be inserted.

Output Format

The output prints an integer, representing the highest score present in the list.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4
89 71 2 70

Output: 89

Answer

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

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

void createnode(node** head,int data)
{
   node*temp=*head;
   node* newnode=(node*)malloc(sizeof(node));
   newnode->data=data;
   newnode->next=NULL;
   newnode->prev=NULL;

   if((*head)==NULL)
   {
   *head=newnode;
```

```
    return;

    }
    while(temp->next!=NULL)
    {
        temp=temp->next;
    }
    temp->next=newnode;
    newnode->prev=temp;
}
void high(node* head)
{
    node* first = head;
    node* temp=head->next;
    while(temp!=NULL)
    {
        if(first->data < temp->data)
        {
        first->data=temp->data;
        }
        temp=temp->next;
    }
    printf("%d",first->data);
}
int main()
{
    node* head = NULL;
    int n,value;
    scanf("%d",&n);
    for(int i=0;i<n;i++)
    {
        scanf("%d",&value);
        createnode(&head,value);
    }
    high(head);
}
```

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

3. Problem Statement

Krishna needs to create a doubly linked list to store and display a sequence of integers. Your task is to help write a program to read a list of integers from input, store them in a doubly linked list, and then display the list.

Input Format

The first line of input consists of an integer n, representing the number of integers in the list.

The second line of input consists of n space-separated integers.

Output Format

The output prints a single line displaying the integers in the order they were added to the doubly linked list, separated by spaces.

If nothing is added (i.e., the list is empty), it will display "List is empty".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
1 2 3 4 5
Output: 1 2 3 4 5

Answer

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

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

void createnode(node** head,int data)
```

```
{
    node* temp=*head;
    node* newnode=(node*) malloc(sizeof(node));
    newnode->data=data;
    newnode->next=NULL;
    newnode->prev=NULL;

    if((*head)==NULL)
    {
        *head=newnode;
        return;
    }

    while(temp->next!=NULL)
    {
        temp=temp->next;
    }
    temp->next=newnode;
    newnode->prev=temp;
}

int main()
{
    node* head=NULL;
    int n,data;
    scanf("%d",&n);
    for(int i=0;i<n;i++)
    {
        scanf("%d",&data);
        createnode(&head,data);
    }
    if(n==0)
    {
        printf("List is empty");
    }
    else
    {
        while(head!=NULL){
            printf("%d ",head->data);
            head=head->next;
        }
```

```
    }
}
```

Status : Correct *Marks : 10/10*