#include<stdio.h>

#include<string.h>

#include<stdlib.h>

struct node{

int val;

struct node \*next;

}\*new, \*list1 = NULL, \*list2 = NULL, \*list3 = NULL;

struct node\* mergeTwoLists(struct node\* list1, struct node\* list2){

struct node\* head = NULL;

struct node\* tail = NULL;

while (list1!=NULL && list2!=NULL){

new=(struct node\*)malloc(sizeof(struct node));

if (list1->val < list2->val){

new->val = list1->val;

new->next = NULL;

if (head == NULL){

head=new;

tail=new;

}

else{

tail->next=new;

tail=tail->next;

}

list1=list1->next;

}

else{

new->val = list2->val;

new->next = NULL;

if (head == NULL){

head=new;

tail=new;

}

else{

tail->next=new;

tail=tail->next;

}

list2=list2->next;

}

}

while (list1!=NULL){

new=(struct node\*)malloc(sizeof(struct node));

new->val = list1->val;

new->next = NULL;

if (head != NULL){

tail->next=new;

tail=tail->next;

list1=list1->next;

}

else{

head=new;

tail=new;

list1=list1->next;

}

}

while (list2!=NULL){

new=(struct node\*)malloc(sizeof(struct node));

new->val = list2->val;

new->next = NULL;

if (head != NULL){

tail->next=new;

tail=tail->next;

list2=list2->next;

}

else{

head=new;

tail=new;

list2=list2->next;

}

}

return head;

}

struct node\* insert(){

struct node\* h = NULL;

struct node\* t = NULL;

int n, v, i;

printf("Enter no of values in list : ");

scanf("%d", &n);

printf("Enter values in sorted order\n");

for(i=0; i<n; i++){

new=(struct node\*)malloc(sizeof(struct node));

printf("Enter %d th value : ",i+1);

scanf("%d",&v);

new->val = v;

new->next=NULL;

if(i==0){

h=new;

t=new;

}

else{

t->next=new;

t=t->next;

}

}

return h;

}

int main(){

printf("Enter values in list 1\n");

list1 = insert();

printf("Enter values in list 2\n");

list2 = insert();

list3 = mergeTwoLists(list1,list2);

printf("Final list is: \n");

while (list3 != NULL){

printf("%d\t",list3->val);

list3=list3->next;

}

}