

```
1 #include <stdio.h>
2 #include <stdlib.h>
3
4 struct node {
5     int data;
6     struct node *next;
7 };
8
9 struct node* createNode(int x) {
10    struct node *newnode = (struct node*)malloc(sizeof(struct node));
11    newnode->data = x;
12    newnode->next = NULL;
13    return newnode;
14 }
15
16 void insertEnd(struct node **head, int x) {
17     struct node *newnode = createNode(x);
18
19     if (*head == NULL) {
20         *head = newnode;
21         return;
22     }
23
24     struct node *temp = *head;
25     while (temp->next != NULL)
26         temp = temp->next;
27
28     temp->next = newnode;
29 }
30
31 void display(struct node *head) {
32     if (head == NULL) {
33         printf("List is empty\n");
34         return;
35     }
36     while (head != NULL) {
37         printf("%d ", head->data);
38         head = head->next;
39     }
40     printf("\n");
}
```

```
void sortList(struct node **head) {
    struct node *i, *j;
    int temp;

    for (i = *head; i != NULL; i = i->next) {
        for (j = i->next; j != NULL; j = j->next) {
            if (i->data > j->data) {
                temp = i->data;
                i->data = j->data;
                j->data = temp;
            }
        }
    }
}

void reverseList(struct node **head) {
    struct node *prev = NULL, *curr = *head, *next = NULL;

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

    *head = prev;
}

struct node* concatenate(struct node *head1, struct node *head2) {
    if (head1 == NULL) return head2;
    if (head2 == NULL) return head1;

    struct node *temp = head1;
    while (temp->next != NULL)
        temp = temp->next;

    temp->next = head2;

    return head1;
}
```

```
Code: > main.c
0 int main() {
1     struct node *list1 = NULL, *list2 = NULL, *finalList;
2     int n, x;
3     printf("Enter number of elements in List 1: ");
4     scanf("%d", &n);
5
6     printf("Enter elements:\n");
7     for (int i = 0; i < n; i++) {
8         scanf("%d", &x);
9         insertEnd(&list1, x);
0     }
1
2     printf("List 1: ");
3     display(list1);
4
5
6     sortList(&list1);
7     printf("Sorted List 1: ");
8     display(list1);
9
0     reverseList(&list1);
1     printf("Reversed List 1: ");
2     display(list1);
3     printf("\nEnter number of elements in List 2: ");
4     scanf("%d", &n);
5
6     printf("Enter elements:\n");
7     for (int i = 0; i < n; i++) {
8         scanf("%d", &x);
9         insertEnd(&list2, x);
0     }
1
2     printf("List 2: ");
3     display(list2);
4     finalList = concatenate(list1, list2);
5     printf("Concatenated List: ");
6     display(finalList);
7
8     return 0;
9 }
```

```
Enter elements:  
3 4  
List 1: 3 4  
Sorted List 1: 3 4  
Reversed List 1: 4 3  
  
Enter number of elements in List 2: 3  
Enter elements:  
8 6 4  
List 2: 8 6 4  
Concatenated List: 4 3 8 6 4  
PS C:\Users\Admin\Desktop\dslab\output> []
```