

```
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;
}

```

```

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);
10     }
11
12     printf("List 1: ");
13     display(list1);
14
15
16     sortList(&list1);
17     printf("Sorted List 1: ");
18     display(list1);
19
20     reverseList(&list1);
21     printf("Reversed List 1: ");
22     display(list1);
23     printf("\nEnter number of elements in List 2: ");
24     scanf("%d", &n);
25
26     printf("Enter elements:\n");
27     for (int i = 0; i < n; i++) {
28         scanf("%d", &x);
29         insertEnd(&list2, x);
30     }
31
32     printf("List 2: ");
33     display(list2);
34     finalList = concatenate(list1, list2);
35     printf("Concatenated List: ");
36     display(finalList);
37
38     return 0;
39 }

```

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\ds1ab\output>