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Sort, Reversing and Concatenation of Linked Lists

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

struct Node {
    int data;
    struct Node *link;
};
typedef struct Node node;

node *start = NULL, *temp, *new1, *curr;
int ch;
char c;

void createList();
void sort();
void reverse();
void display();
void concatenate();

void createList() {
    do{
        new1 = (node *) malloc (sizeof (node));
        printf("Enter Value: ");
        scanf("%d", &new1->data);
        new1->link = NULL;
        if (start == NULL){
            start = new1;
            curr = new1;
        }
        else{
```

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        curr -> link = new1;
        curr = new1;
    }
    printf("Do You Want Another Element (Y/N): ");
    scanf("%c", &c);
  } while(c == 'y' || c == 'Y');
}

void sort(){
    if (start == NULL) {
        printf("The Linked List is Empty.");
        return;
    }
    node *i, *j;
    int tempData;
    for(i= start; i!=NULL; i=i-> link){
        for(j=i-> link; j!=NULL; j=j -> link){
            if (i-> data > j -> data){
                tempData = i -> data;
                i-> data = j-> data;
                j-> data = tempData;
            }
        }
    }
    printf("Linked List is Sorted");
}

void reverse(){
    node *a = start, *b=NULL;
    while (a!=NULL){
        temp = a -> link;
        a-> link = b;
```

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        b = a;
        a = temp;
    }
    start = b;
    printf("Linked list is Reversed.");
}

void display(){
    if(start == NULL){
        printf("Linked list is Empty\n");
        return;
    }
    temp = start;
    printf("Elements in Linked list: \n");
    while(temp != NULL){
        printf("%d ", temp -> data);
        temp = temp -> link;
    }
    printf("\n");
}

void concatenate(){
    node *start2 = NULL, *curr2 = NULL;
    printf("Enter the Second Linked list: \n");
    createList();

    do{
        new1 = (node *)malloc(sizeof(node));
        printf("Enter Value for 2nd list: ");
        scanf("%d", &new1->data);
        new1 -> link = NULL;
```

```
    if (start2 == NULL){
        start2 = new1;
        curr2 = new1;
    }
    else{
        curr2 -> link = new1;
        curr2 = new1;
    }
    printf("Do you want to add another element (Y/N): ");
    scanf("%c", &c);
} while(c == 'y' || c == 'Y');

if (start == null){
    start = start2;
}
else{
    temp = start;
    while(temp -> link != NULL){
        temp = temp -> link;
    }
    temp -> link = start2;
}
start2 = NULL;
printf("Lists Concatenated.");
}

void main(){
    while(1){
        printf("\n1. Create 1st linked list \n2. Sort linked list \n3. Reverse
        linked list \n4. Concatenate linked list \n5. Display linked list \n6. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &ch);
```

```
switch(ch){
    case 1: createList();
        break;
    case 2: sort();
        break;
    case 3: reverse();
        break;
    case 4: concatenate();
        break;
    case 5: display();
        break;
    case 6: exit(0);
        break;
    default: printf("Invalid choice.");
        break;
    }
  }
}
```

Output

```
1. Create 1st Linked List
2. Sort Linked List
3. Reverse Linked List
4. Concatenate Linked List
5. Display Linked List
6. Exit

→ Enter Your Choice : 1
Enter Value : 10
Do you want to add another element : y
Enter Value : 80
Do you want to add another element: y
```

Enter Value: 60
Do you want to add another element: y
Enter value: 20
Do you want to add another element: y
Enter value: 70
Do you want to add another element: y
Enter Value: 30
Do you want to add another element: n

→ Enter Your Choice: 5
Elements in Linked List:
10 80 60 20 70 30

→ Enter Your Choice: 3
Linked List is Reversed

→ Enter Your Choice: 5
Elements in Linked List:
30 70 20 60 80 10

→ Enter Your Choice: 2
Linked list is sorted

→ Enter Your Choice: 5
Elements in Linked List:
10 20 30 60 70 80

→ Enter Your Choice: 4
Enter value for 2nd list: 150
Do you want to add another element: y
Enter value for 2nd list: 50
Do you want to add another element: y

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Enter value for 2nd list: 60
Do you want to add another element: y
Enter value for 2nd list: 40
Do you want to add another element: n
Lists concatenated succesfully

→ Enter Your Choice: 5
Elements in the linked list:
10 20 30 60 70 80 10 50 60 40

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