main.c

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```c
#include<stdio.h>
#include<stdlib.h>
#include<conio.h>
struct node
{
    int info;
    struct node*link;

};
typedef struct node*NODE;
NODE getnode()
{
    NODE x;
    x=(NODE)malloc(sizeof(struct node));
    if(x==NULL)
    {
        printf("memory full\n");
        exit(0);
    }
    return x;
}
void freenode(NODE x)
{
    free(x);
}
NODE insert_front(NODE first,int item)
{
    NODE temp;
    temp=getnode();
    temp->info=item;
    temp->link=NULL;
    if(first==NULL)
    return temp;
    temp->link=first;
    first=temp;
    return first;
}
NODE delete_front(NODE first)
```

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```
}
NODE delete_front(NODE first)
{
    NODE temp;
    if(first==NULL)
    {
        printf("list is empty cannot delete\n");
        return first;
    }
    temp=first;
    temp=temp->link;
    printf("item deleted at front end is=%d \n",first->info);
    free(first);
    return temp;
}
NODE insert_rear(NODE first,int item)
{
    NODE temp,cur;
    temp=getnode();
    temp->info=item;
    temp->link=NULL;
    if(first==NULL)
    return temp;
    cur=first;
    while(cur->link!=NULL)
    cur=cur->link;
    cur->link=temp;
    return first;
}
NODE delete_rear(NODE first)
{
    NODE cur,prev;
    if(first==NULL)
    {
        printf("list is empty cannot delete\n");
        return first;
    }
    if(first->link==NULL)
```

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```
    }
    if(first->link==NULL)
    {
        printf("item deleted is %d\n",first->info);
        free(first);
        return NULL;
    }
    prev=NULL;
    cur=first;
    while(cur->link!=NULL)
    {
        prev=cur;
        cur=cur->link;
    }
    printf("item deleted at rear end is %d",cur->info);
    free(cur);
    prev->link=NULL;
    return first;
}
NODE order_list(int item,NODE first)
{
    NODE temp,prev,cur;
    temp=getnode();
    temp->info=item;
    temp->link=NULL;
    if(first==NULL) return temp;
    if(item<first->info)
    {
        temp->link=first;
        return temp;
    }
    prev=NULL;
    cur=first;
    while(cur!=NULL&&item>cur->info)
    {
       prev=cur;
       cur=cur->link;
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```
109         cur=cur->link;
110     }
111     prev->link=temp;
112     temp->link=cur;
113     return first;
114 }
115 NODE reverse(NODE first)
116 {
117     NODE cur,temp;
118     cur=NULL;
119     while(first!=NULL)
120     {
121         temp=first;
122         first=first->link;
123         temp->link=cur;
124         cur=temp;
125     }
126     return cur;
127 }
128 NODE concat(NODE first,NODE second)
129 {
130     NODE cur;
131     if(first==NULL)
132     return second;
133     if(second==NULL)
134     return first;
135     cur=first;
136     while(cur->link!=NULL)
137     cur=cur->link;
138     cur->link=second;
139     return first;
140 }
141 void display(NODE first)
142 {
143     NODE temp;
144     if(first==NULL)
145     printf("list empty cannot display items\n");
146     for(temp=first;temp!=NULL;temp=temp->link)
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```
    if(first==NULL)
    printf("list empty cannot display items\n");
    for(temp=first;temp!=NULL;temp=temp->link)
    {
        printf("%d\n",temp->info);
    }
}
void main()
{
    int item,choice,n,i;
    NODE first=NULL,a,b;
    for(;;)
    {
        printf("\n 1:Insert_front\n 2:Delete_front\n 3:Insert_rear\n 4:Delete_rear\n 5:Order_list\n 6:reverse_list\n 7:Concat_list\n 8:Display_list\n 9:EXIT\n");
        printf("enter the choice\n");
        scanf("%d",&choice);
        printf("------\n")
        switch(choice)
        {
            case 1:printf("enter the item at front end\n");
            scanf("%d",&item);
            first=insert_front(first,item);
            break;
            case 2:first=delete_front(first);
            break;
            case 3:printf("enter the item at rear end\n");
            scanf("%d",&item);
            first=insert_rear(first,item);
            break;
            case 4:first=delete_rear(first);
            break;
            case 5:printf("enter the item to be inserted in ordered_list\n");
            scanf("%d",&item);
            first=order_list(item,first);
            break;
            case 6:first=reverse(first);
            display(first);
            break;
            case 7:printf("Enter the no of nodes in 1\n");
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```
174             break;
175             case 5:printf("enter the item to be inserted in ordered_list\n");
176             scanf("%d",&item);
177             first=order_list(item,first);
178             break;
179             case 6:first=reverse(first);
180             display(first);
181             break;
182             case 7:printf("Enter the no of nodes in 1\n");
183             scanf("%d",&n);
184             a=NULL;
185             for(i=0;i<n;i++)
186             {
187                 printf("Enter the item\n");
188                 scanf("%d",&item);
189                 a=insert_rear(a,item);
190             }
191             printf("Enter the no of nodes in 2\n");
192             scanf("%d",&n);
193             b=NULL;
194             for(i=0;i<n;i++)
195             {
196                printf("Enter the item\n");
197                scanf("%d",&item);
198                b=insert_rear(b,item);
199             }
200             a=concat(a,b);
201             display(a);
202             break;
203             case 8:display(first);
204             break;
205             default:exit(0);
206             break;
207         }
208     }
209 }
```

input

```
 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
5
------
enter the item to be inserted in ordered_list
12

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
5
------
enter the item to be inserted in ordered_list
97

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
```

```
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
5
------
enter the item to be inserted in ordered_list
2

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
8
------
2
12
97

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
```

```
 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
1
------
enter the item at front end
12

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
3
------
enter the item at rear end
56

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
```

```
 8:Display_list
 9:EXIT
enter the choice
3
------
enter the item at rear end
90

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
6
------
90
56
12

 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
```

```
 1:Insert_front
 2:Delete_front
 3:Insert_rear
 4:Delete_rear
 5:Order_list
 6:reverse_list
 7:Concat_list
 8:Display_list
 9:EXIT
enter the choice
7
------
Enter the no of nodes in 1
3
Enter the item
23
Enter the item
12
Enter the item
15
Enter the no of nodes in 2
3
Enter the item
89
Enter the item
79
Enter the item
21
23
12
15
89
79
21
```