

main.c

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 struct node
4 {
5     int info;
6     struct node *link;
7 };
8 typedef struct node *NODE;
9 NODE getnode()
10 {
11     NODE x;
12     x=(NODE)malloc(sizeof(struct node));
13     if(x==NULL)
14     {
15         printf("mem full\n");
16         exit(0);
17     }
18     return x;
19 }
20 int freenode(NODE x)
21 {
22     free(x);
23     return 0;
24 }
25 NODE insert_front(NODE first,int item)
26 {
27     NODE temp;
28     temp=getnode();
29     temp->info=item;
```



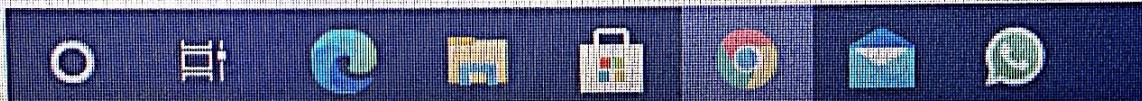
```
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29     temp->info=item;
30     temp->link=NULL;
31     if(first==NULL)
32         return temp;
33     temp->link=first;
34     first=temp;
35     return first;
36 }
37
38 NODE insert_rear(NODE first,int item)
39 {
40     NODE temp,cur;
41     temp=getnode();
42     temp->info=item;
43     temp->link=NULL;
44     if(first==NULL)
45         return temp;
46     cur=first;
47     while(cur->link!=NULL)
48         cur=cur->link;
49     cur->link=temp;
50     return first;
51 }
52
53 void display(NODE first)
54 {
55     NODE temp;
56     if(first==NULL)
57         printf("list empty, cannot display items\n");
```

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```
57  printf("list empty cannot display items\n");
58  for(temp=first,temp!=NULL,temp=temp->link)
59  {
60  printf("%d\n",temp->info);
61  }
62
63  NODE insert_pos( int item, int pos, NODE first)
64  {
65  NODE temp;
66  NODE prev,cur;
67  int count;
68  temp=getnode();
69  temp->info=item;
70  temp->link=NULL;
71  if(first==NULL && pos==1)
72  {
73  return temp;
74  }
75  if(first==NULL)
76  {
77  printf("invalid position\n");
78  return first;
79  }
80  if(pos==1)
81  {
82  temp->link=first;
83  return temp;
84  }
85  count=1;
```

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```
85     count=1;
86     prev=NULL;
87     cur=first;
88     while(cur!=NULL && count!=pos)
89     {
90         prev=cur;
91         cur=cur->link;
92         count++;
93     }
94     if(count==pos)
95     {
96         prev->link=temp;
97         temp->link=cur;
98         return first;
99     }
100    printf("invalid position \n");
101    return first;
102 }
103 int main()
104 {
105     int item,choice,pos;
106     NODE first=NULL;
107     system("cls");
108     for(;;)
109     {
110         printf("\n 1:Insert_front\n 2:Insert at specified position
111             \n 3:Insert_rear\n 4:Display_list\n 5:Exit\n");
112         printf("enter the choice\n");
113         scanf("%d",&choice);
```



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```
111  printf("enter the choice:");  
112  scanf("%d",&choice);  
113  switch(choice)  
114  {  
115      case 1:printf("enter the item at front-end\n");  
116      scanf("%d",&item);  
117      first=insert_front(first,item);  
118      break;  
119      case 2:printf("enter the item to be inserted:\n");  
120          scanf("%d",&item);  
121          printf("enter the position at which item to be  
122              inserted:\n");  
123          scanf("%d",&pos);  
124          first=insert_pos(item,pos,first);  
125          break;  
126      case 3:printf("enter the item at rear-end\n");  
127      scanf("%d",&item);  
128      first=insert_rear(first,item);  
129      break;  
130      case 4:display(first);  
131      break;  
132      default:exit(0);  
133  }  
134 }  
135 return 0;  
136 }
```



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Console

Shell

```
↳ clang-7 -pthread -lm -o main main.c
↳ ./main
sh: 1: cls: not found
```

```
1:Insert_front
2:Insert at specified position
3:Insert_rear
4:Display_list
6:Exit
enter the choice
1
enter the item at front-end
12
```

```
1:Insert_front
2:Insert at specified position
3:Insert_rear
4:Display_list
6:Exit
enter the choice
3
enter the item at rear-end
23
```

```
1:Insert_front
2:Insert at specified position
3:Insert_rear
4:Display_list
6:Exit
enter the choice
2
enter the item to be inserted:
23
```

```
1:Insert_front  
2:Insert at specified position  
3:Insert_rear  
4:Display_list  
6:Exit  
enter the choice  
2  
enter the item to be inserted:  
23  
enter the position at which item to be inserted  
1
```

```
1:Insert_front  
2:Insert at specified position  
3:Insert_rear  
4:Display_list  
6:Exit  
enter the choice  
4  
23  
12  
23
```

```
1:Insert_front  
2:Insert at specified position  
3:Insert_rear  
4:Display_list  
6:Exit  
enter the choice
```