Program 1:

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

typedef struct Node
{
	char name[50];
	int phone_number;
	char address[500];
	char area[50];
	struct Node *next, *prev;
} Node;

typedef struct CustomerDetails
{
	Node *head;
} CustomerDetails;

void init(CustomerDetails *p);
void disp(CustomerDetails *p);
void ordered_insert(CustomerDetails *p,char *name, int p_no,char *address, char *area);
int main()
{
		CustomerDetails l;
		init(&l);
		int choice;
		printf("1: Enter details\n2: Display details\n");
		scanf("%d",&choice);
		char name[50];
		int p_no;
```

```
char address[500];
char area[50];

while(choice)
{
        switch(choice)
        {
                case 1:
                    printf("Enter the Name\n");
                    scanf("%s",name);
                    printf("Enter the Phone Number\n");
                    scanf("%d",  &(p_no));
                    printf("Enter the Address\n");
                    scanf("%s", address);
                    printf("Enter the Area\n");
                    scanf("%s", area);
                        ordered_insert(&l,name, p_no,address,area);
                        break;
                case 2:
                        disp(&l);
                        break;

                default:
                    printf("INVALID CHOICE!!! Retry!!!");
                    //exit(0);
        }
        printf("1: Enter details\n2: Display details\n");
        scanf("%d",&choice);
}

return 0;
```

```
}
void init(CustomerDetails *p)
{
	p->head=NULL;
}

void disp(CustomerDetails *p)
{
	Node *pres=p->head;
	if(p->head==NULL)
	{
		printf("Empty list\n");
	}
	else{
	printf("NAME\tPHONE NUMBER\t\tADDRESS\t\tAREA\n");
	while(pres!=NULL)
	{
		printf("%s \t%d \t%s  \t%s ",pres->name, pres->phone_number,pres->address,pres->area);
		printf("\n");
		pres=pres->next;
	}
	printf("\n");
	}

}
Node* create_node(char *name, int p_no,char *address,char *area)
{
	Node *temp=(Node*)malloc(sizeof(Node));
	strcpy(temp->name, name);
	temp->phone_number=p_no;
```

```
        strcpy(temp->address, address);
        strcpy(temp->area, area);
        temp->next=NULL;
        temp->prev=NULL;
        return temp;
}

void ordered_insert(CustomerDetails *p,char *name, int p_no,char *address, char *area)
{
   Node *temp=create_node(name,p_no,address,area);

   if(p->head==NULL) //when list is empty
      p->head=temp;

   else //list is not empty
   {
      Node *present=p->head;
      Node *previous=NULL;

      while(present!=NULL && strcmp(present->name, name)<0)
      {
         previous=present;
         present=present->next;
      }
      if(previous==NULL) //front insertion
      {
         p->head=temp;
         temp->next=present;
         present->prev = temp;
      }
      else //middle and end insertion
```

```
    {
      temp->next=present;
      present->prev=temp;
      previous->next=temp;
      temp->prev = previous;
    }
  }
}
```

```
C:\Users\unuiw\OneDrive\Desktop\ds>gcc lab3-1.c

C:\Users\unuiw\OneDrive\Desktop\ds>a
1: Enter details
2: Display details
1
Enter the Name
vishal
Enter the Phone Number
987456321
Enter the Address
daw
Enter the Area
dsr
1: Enter details
2: Display details
1
Enter the Name
aman
Enter the Phone Number
985476123
Enter the Address
iadhw
Enter the Area
caj
1: Enter details
2: Display details
2
NAME    PHONE NUMBER            ADDRESS         AREA
aman    985476123       iadhw   caj
vishal  987456321       daw     dsr

1: Enter details
2: Display details
```

Program 2:

```
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
typedef struct Department{
  char name[25];
  int number;
} Dep;
typedef struct Node{
  char ssn[15];
  char name[25];
  Dep department;
  char designations[20];
  int salary;
  int phone_number;
  int age;
  struct Node *next, *prev;
} Node;
typedef struct Employees {
  Node *head;
} Emp;
void init(Emp *li);
void insert(Emp *p,char *name, char *ssn,char *dep,char *des,int age,int sal,int p_n,int code);
void del(Emp *p);
void display(Emp *p,char des[]);
int main()
{
  Emp list;
  init(&list);
  int choice=2;
  while (choice) {
```

```
   printf("Enter SSN, Employee name,Department,designations,department code,salary,phone
number and age\n");
   int s,p,a,c;
   char n[15],m[25],d[20],dp[25];
   scanf("%s",n );
   fflush(stdout);
   scanf("%s",m );
   fflush(stdout);
   scanf("%s",dp);
   fflush(stdout);
   scanf("%s",d);
   fflush(stdout);
   scanf("%d",&c);
   scanf("%d",&s);
   scanf("%d",&p);
   scanf("%d",&a);
   insert(&list,n,m,dp,d,a,s,p,c);
   printf("Enter 0 to exit");
   scanf("%d",&choice);
  }
  del(&list);
  choice=1;
  while (choice) {
   printf("Enter department of which u want details:");
   char dep[20];
   scanf("%s",dep);
   display(&list,dep);
   printf("Enter 0 to exit");
   scanf("%d",&choice);
  }
  return 0;
```

```
}
void init(Emp *li)
{
  li->head=NULL;
}
Node* create_node(char *name, char *ssn,char *dep,char *des,int age,int sal,int p_n,int code)
{
            Node *temp=(Node*)malloc(sizeof(Node));
            strcpy(temp->name, name);
            temp->phone_number=p_n;
            strcpy(temp->ssn, ssn);
            strcpy(temp->designations, des);
  strcpy(temp->department.name, dep);
  temp->salary=sal;
  temp->age=age;
  temp->department.number=code;
            temp->next=NULL;
            temp->prev=NULL;
            return temp;
}
void insert(Emp *p,char *ssn, char *name,char *dep,char *des,int age,int sal,int p_n,int code)
{
    Node *temp=create_node(name,ssn,dep,des,age,sal,p_n,code);
    if(p->head==NULL)
       p->head=temp;
    else
    {
       temp->next=p->head;
       p->head->prev=temp;
       p->head=temp;
    }
```

```
}
void del(Emp *p)
{
  Node *temp=p->head;
  while(temp!=NULL)
  {
    if(temp->age>58)
    {
      if(temp->prev==NULL)
      {
        temp=temp->next;
        p->head=temp;
        free(temp->prev);
        temp->prev=NULL;
      }
      else if(temp->next==NULL)
      {
        temp->prev->next=NULL;
        free(temp);
      }
      else{
        temp->prev->next=temp->next;
        temp->next->prev=temp->prev;
        free(temp);
      }
    }
    temp=temp->next;
  }
}
void display(Emp *p,char des[])
{
```

```
  printf("display\n");
  Node *temp=p->head;
  while(temp!=NULL)
  {
    printf("%s\n",temp->department.name);
    if(strcmp(temp->department.name,des)==0)
    {
      printf("\nSSN:%s\nName:%s\nDesignation:%s\nSalary:%d\nPhone
Number:%d\nage:%d\n\n",temp->ssn,temp->name,temp->designations,temp->salary,temp-
>phone_number,temp->age );
    }
    temp=temp->next;
  }
}
```

```
C:\Users\unuiw\OneDrive\Desktop\ds>gcc lab3-2.c

C:\Users\unuiw\OneDrive\Desktop\ds>a
Enter SSN, Employee name,Department,designations,department code,salary,phone number and age
dawsf
faef
gdseg
dfses
5698
564
489
52
Enter 0 to exit1
Enter SSN, Employee name,Department,designations,department code,salary,phone number and age
feshlfe
fhae'ivm
vsnies'v
vne
9856
485
60
60
Enter 0 to exit1
Enter SSN, Employee name,Department,designations,department code,salary,phone number and age
fawpm
vafek
egoja
ojw
9856
4785
1542
52
Enter 0 to exit0
Enter department of which u want details:vsnies'v
display
egoja
gdseg
Enter 0 to exit1
Enter department of which u want details:gdseg
display
egoja
gdseg

SSN:dawsf
Name:faef
Designation:dfses
Salary:564
Phone Number:489
age:52

Enter 0 to exit1
```