WEEK – 9

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SECTION : G

```
/*
1)Write a program to insert a mobile number(10 digit) along with the name of
customer into a hash table. Add functions to delete based on phone number
Add function to search a particular phone number and display ythe details
accordingly.Handle the collision using seperate chainingad linear probing
techniques
*/
```

PROGRAM -1 :

HASHING

```
#include<stdio.h>

#include<stdlib.h>

#include<string.h>

struct node

{

    char name[20];

    int ph_no;

    struct node *next;

};


struct hash

{

    struct node *head;

    int count;

};
```

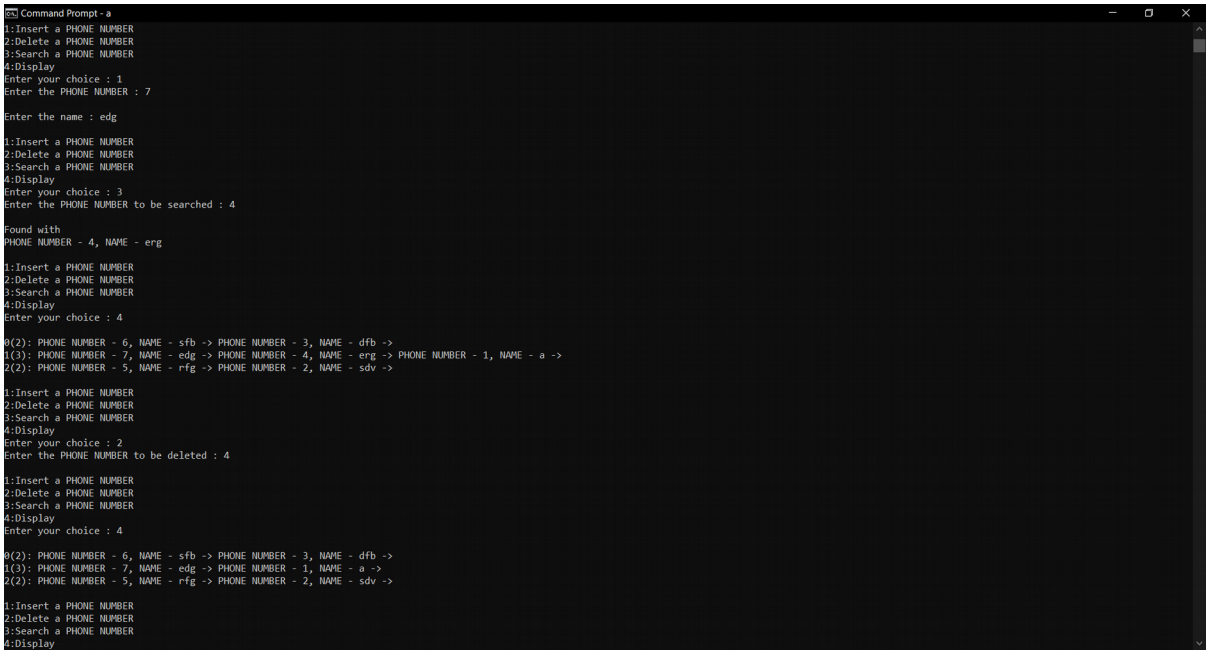
```
void insert(struct hash *ht, int size, int ph_no, char *name);
void delete(struct hash *ht, int size, int ph_no);
void search(struct hash *ht, int sz, int ph);
void display(struct hash *ht, int size);
void main()
{
	int sz, ch, num, i;
	char name[20];
	struct hash *ht;
	printf("Enter the size of table : ");
	scanf("%d", &sz);
	ht=(struct hash *)malloc(sz*(sizeof(struct hash)));
	for(i=0;i<sz;i++)
	{
		ht[i].head=NULL;
		ht[i].count=0;
	}
	while(1)
	{
		printf("\n1:Insert a PHONE NUMBER\n2:Delete a PHONE NUMBER\n3:Search a
PHONE NUMBER\n4:Display\n");
		printf("Enter your choice : ");
		scanf("%d", &ch);
		switch(ch)
		{
			case 1: printf("Enter the PHONE NUMBER : ");
				scanf("%d", &num);
				printf("\nEnter the name : ");
				scanf("%s", name);
				insert(ht, sz, num, name);
```

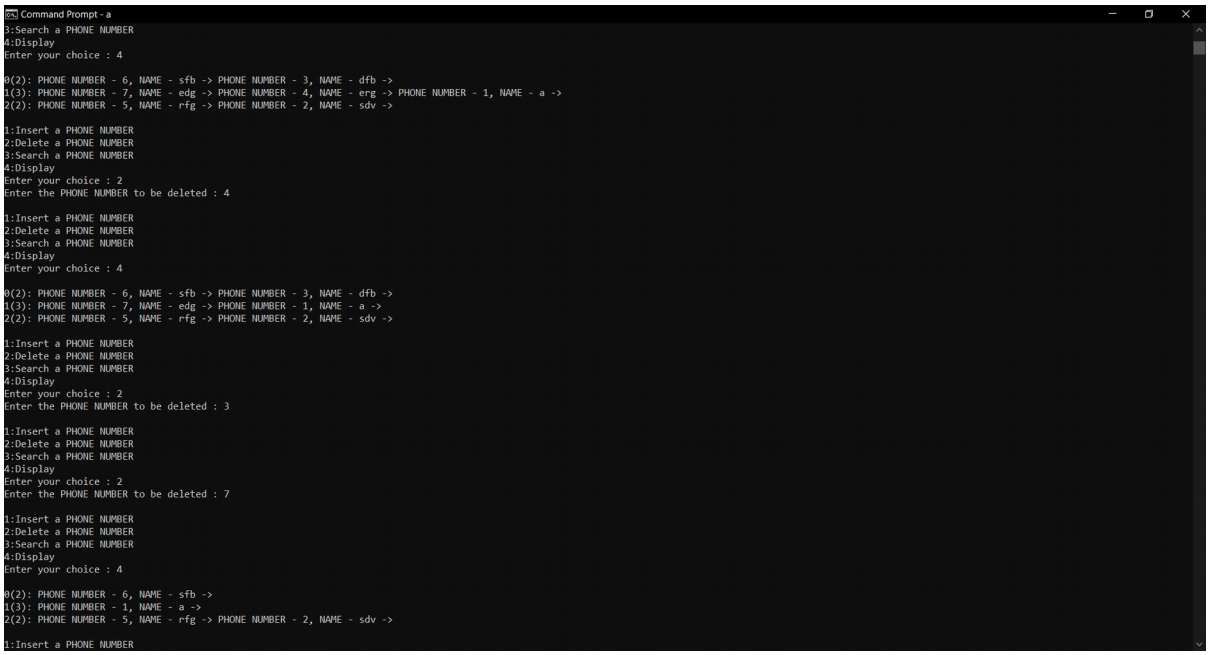
```
                    break;
                case 2: printf("Enter the PHONE NUMBER to be deleted : ");
                    scanf("%d", &num);
                    delete(ht, sz, num);
                    break;
                case 3: printf("Enter the PHONE NUMBER to be searched : ");
                    scanf("%d", &num);
                    search(ht, sz, num);
                    break;
                case 4: display(ht, sz);
                    break;
            }
        }
}

void insert(struct hash *ht, int size, int ph_no, char *name)
{
    int index;
    struct node *temp;
    temp=(struct node *)malloc(sizeof(struct node));
    temp->next=NULL;
    temp->ph_no=ph_no;
    strcpy(temp->name, name);
    index=ph_no%size;
    temp->next=ht[index].head;
    ht[index].head=temp;
    ht[index].count++;
}
```

```
void delete(struct hash *ht, int size, int ph_no)
{
	struct node *prev, *temp;
	int index;
	index=ph_no%size;
	prev=NULL;
	temp=ht[index].head;
	while(temp->ph_no!=ph_no)
	{
		prev=temp;
		temp=temp->next;
	}
	if(temp==NULL)
		printf("Element not found\n");
	else
	{
		if(prev==NULL)
		{
			ht[index].head=temp->next;
		}
		else
		{
			prev->next=temp->next;
		}
	}
}

void display(struct hash *ht, int size)
{
```

```
	int i;
	struct node *temp;
	printf("\n");
	for(i=0;i<size;i++)
	{
		printf("%d(%d): ", i, ht[i].count);
		if(ht[i].head!=NULL)
		{
			temp=ht[i].head;
			while(temp!=NULL)
			{
				printf("PHONE NUMBER - %d, NAME - %s -> ", temp->ph_no, temp->name);
				temp=temp->next;
			}
		}
		printf("\n");
	}
}

void search(struct hash *ht, int sz, int ph)
{
	int index;
	struct node *temp;
	index=ph%sz;
	temp=ht[index].head;
	while((temp!=NULL)&&(temp->ph_no!=ph))
		temp=temp->next;
	if(temp!=NULL)
	{
```

```
        printf("\nFound with\n");
        printf("PHONE NUMBER - %d, NAME - %s\n",temp->ph_no, temp->name);
    }
    else
        printf("Record not found\n");
}
```





PROGRAM-2 :

LINEAR PROBING

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
struct element
{
        int ph_no;
        char name[10];
        int mark;
};

void insert(struct element *ht, int size, int ph_no, char *name, int *count);
int delete(struct element *ht, int size, int ph_no, int *count);
void display(struct element *ht, int size, int *count);
void search(struct element *ht, int size, int ph_no);
int main()
{
        struct element *ht;
```

```
    int ch, sz, i, num, no_elements;
    char name[10];
    printf("Enter the table size : ");
    scanf("%d", &sz);
    ht=(struct element *)malloc(sz*(sizeof(struct element)));
    for(i=0;i<sz;i++)
    {
            ht[i].mark=0;
    }
    no_elements=0;
    while(1)
  {
        printf("\n1:Insert a PHONE NUMBER\n2:Delete a PHONE
NUMBER\n3:Search a PHONE NUMBER\n4:Display\n");
        printf("Enter your choice : ");
        scanf("%d", &ch);
        switch(ch)
        {
             case 1: printf("Enter the PHONE NUMBER : ");
                  scanf("%d", &num);
                  printf("\nEnter the name : ");
                  scanf("%s", name);
                  insert(ht, sz, num, name, &no_elements);
                  break;
             case 2: printf("Enter the PHONE NUMBER to be deleted : ");
                  scanf("%d", &num);
                  delete(ht, sz, num, &no_elements);
```

```
                    break;
                case 3: printf("Enter the PHONE NUMBER to be searched : ");
                    scanf("%d", &num);
                    search(ht, sz, num);
                    break;
                case 4: display(ht, sz, &no_elements);
                    break;
            }
        }
}

void insert(struct element *ht, int size, int ph_no, char *name, int *count)
{
        int index;
        if(*count==size)
        {
                printf("Table is full\n");
        }
        index=ph_no%size;
        while(ht[index].mark==1)
        {
                index=(index+1)%size;
        }
        ht[index].ph_no=ph_no;
        strcpy(ht[index].name, name);
        ht[index].mark=1;
```

```
        (*count)++;
}

int delete(struct element *ht, int size, int ph_no, int *count)
{
        int index, i=0;
        if(*count==0)
                printf("Table is empty\n");
        index=ph_no%size;
        while(ht[index].ph_no!=ph_no && i<=*count)
        {
                index=(index+1)%size;
                i++;
        }
        if(ht[index].ph_no==ph_no)
        {
                ht[index].mark=0;
                (*count)--;
        }
        else
        {
                printf("Not found in the table\n");
        }
}

void display(struct element *ht, int size, int *count)
```

```
{
        int i, index;
        for(i=0;i<size;i++)
        {
                printf("\n%d : ", i);
                if(ht[i].mark!=0)
                        printf("PHONE NUMBER - %d, NAME - %s, MARK - %d -> ",
ht[i].ph_no, ht[i].name, ht[i].mark);
        }
        printf("\nNumber of elements : %d", *count);
}

void search(struct element *ht, int size, int ph_no)
{
      int index;
      index=ph_no%size;
      while(ht[index].ph_no!=ph_no)
            index=(index+1)%size;
      if(ht[index].ph_no==ph_no)
      {
            printf("\nFound with\n");
            printf("PHONE NUMBER - %d, NAME - %s\n", ht[index].ph_no,
ht[index].name);
      }
      else
            printf("Record not found\n");
}
```


Command Prompt - a
1:Insert a PHONE NUMBER
2:Delete a PHONE NUMBER
3:Search a PHONE NUMBER
4:Display
Enter your choice : 4
0 : PHONE NUMBER - 4, NAME - wrg, MARK - 1 ->
1 : PHONE NUMBER - 5, NAME - wrg, MARK - 1 ->
2 : PHONE NUMBER - 2, NAME - werg, MARK - 1 ->
3 : PHONE NUMBER - 3, NAME - gb, MARK - 1 ->
4 : PHONE NUMBER - 8, NAME - wrg, MARK - 1 ->
Number of elements : 5
1:Insert a PHONE NUMBER
2:Delete a PHONE NUMBER
3:Search a PHONE NUMBER
4:Display
Enter your choice : 2
Enter the PHONE NUMBER to be deleted : 5
1:Insert a PHONE NUMBER
2:Delete a PHONE NUMBER
3:Search a PHONE NUMBER
4:Display
Enter your choice : 4
0 : PHONE NUMBER - 4, NAME - wrg, MARK - 1 ->
1 :
2 : PHONE NUMBER - 2, NAME - werg, MARK - 1 ->
3 : PHONE NUMBER - 3, NAME - gb, MARK - 1 ->
4 : PHONE NUMBER - 8, NAME - wrg, MARK - 1 ->
Number of elements : 4
1:Insert a PHONE NUMBER
2:Delete a PHONE NUMBER
3:Search a PHONE NUMBER
4:Display
Enter your choice : 3
Enter the PHONE NUMBER to be searched : 3
Found with
PHONE NUMBER - 3, NAME - gb
1:Insert a PHONE NUMBER
2:Delete a PHONE NUMBER
3:Search a PHONE NUMBER
4:Display
Enter your choice :