**12. Given a File of N employee records with a set K of Keys(4-digit) which uniquely determine the records in file F. Assume that file F is maintained in memory by a Hash Table(HT) of m memory locations with L as the set of memory addresses (2-digit) of locations in HT. Let the keys in K and addresses in L are Integers. Design and develop a Program in C that uses Hash function H: K → L as H(K)=K mod m (remainder method), and implement hashing technique to map a given key K to the address space L. Resolve the collision (if any) using linear probing.**

#include <stdio.h>

#include <stdlib.h>

#define MAX 100

int create(int);

void linear\_prob(int[], int, int);

void display (int[]);

void main()

{

int a[MAX],num,key,i;

int ans=1;

printf(" collision handling by linear probing : \n");

for (i=0;i<MAX;i++)

{

a[i] = -1;

}

do

{

printf("\n Enter the data");

scanf("%4d", &num);

key=create(num);

linear\_prob(a,key,num);

printf("\n Do you wish to continue ? (1/0) ");

scanf("%d",&ans);

}while(ans);

display(a);

}

int create(int num)

{

int key;

key=num%100;

return key;

}

void linear\_prob(int a[MAX], int key, int num)

{

int flag, i, count=0;

flag=0;

if(a[key]== -1)

{

a[key] = num;

}

else

{

printf("\nCollision Detected...!!!\n");

i=0;

while(i<MAX)

{

if (a[i]!=-1)

count++;

i++;

}

printf("Collision avoided successfully using LINEAR PROBING\n");

if(count == MAX)

{

printf("\n Hash table is full");

display(a);

exit(1);

}

for(i=key+1; i<MAX; i++)

if(a[i] == -1)

{

a[i] = num;

flag =1;

break;

}

//for(i=0;i<key;i++)

i=0;

while((i<key) && (flag==0))

{

if(a[i] == -1)

{

a[i] = num;

flag=1;

break;

}

i++;

}

}

}

void display(int a[MAX])

{

int i,choice;

printf("1.Display ALL\n 2.Filtered Display\n");

scanf("%d",&choice);

if(choice==1)

{

printf("\n the hash table is\n");

for(i=0; i<MAX; i++)

printf("\n %d %d ", i, a[i]);

}

else

{

printf("\n the hash table is\n");

for(i=0; i<MAX; i++)

if(a[i]!=-1)

{

printf("\n %d %d ", i, a[i]);

continue;

}

}

}

**Output:**

root:~/dslab #gedit hash.c

root:~/dslab #cc hash.c

root:~/dslab # ./a.out

collision handling by linear probing :

Enter the data

1234

Do you wish to continue ? (1/0) 1

Enter the data

2548

Do you wish to continue ? (1/0) 1

Enter the data

3256

Do you wish to continue ? (1/0) 1

Enter the data

1299

Do you wish to continue ? (1/0) 1

Enter the data

1298

Do you wish to continue ? (1/0) 1

Enter the data

1398

Collision Detected...!!!

Collision avoided successfully using LINEAR PROBING

Do you wish to continue ? (1/0) 0

1.Display ALL

2.Filtered Display

2

The hash table is

0 1398

34 1234

48 2548

56 3256

98 1298

99 1299