# WEEK 1

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Q) Write a C program to search using linear probing method.

**Input:**

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

int len;

int hasht(int key);
int rehashl(int key);
int rehashq(int key, int j);

int main()
{
   int key,arr[20],hash[20], i, n, s, op, j, k, count=0 ;
   printf ("Enter the size of the hash table:  ");
   scanf ("%d",&len);
```

```
printf ("\nEnter the number of elements: ");
scanf ("%d",&n);
if(n>len){
   printf("Invalid!!\n");
   exit(0);
}
else
{
   for (i=0;i<len;i++)
      hash[i]=-1 ;
   printf ("Enter Positive Elements: ");
   for (i=0;i<n;i++)
      scanf("%d",&arr[i]);
   while(1)
   {
      printf("\n\n1.Linear Probing\n2.Quadratic
Probing \n3.Exit \nEnter your option: ");
      scanf("%d",&op);
      switch(op)
      {
```

```
            case 1:
               for (i=0;i<len;i++)
                  hash[i]=-1 ;
               for(k=0;k<n;k++)
               {
                  key=arr[k] ;
                  i = hasht(key);
                  while (hash[i]!=-1)
                  {
                     i = rehashl(i);
                  }
                  hash[i]=key ;
               }
               printf("\nThe elements in the array are (-1
represents No element): ");
               for (i=0;i<len;i++)
                  printf("\n  Element at position %d:
%d",i,hash[i]);
               break ;
            case 2:
               for (i=0;i<len;i++)
```

```
            hash[i]=-1 ;
        for(k=0;k<n;k++)
        {
            j=0;
            key=arr[k] ;
            i = hasht(key);
            while (hash[i]!=-1)
            {
                i = rehashq(i,j);
                j++ ;
            }
            hash[i]=key;
        }
        printf("\nThe elements in the array are (-1
represents No element): ");
        for (i=0;i<len;i++)
            printf("\n Element at position %d:
%d",i+1,hash[i]);
        break ;
    case 3: exit(0); break;
    default: printf("\nInvalid!"); break;
```

```
            }
        }
    }
    return 0;
}

int hasht(int key)
{
    int i ;
    i = (key-1)%len ;
    return i;
}

int rehashl(int key)
{
    int i ;
    i = (key+1)%len ;
    return i ;
}
```

```
int rehashq(int key, int j)
{
   int i ;
   i = (key+(j*j))%len ;
   return i ;
}
```

**OUTPUT:**

```
PS C:\Users\Admin> cd "c:\Users\Admin\Documents\" ; if ($?) {
Enter the size of the hash table:  5

Enter the number of elements: 4
Enter Positive Elements: 1
2
3
4


1.Linear Probing
2.Quadratic Probing
3.Exit
Enter your option: 1

The elements in the array are (-1 represents No element):
  Element at position 0: 1
  Element at position 1: 2
  Element at position 2: 3
  Element at position 3: 4
  Element at position 4: -1

1.Linear Probing
2.Quadratic Probing
3.Exit
Enter your option: 2

The elements in the array are (-1 represents No element):
 Element at position 1: 1
 Element at position 2: 2
 Element at position 3: 3
 Element at position 4: 4
 Element at position 5: -1

1.Linear Probing
2.Quadratic Probing
3.Exit
Enter your option: 3
PS C:\Users\Admin\Documents>
```