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DSA ASSIGNMENT

Question -

Write a program to perform Insert, Delete, and Search operations on a Hash table using division method. Based on the user choice, 1. Linear Probing, 2.Quadratic Probing, resolve the collisions.

Code-

```
import java.util.Scanner;

public class HASHTABLE_LINEAR_QUARDRATIC_PROBING_USER_CHOICE

{


    public static int[] insert(int arr[],int num)

    {

       int d=num%10;

       if(arr[d]==-1)

       {

          arr[d]=num;

       }

       else

       {   int f=d;

          while(arr[d]!=-1)

          {


             if(d==9)

             {

                d=-1;

             }

             ++d;

          }



             arr[d]=num;
```

```
    }
    return arr;
}
public static void printarr(int arr[])
{
    for(int j=0;j<10;j++)
                {
                    if(arr[j]!=-1)
                    {
                        System.out.print(arr[j]+"  ");
                    }
                }
                System.out.println();
}
public static int linear_search(int arr[],int num)
{
    int d=num%10;
    if(arr[d]==num)
    {
        return d;
    }
    else
    {  int f=d;
        while(arr[d]!=num)
        {
            if(d==9)
            {
                d=-1;
            }
            ++d;
```

```
        }
        return d;

    }
}
public static int quadsearch(int table[],int num)
{
    int hv =num % 10;
       if (table[hv] == -1)
          table[hv] = num;
       else
       {
          int t=0;
          for (int j = 0; j < 10; j++)
          {

              t = (hv + j * j) % 10;
             if (table[t] == num)
             {
                break;
             }
          }
           hv=t;
       }
       return hv;
}
static void hashing(int table[],int num)
{

       int hv =num % 10;
       if (table[hv] == -1)
```

```
            table[hv] = num;
        else
        {
            for (int j = 0; j < 10; j++)
            {

                int t = (hv + j * j) % 10;
                if (table[t] == -1)
                {
                    table[t] = num;
                    break;
                }
            }

        }

    printarr(table);
}

        public static void main(String[] args) {
                    Scanner sc=new Scanner(System.in);
            int arr[]=new int[100];
            for(int i=0;i<10;i++)
            {
                arr[i]=-1;
            }
            System.out.println("0. LINEAR PROBBING ");
            System.out.println("1. QUADRATIC PROBBING ");
            int k=sc.nextInt();
            if(k==0)
            {
```

```
int f=1;
while(f==1)
{   System.out.println("1.insert");
   System.out.println("2.search");
   System.out.println("3.delete");
   System.out.println("0.exit");
   System.out.print("your choice:");
   int ch=sc.nextInt();
   switch(ch)
   {

      case 0:f=0;break;
     case 1: System.out.print("insert number : ");
        int num=sc.nextInt();
        arr=insert(arr,num);
        printarr(arr);
        break;
      case 3:System.out.print(" delete number  :");
         int n1=sc.nextInt();
         int c=linear_search(arr,n1);
         arr[c]=-1;
         printarr(arr);
         break;
      case 2: System.out.print(" searchenumber  : ");
        int num1=sc.nextInt();
         num1=linear_search(arr,num1);
         System.out.println("number is found at "+num1);
         break;

   }
}
```

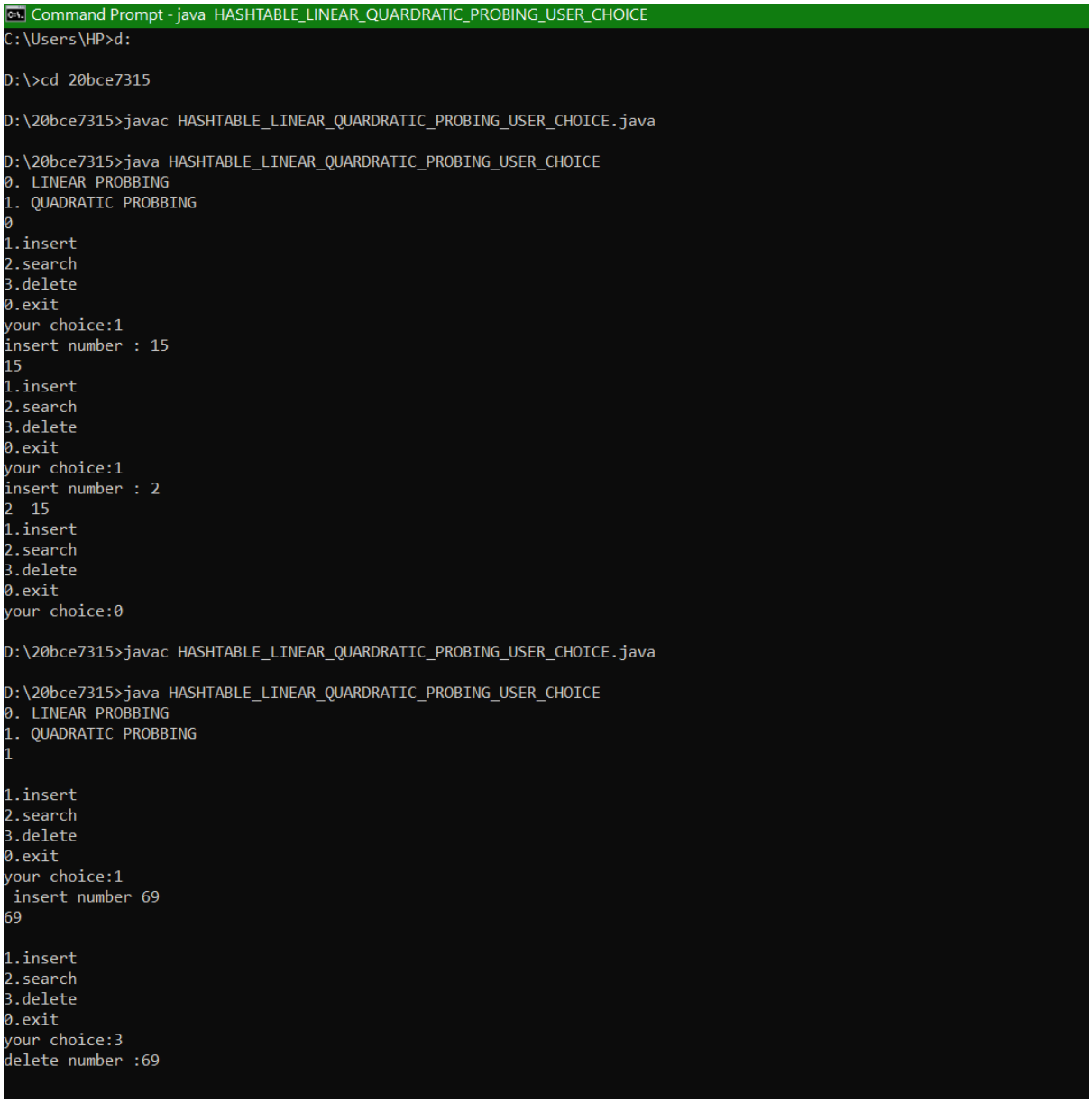
```
  }
  else
  {

     int f1=1;
    while(f1==1)
    {   System.out.println("");
     System.out.println("1.insert");
      System.out.println("2.search");
      System.out.println("3.delete");
      System.out.println("0.exit");
      System.out.print("your choice:");
      int ch1=sc.nextInt();
      switch(ch1)
      {
         case 0: f1=0;break;
         case 1:System.out.print(" insert number ");
               int n2=sc.nextInt();
               hashing(arr,n2);break;
         case 2:System.out.print("search number  :");
       int s2=sc.nextInt();
       int c2=quadsearch(arr,s2);
       System.out.println("number is found at "+c2);break;
          case 3: System.out.print("delete number :");
         int d3=sc.nextInt();
         int c3=quadsearch(arr,d3);
         arr[c3]=-1;
         printarr(arr);break;
      }
  }
}
```

}

}

Output-


Command Prompt - java HASHTABLE_LINEAR_QUARDRATIC_PROBING_USER_CHOICE
C:\Users\HP>d:
D:\>cd 20bce7315
D:\20bce7315>javac HASHTABLE_LINEAR_QUARDRATIC_PROBING_USER_CHOICE.java
D:\20bce7315>java HASHTABLE_LINEAR_QUARDRATIC_PROBING_USER_CHOICE
0. LINEAR PROBBING
1. QUADRATIC PROBBING
0
1.insert
2.search
3.delete
0.exit
your choice:1
insert number : 15
15
1.insert
2.search
3.delete
0.exit
your choice:1
insert number : 2
2 15
1.insert
2.search
3.delete
0.exit
your choice:0
D:\20bce7315>javac HASHTABLE_LINEAR_QUARDRATIC_PROBING_USER_CHOICE.java
D:\20bce7315>java HASHTABLE_LINEAR_QUARDRATIC_PROBING_USER_CHOICE
0. LINEAR PROBBING
1. QUADRATIC PROBBING
1
1.insert
2.search
3.delete
0.exit
your choice:1
insert number 69
69
1.insert
2.search
3.delete
0.exit
your choice:3
delete number :69