Program No:	20
Roll No :	1525
Title of Program :	Hashtable
Objective :	1 modulo division and lineray probe 2.digit extraction

SOURCE CODE:

```java
import java.util.*;
public class Hashtable
{
    private Integer[ ] table;
    private int size;
    private int capacity;

    public Hashtable (int capacity)
    {
      this.capacity = capacity;
      this.size = 0;
      this.table = new Integer[capacity];

    }

    private int hash (int key)
    {
      return  key%capacity;

    }
    //insert key into hash table
    public void insert(int key)
    {
      if(size == capacity)
      {
        System.out.println("Hash table is full!!  Cannot insert "+  key);
        return ;

    }
      int index=hash(key);
      while(table[index]!=null)
      {
        //linear probe
        index = (index+1)%capacity;

    }
      table [ index] = key;
```

```java
            size++;
        }

        //display

    public void display()
    {
        for(int i=0; i<capacity ; i++)
        {
            if(table[i]!=null)
            {
                System.out.println("Index "+ i+ ": "+ table[i]);
            }
            else
            {
                System.out.println("Index "+i+": null");
            }

        }
    }

    public static void main(String[] args)
    {
        Hashtable h = new Hashtable(10);

        //simple keys to insert
        int[] keys = {10,20,30,40,50,60,70,80,90,100,110};

        for(int i:keys)
        {
            h.insert(i);
        }

        h.display();

    }
}
```

OUTPUT:

```
PS C:\Users\mcamock\DSAlab\new\operator> java  Hashtable
Hash table is full!!  Cannot insert 110
Index 0: 10
Index 1: 20
Index 2: 30
Index 3: 40
Index 4: 50
Index 5: 60
Index 6: 70
Index 7: 80
Index 8: 90
Index 9: 100
PS C:\Users\mcamock\DSAlab\new\operator>
```

```
        int[] keys = {10,50,3,6,70,110};      //AFTER
```

```
PS C:\Users\mcamock\DSAlab\new\operator> javac .\Hashtable.java
PS C:\Users\mcamock\DSAlab\new\operator> java  Hashtable
Index 0: 10
Index 1: 50
Index 2: 70
Index 3: 3
Index 4: 110
Index 5: null
Index 6: 6
Index 7: null
Index 8: null
Index 9: null
PS C:\Users\mcamock\DSAlab\new\operator>
```