Week 3:

A) **Aim**: Write Java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read, display it only if it's not a duplicate of any number already read display the complete set of unique values input after the user enters each new value

Description :

The main two conditions of these programs are

- A number once read should not be read again.
- The number we read should be in the range of 10 and 100.

Procedure:

- If the number lies between 10 and 100, Compare the recently read number with all the previously read numbers,
- if any number matches then declare that it a duplicate and ask the user to enter another number.
- Else declare that the number is not in the range of 10 and 100 and read another number.

Program:

```
import java.io.*;
import java.util.*;

public class Arrays2
{
        public static void main(String ar[])
        {
                int temp,i,flag=0;
                int a[]=new int[10];
                Scanner s=new Scanner(System.in);
                System.out.println("Enter values :  ");
                for( i=0;i<5;)
                {
                        temp=s.nextInt();
                        flag=0;
                        if(temp>10 && temp<100)
                        {
                                for(int j=0;j<i;j++)
                                        if(a[j]==temp)
                                                flag=1;
```

```
                        if(flag==0)
                            {
                                a[i]=temp;
                                i++;
                            }
                            else
                            System.out.println("Number already entered. Enter another value : ");
                    }
                    else
                    System.out.println("Number not in range. Enter another values : ");
                }

                System.out.println("Numbers in the array are : ");
                for(int j=0;j<5;j++)
                    System.out.println(a[j]);
        }
}
```

Output:

```
        D:\ACEM>java  Arrays2
Enter values :
56
89
43
43
Number already entered. Enter another value :
95
76
Numbers in the array are :
56
89
43
95
76
```

b) Aim: Write a Java Program to create an abstract class named Shape that contains two integers and an empty method named print Area(). Provide three classes named Rectangle, Triangle and Circle suchthat each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.

Description:

A class which is declared with the abstract keyword is known as an abstract class in Java.

It can have abstract and non-abstract methods (method with the body).

Procedure:

- Define a class with name Shape declare two integers and assign values
- Define three more classes like Rectangle, Triangle and Circle suchthat each one of the classes extends the Shape class
- Override print_area() method and calculate area
- Write one more class create objects for three classes and call with that object names

Program:

```
abstract class Shape
{
        int a=3,b=4;
         abstract public void print_area();
}
class Rectangle extends Shape
{
         public double area_rect;
         public void print_area()
         {
                area_rect=a*b;
                        System.out.println("The area of rectangle is:"+area_rect);
          }
}
class Triangle extends Shape
{
        double area_tri;
        public void print_area()
        {
                area_tri= 0.5*a*b;
                        System.out.println("The area of  triangle is:"+area_tri);
          }
}
```

```
class Circle     extends   Shape
{
        double  area_circle;

         public void print_area()
        {
                area_circle=3.14*a*a;
                        System.out.println("The area of  circle is:"+area_circle);
        }
}
public class AreaCode
{

        public static void main(String[] args)
        {

                Rectangle r=new Rectangle();
                r.print_area();

                Triangle t=new Triangle();
                t.print_area();

                Circle r1=new Circle();
                 r1.print_area();

          }

}
```

Output:

```
D:\ACEM>javac AreaCode.java
D:\ACEM>java AreaCode
The area of rectangle is:12.0
The area of  triangle is:6.0
The area of  circle is:28.259999999999998
```

C) Aim:

Write a Java program to read the time intervals (HH:MM) and to compare system time if the system Time between your time intervals print correct time and exit else try again to repute the same thing. By using StringToknizer class.

Description:

- Initially take the input interval of time in hours, minutes, and seconds.
- The system time can be read as using the object of the class GregorianCalendar.
- This GregorianCalendar class contains a method by name get which returns a required value from the hour, minutes, and seconds of the system time.
- Calendar class contains variables hour, minute, second which gives the system time through the object of the class GregorianCalendar

Program:

```
import java.util.*;
import java.text.*;

class Tokenizer
{
                    static int[] cal(String y)
                   {
                        String a,b,x=":";
                        int i[] = {0,0};

                StringTokenizer st=new StringTokenizer(y,x);
                a=(String) st.nextElement();
                b=(String) st.nextElement();

                i[0]=Integer.parseInt(a);
                i[1]=Integer.parseInt(b);
                        return i;
                }
}
public class GetCurrentDateTime
{
        public static void main(String[] args)
        {
                SimpleDateFormat dateFormat = new SimpleDateFormat("HH:mm");
                Calendar cal = Calendar.getInstance();
                String y =dateFormat.format(cal.getTime());
```

```
while(true)
{
        String x,t1,a,b;
        int minute,hour;
        int HH[]={0,0},MM[]={0,0};
        t1=dateFormat.format(cal.getTime());
        int time1[]=Tokenizer.cal(t1);
        hour=time1[0];
        minute=time1[1];
        System.out.println("Enter the time intervels in HH:MM fommat");
        Scanner z = new Scanner(System.in);
        String t2=z.next();
        String t3=z.next();

        int time2[]=Tokenizer.cal(t2);
        HH[0]=time2[0];
        MM[0]=time2[1];

        int time3[]=Tokenizer.cal(t3);
        HH[1]=time3[0];
        MM[1]=time3[1];

        if(HH[0]>HH[1])
        {
                int t=HH[0];
                HH[0]=HH[1];
                HH[1]=t;
        }
        if(HH[0]==HH[1] && MM[0]>MM[1])
        {
                int t=MM[0];
                MM[0]=MM[1];
                MM[1]=t;
        }
```

```
if((hour>=HH[0]  &&  hour<HH[1]) || (hour==HH[0] &&  hour==HH[1])  && (minute>=MM[0] &&
minute<=MM[1]))
        {
                        System.out.println("Current time is  "+hour+" : "+minute);
                        break;
                }
                else
                {
                        System.out.println("Try again");
                }
        }
        }
}
```

Output:

```
D:\ACEM>java GetCurrentDateTime

Enter the time intervels in HH:MM fommat

2:15

3:46

Try again

Enter the time intervels in HH:MM fommat

3:46

7:13

Current time is  6 : 23
```