Enumeration

- Enumeration cursor used to retrieve collection object one by one
- Enumeration cursor can get by element method
- Enumeration e=v.elements();
- Methods
- hasMorElements()
- nextElements()
- Retrive elements only in forward direction
- Can used only by read operation.

```java
import java.util.*;
public class VectorExample1 {
    public static void main(String args[]) {
        //Create an empty vector with initial capacity 4
        Vector<String> vec = new Vector<String>(4);
        //Adding elements to a vector
        vec.add("Tiger");
        vec.add("Lion");
        vec.add("Dog");
        vec.add("Elephant");
        //Check size and capacity
        System.out.println("Size is: "+vec.size());
        System.out.println("Default capacity is: "+vec.capacity());
        //Display Vector elements
```

```java
System.out.println("Vector element is: "+vec);
        vec.addElement("Rat");
        vec.addElement("Cat");
        vec.addElement("Deer");
        //Again check size and capacity after two insertions
        System.out.println("Size after addition: "+vec.size());
        System.out.println("Capacity after addition is: "+vec.capacity());
        //Display Vector elements again
        System.out.println("Elements are: "+vec);
        //Checking if Tiger is present or not in this vector
```

```java
if(vec.contains("Tiger"))
    {
        System.out.println("Tiger is present at the index " +vec.indexOf("Tiger"));
    }
    else
    {
        System.out.println("Tiger is not present in the list.");
    }
    //Get the first element
    System.out.println("The first animal of the vector is = "+vec.firstElement());
    //Get the last element
    System.out.println("The last animal of the vector is = "+vec.lastElement());
    }
}
```

Display pattern

0

1 2

3 4 5

6 7 8 9

```java
import java.util.*;
public class Pattern
{
public static void main(String[] args)
{
int[][] p = new int[4][];
for(int i=0;i<4;i++)
p[i] = new int[i+1];
//initializing array
int count=0;
for(int i=0; i < p.length; i++)
{
for(int j=0; j < p[i].length; j++)
{
p[i][j] = count++;
```

```java
        }
    }
    //printing Pattern Using Jagged Array
    for(int i=0; i < p.length; i++)
    {
        for(int j=0; j < p[i].length; j++)
        {
            System.out.print(p[i][j]+" ");
        }
        System.out.println();
    }
}
}
```