

Basic Fundamental Programming

Day 5: Sep 2021

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Array:

- an indexed collection of similar data types.
- homogeneous elements
- fixed size / static data declaration
 - e.g: a1[5]: static --->index=(0-4), length=5
 - | | a1[]: dynamic
- array is an object.

Single dimensional Array:

a1[];

Multidimensional Array:

a1[][],a[][][], ...

Syntax:



Syntax:

Method 1:

1.Array declaration

<data type> <array name> [];

e.g: int a1[];

2.creation of an array

<array name> = new <data type> [size];

e.g: a1 = new int[5];

or

Method 2:

<data type> <array name> [] = new <data type> [size]; Jagged Array

e.g: int a1[] = new int[5];

int a1[][] = new int[][][3];

e.g.:

int a1[];

int []a1;

int a1[], b, c;

int a1[], b[], c[];

int [] a,b,c;

1	2	3
4	5	6
7	8	9

or

1	2	3			
1	2	3	4	5	6
1	2				
1	2	3	4		



Array:

- an indexed collection of similar data types.
- homogeneous elements
- fixed size / static data declaration
 - e.g: `a1[5]`: static ---> index=(0-4), length=5
 - `a1[]`: dynamic
- array is an object.

1D Array



Single dimensional Array:

`a1[];`

C1

C2

C3

Multidimensional Array:

`a1[][], a[][][], ...`

Syntax:

Method 1:

1. Array declaration

`<data type> <array name> [];`

e.g: `int a1[];`

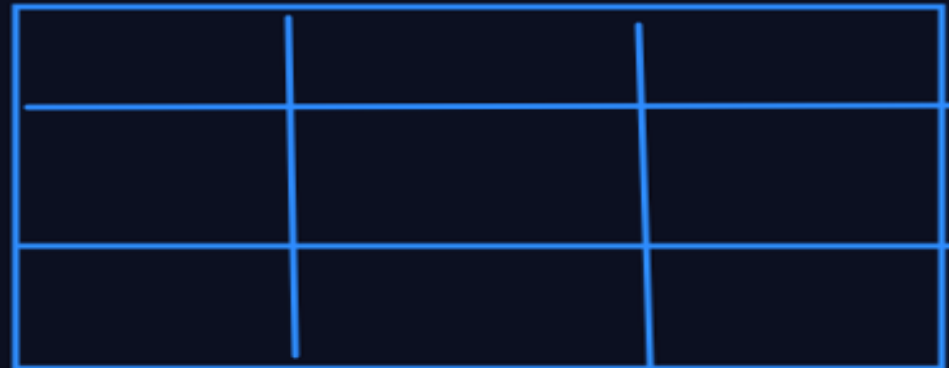
2. creation of an array

R1

R2

R3

2D
Array



`a1[3][3]`

Row, Col

Array:

- an indexed collection of similar data types.
- homogeneous elements
- fixed size / static data declaration
 - e.g: `a1[5]: static ---> index=(0-4), length=5`
 - `a1[]: dynamic`
- array is an object.

Single dimensional Array:

`a1[];`

Multidimensional Array:

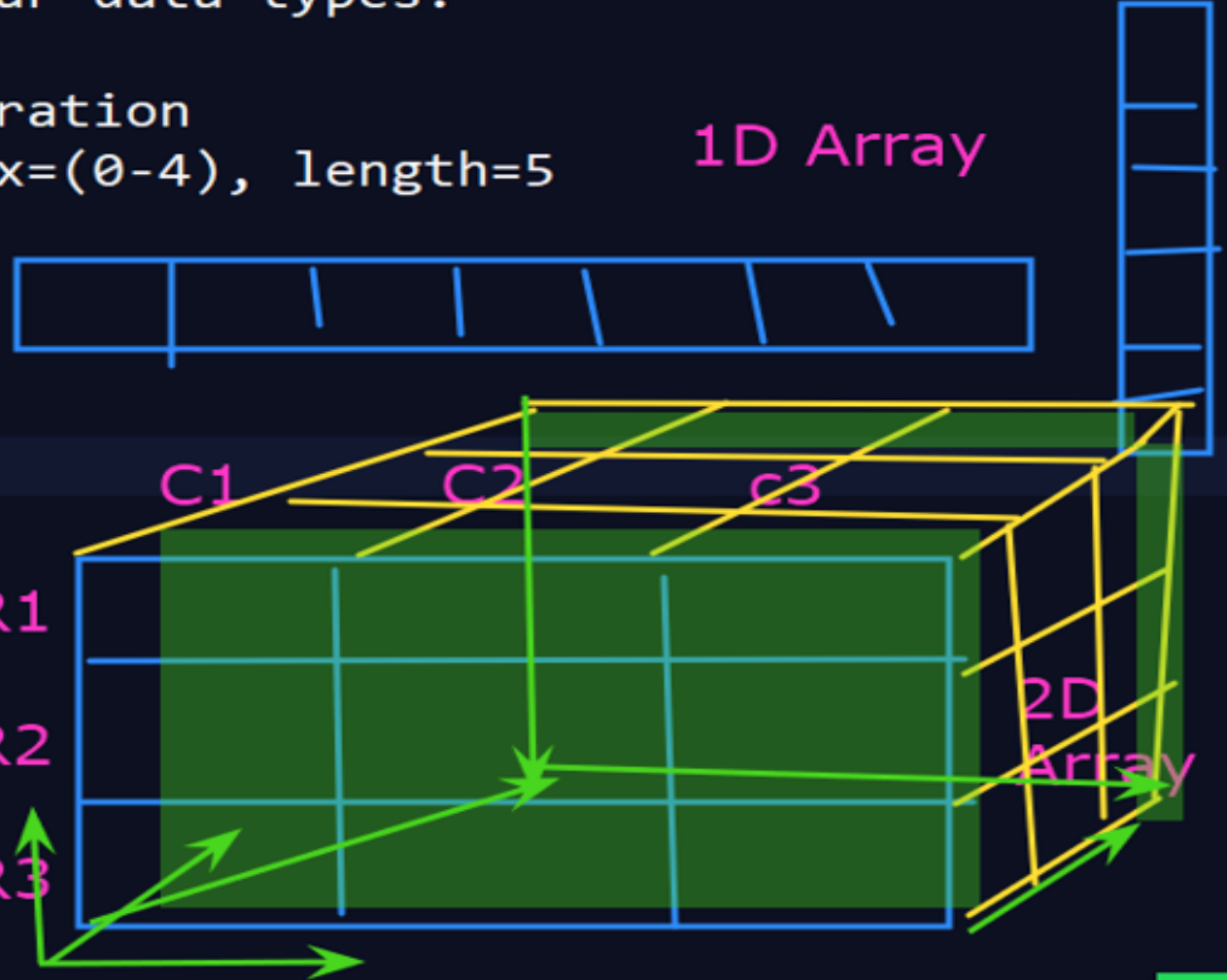
`a1[][], a[][][], ...`

Syntax:

Method 1:

1. Array declaration

`<data type> <array name> [];`
e.g: `int a1[];`



Method 1:

1.Array declaration

<data type> <array name> [];

e.g: int a1[];

2.creation of an array

<array name> = new <data type> [size];

e.g: a1 = new int[5];

or

Method 2:

<data type> <array name> [] = new <data type> [size];

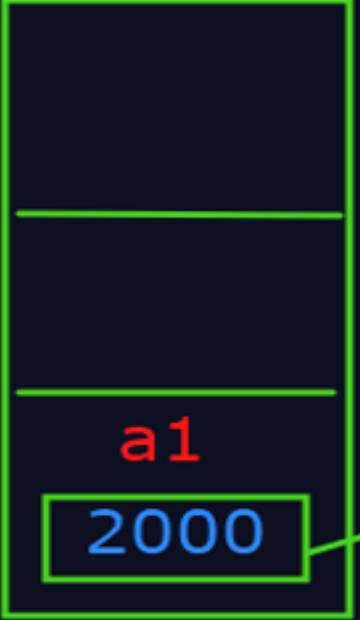
e.g: int a1[] = new int[5];

int a1[][] = new int[][3];

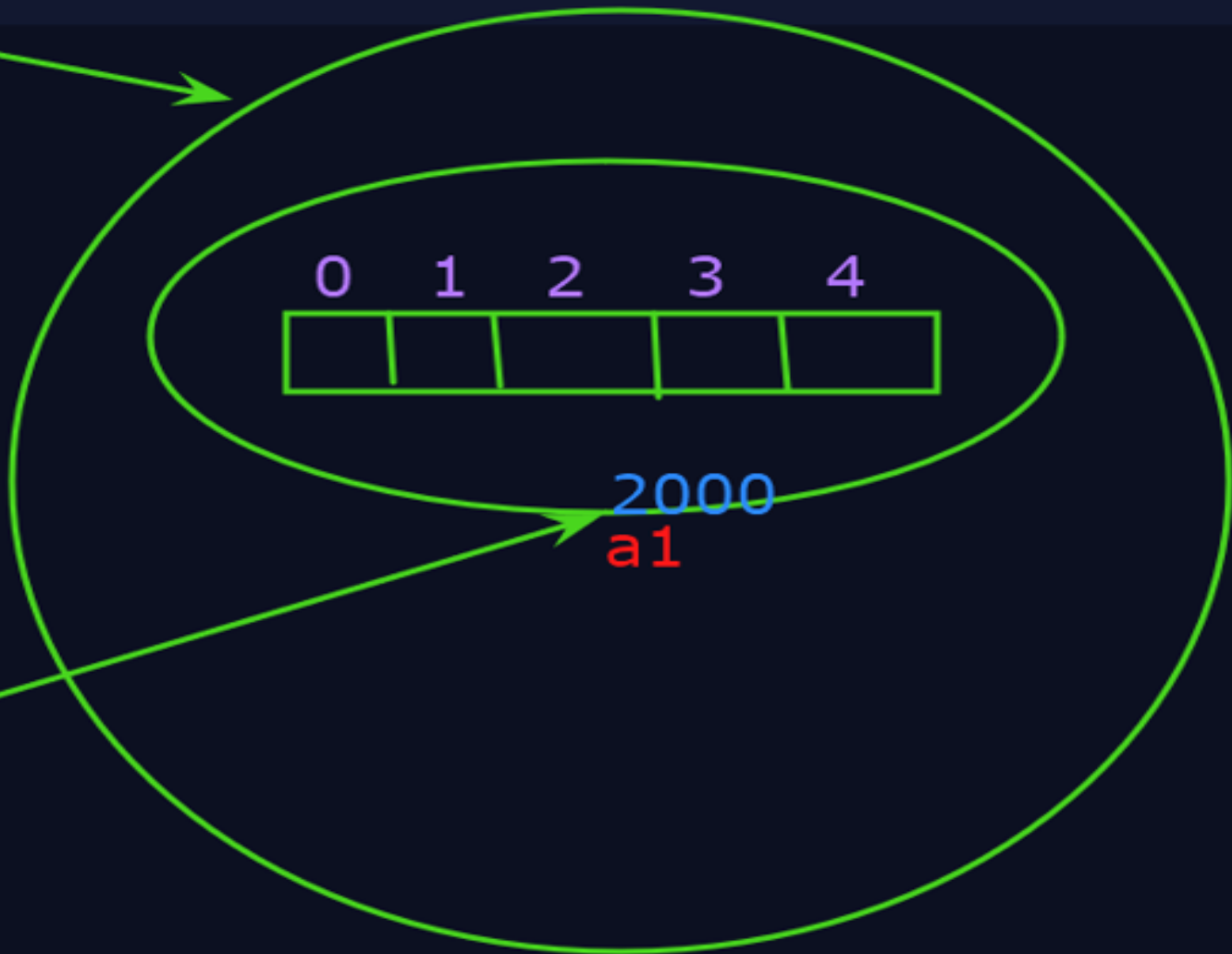
```
or  
int a1[] = new int[5];
```

int a1[]

1000



stack



2000
a1

Heap


```
int a1[] = new int[5];
```

```
//User Input
```

```
for(int i=0;i<a1.length;i++)  
{  
    a1[i]=s1.nextInt();  
}
```

```
System.out.println("-----");
```

```
//For each
```

```
for(int x:a1)
```

```
{  
    System.out.println(x);  
}
```

```
System.out.println(x); //11 22 33 44 55
```




```
import java.util.Scanner;

class P31{
    public static void main(String args[])
    {
        Scanner s1 = new Scanner(System.in);
        int a1[] = new int[5];

        //User Input 1 2 3
        for(int i=0; i<3; i++) //0, 1 2
        {
            a1[i]=s1.nextInt();
        }
        System.out.println("-----");

        //For each
        for(int x:a1)
        {
            System.out.println(x); //11 22
        }
    }
}
```

```
import java.util.Scanner;
```

```
class P32{
```

```
    public static void main(String args[])  
    {
```

```
        Scanner s1 = new Scanner(System.in);  
        int a1[] = new int[5];
```

```
        //User Input
```

```
        for(int i=0;i<2;i++)  
        {
```

```
            a1[i]=s1.nextInt();
```

```
        }
```

```
        System.out.println("-----");
```

$i \leq 5$

```
        for(int i=0;i<=a1.length;i++)    //0,1,2,3,4,5
```

```
        {
```

```
            System.out.println(a1[i]);
```

```
        }
```

```
    }
```

```
}
```

length;
length();

```
import java.util.Scanner;
```

```
class Matrix{
```

```
    public static void main(String args[])
```

```
{
```

```
    Scanner s1 = new Scanner(System.in);
```

```
    int a1[][] = new int[3][3];
```

```
}
```

```
}
```

	c1	c2	c3
R1	1	2	3
R2	4	5	6
R3	7	8	9

Row =i, col=j

i=1, j=1,2,3

i=2, j=1,2,3

i=3, j=1,2,3

```
import java.util.Scanner;
```

```
class Matrix{
```

```
    public static void main(String args[])
```

```
    {
```

```
        Scanner s1 = new Scanner(System.in);
```

```
        int a1[][] = new int[3][3];
```

```
    }
```

	c1	c2	c3
R1	1	2	3
R2	4	5	6
R3	7	8	9

Row = i, col = j

i=1, j=1,2,3
i=2, j=1,2,3
i=3, j=1,2,3

for

for


```

{
    public static void main(String args[])

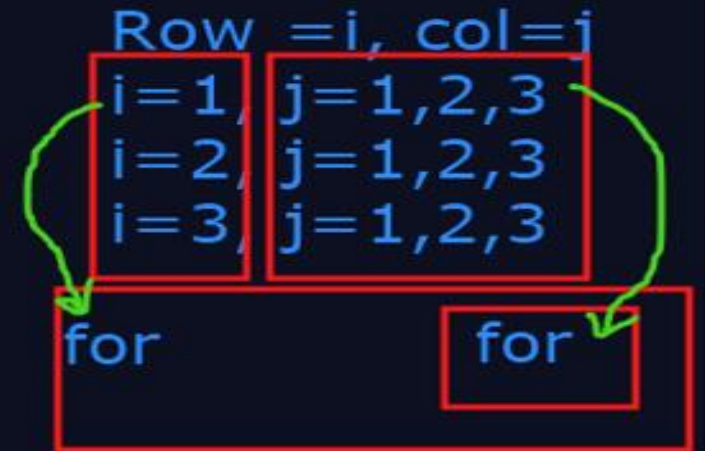
    Scanner s1 = new Scanner(System.in);
    int a1[][] = new int[3][3];

    for(int i=0;i<3;i++)//for-->i(Row)
    {
        for(int j=0;j<3;j++)//for-->j(Col)
        {
            a1[i][j]=s1.nextInt();
        }
    }
    System.out.println("-----");

    for(int i=0;i<3;i++)//for-->i(Row)
    {
        for(int j=0;j<3;j++)//for-->j(Col)
        {
            System.out.print("  "+a1[i][j]);
        }
        System.out.println("");
    }
}

```

	c1	c2	c3
R1	1	2	3
R2	4	5	6
R3	7	8	9



import java.util.Scanner;

```
class P34{  
    public static void main(String args[])  
    {  
    }  
}
```

Employee

-Emp Id
-Emp name

using array


```
P34(int id, String name)
```

```
{  
    this.EmpId = id;  
    this.EmpName = name;  
}
```

```
public static void main(String args[])
```

```
{  
    //P34 t1 = new P34();  
    P34[] a1; //declaration of array  
    a1 = new P34[5]; //allocating memory for 5 objects
```

```
a1[0] = new P34(1, "Rahul");  
a1[1] = new P34(2, "Swati");
```

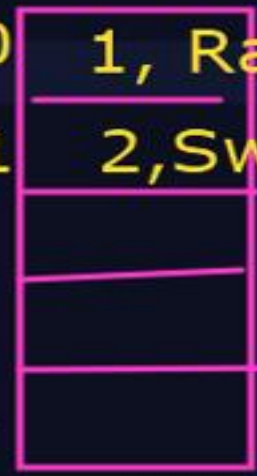
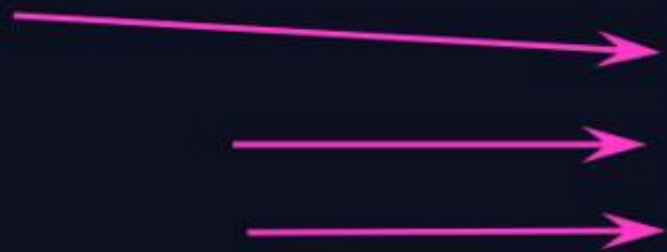
Employee

-Emp Id
-Emp name

using array

0 1, Rahul
1 2, Swati

Object Array



```
a1 = new P34[5]; // alloc
```

Mouse

Select

Text

Draw

Stamp

Spotlight

Eraser

Format

Und



Who can see what you share here? Recording O

```
a1[0] = new P34(1, "Rahul");
```

```
a1[1] = new P34(2, "Swati");
```

```
for(int i=0; i<a1.length; i++)
```

```
{
```

```
    System.out.println("a1["+i+"]:" + a1[i].EmpId + " " + a1[i].EmpName
```

```
}
```

Command Prompt

```
C:\Test>java P34
```

```
a1[0]:1Rahul
```

```
a1[1]:2Swati
```

```
Exception in thread "main" java.lang.NullPointerException: Cannot read file
```

```
ld "EmpId" because "<local1>[<local2>]" is null
```

```
    at P34.main(P34.java:23)
```

```
C:\Test>
```

CDAC Mumbai : Kiran Waghmare


```
this.EmpName = name;
```

Mouse

Select

Text

Draw

Stamp

Spotlight

Eraser

Format

Undo



Who can see what you share here? Recording On

```
public static void main(String args[])
```

```
{
```

```
//P34 t1 = new P34();
```

```
P34 a1[]; //declaration of array
```

```
a1 = new P34[5]; //allocating memory for 5 objects
```

```
a1[0] = new P34(1, "Rahul");
```

```
a1[1] = new P34(2, "Swati");
```

Obj 1

Obj 2

```
for(int i=0; i<a1.length; i++)
```

```
{
```

```
System.out.println("a1[" + i + "]: " + a1[i].EmpId + " " + a1[i].EmpName
```

```
}
```

String:

- sequence of character
- String is a class
- It is used to create string object.
- String is an immutable object.

Character Array:

- char[]={ 'a', 'b', 'c', 'd' };
- char[] = new char{ 'a', 'b', 'c', 'd' };

2 ways to define String:

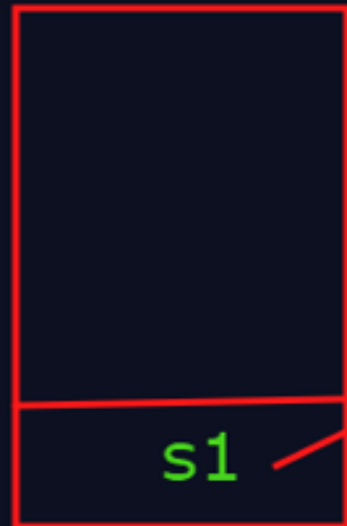
1. String Literals

```
String s1 = "Good morning cdac";  
String s2 = s1.concat("mumbai");
```

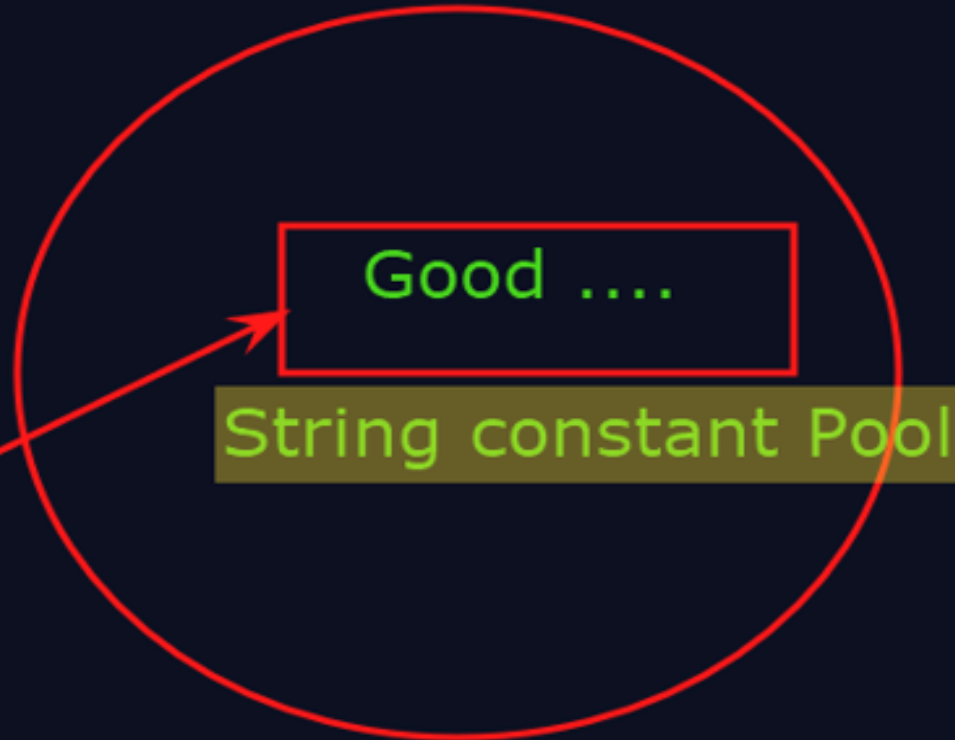
2 ways to define String:

1. String Literals

```
String s1 = "Good morning cdac";
```

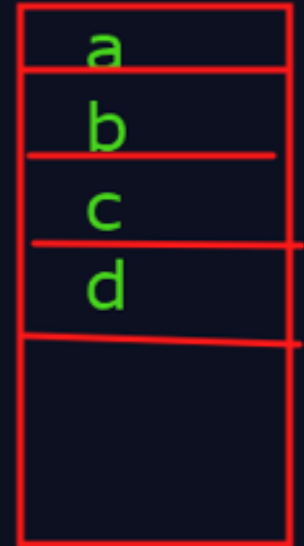


stack



Heap

Character array



String



```
class P37{
```

Who can see what you share here?

```
    public static void main(String args[])  
{
```

```
    String s = "Dream big, stay positive, work hard and enjoy the journey";  
    System.out.println(s);
```

```
    String s1= s.toUpperCase();  
    System.out.println(s1);
```

```
    String s2= s.toLowerCase();  
    System.out.println(s2);
```

```
    int l= s.length();  
    System.out.println(l);
```

```
    char ch= s.charAt(7);  
    System.out.println(ch);
```

```
    int m=s.lastIndexOf('e');  
    System.out.println(m);
```

```
    int n=s.indexOf('e');  
    System.out.println(n);
```

→
c d a c m u m b a i
←
0 1 2 3 4 5 6 7 8 9 10

CDAC Mumbai : Kiran Waghmare

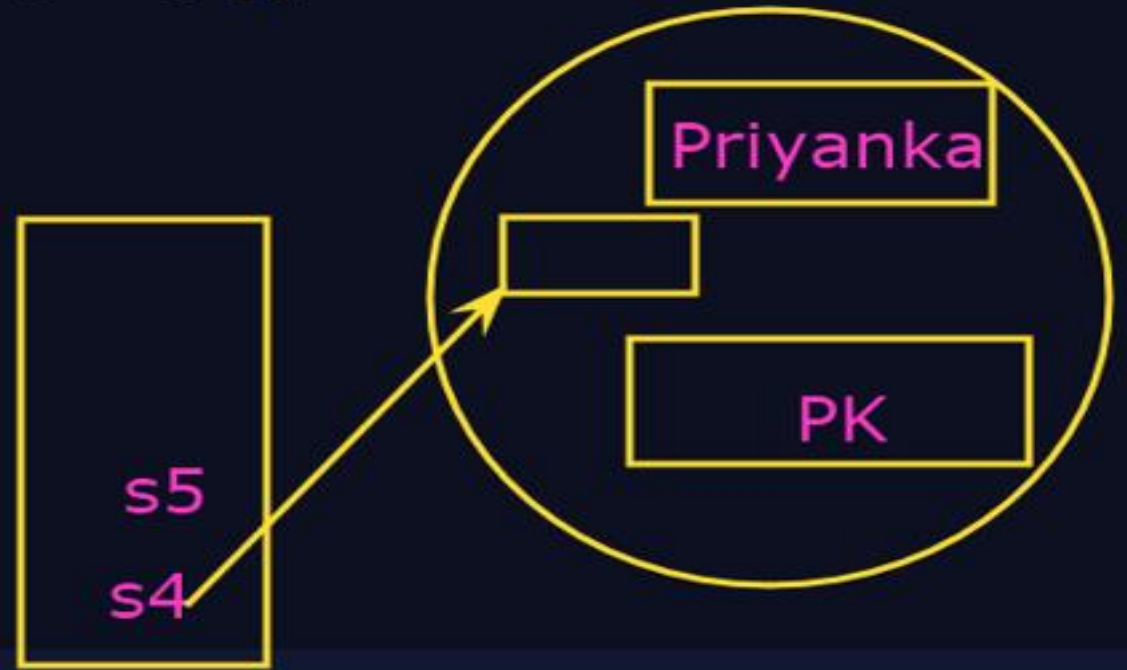


You are screen sharing



Stop Share


```
class P38{  
    public static void main(String args[])  
    {  
        String s1 = "Anjali";  
        System.out.println(s1);  
  
        String s2 = " Swati";  
        System.out.println(s2);  
  
        String s3 = s1.concat(s2);  
        System.out.println(s3);  
  
        String s4 = "Priyanka";  
        s4 = s4.concat("Komal");  
        System.out.println(s4);  
    }  
}
```



s4.concat(s5);

```
class Test{  
    int x;  
    Test(int m)  
    {  
        x=m;  
    }  
  
    public static void main(String args[])  
    {  
  
        Test t1 = new Test(1000);  
        System.out.println(t1.x);  
    }  
}
```

