Fundamentals of Object Oriented Programming

CSN- 103

Dr. R. Balasubramanian

Associate Professor

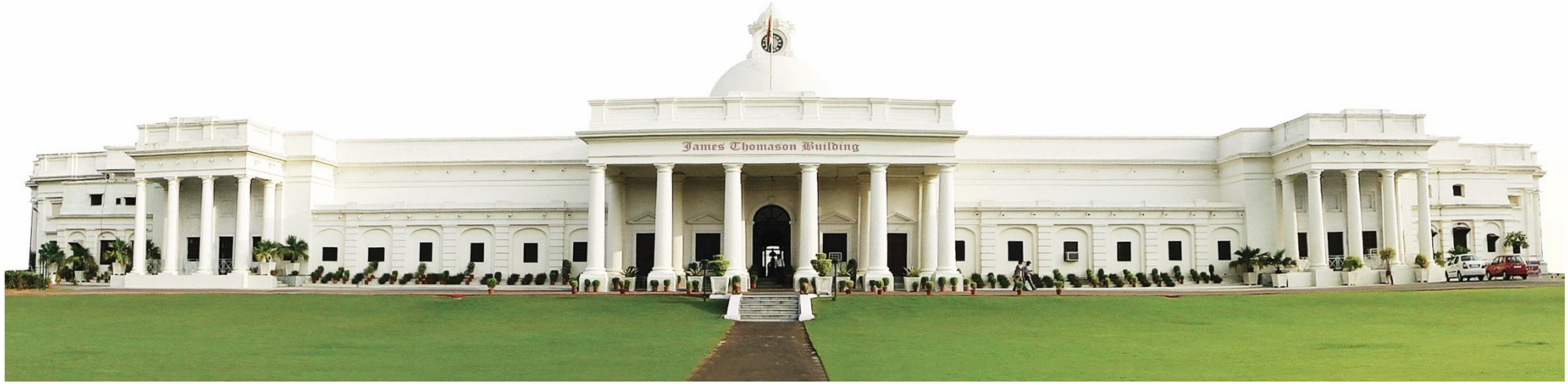
Department of Computer Science and Engineering

Indian Institute of Technology Roorkee

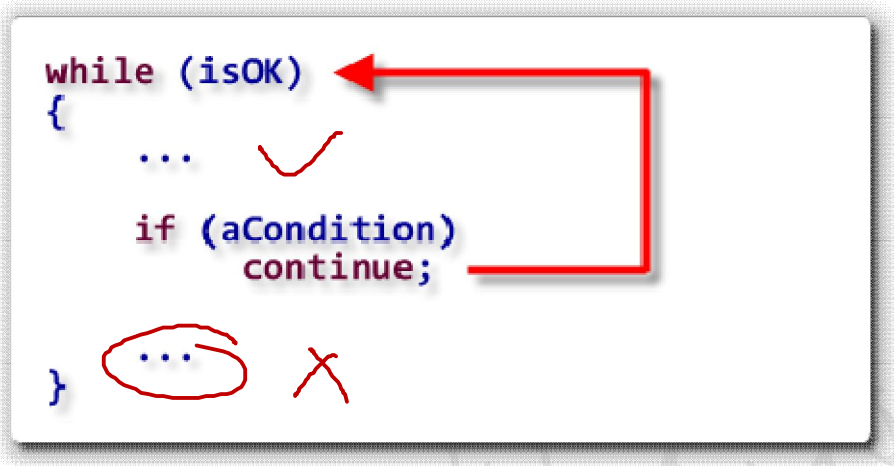
Roorkee 247 667

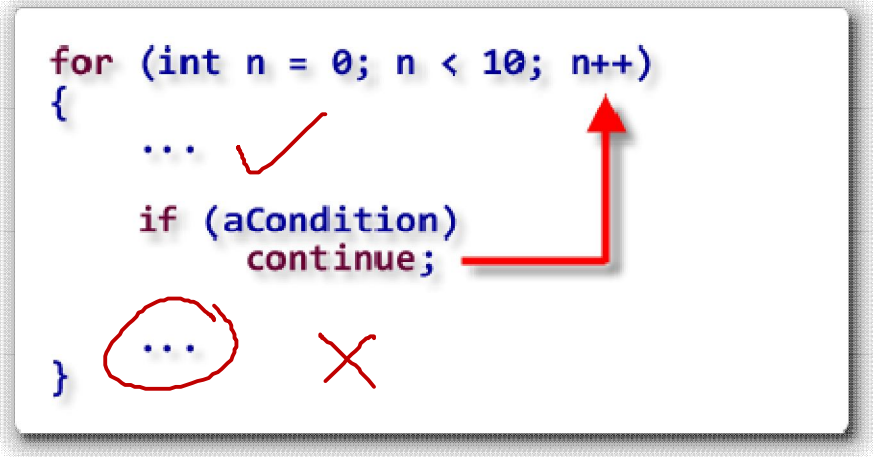
balarfcs@iitr.ac.in

https://sites.google.com/site/balaiitr/



continue Statement






```
sh-4.4$ javac ContExample.java
sh-4.4$ java ContExample
6
7
8
9
10
sh-4.4$
```

```
1  public class ContExample{
2
3      public static void main(String []args){
4         for (int i=1;i<=10;i++)
5         {if (i<=5)
6          continue;
7          System.out.println(i);
8         }
9      }
10 }
11
```

https://ideone.com/LWQKAD

Labeled Loops

```
label1:
for(){
label2:
for(){
if(condition1)
break label1;//break outerloop
if(condition2)
break label2;//break innerloop
}
}
```

Java virtual machine

- The Java compiler produces an intermediate code known as bytecode for a machine that does not exist.
- This machine is called Java virtual Machine and it exists only inside the computer memory.
- It is a simulated computer within the computer and does all major functions of a real computer.

Java virtual machine

- However, the virtual machine code is not machine specific.
- The machine specific code (known as machine code) is generated by the Java interpreter by acting as an intermediary between the virtual machine and the real machine.

printf statement

```
1 public class UseOfPrintf{
2
3 public static void main(String []args){
4 int a=10;
5 int b=5;
6 int sum=a+b;
7 System.out.printf("Sum of Two numbers=%d\n", sum);
8 }
9 }
```

Terminal

```
sh-4.3$ javac UseOfPrintf.java
sh-4.3$ java UseOfPrintf
Sum of Two numbers=15
sh-4.3$
```

```java
public class HelloWorld{

    public static void main(String []args){
        // System.out.println("Hello World");
        float a=10.234f;
        float b=5.145f;
        float sum=a+b;
        System.out.printf("Sum of Two numbers=%.1f\n", sum);
    }
}

```

Terminal

```
sh-4.3$ javac HelloWorld.java
sh-4.3$ java HelloWorld
Sum of Two numbers=15.4
sh-4.3$
```

```
1  public class HelloWorld{
2
3      public static void main(String []args){
4        // System.out.println("Hello World");
5        float a=10.234f;
6        float b=5.145f;
7        float sum=a+b;
8        System.out.printf("Sum of Two numbers=%.2f\n", sum);
9      }
10 }
11
```

```
Terminal
sh-4.3$ javac HelloWorld.java
sh-4.3$ java -Xmx128M -Xms16M HelloWorld
Sum of Two numbers=15.38
sh-4.3$
```

Data Types in C

Data Types	Format String
int	%d
float	%f
long	%ld
double	%lf
long double	%lf
char	%c / %s

Excercises

1. Write a JAVA program to find all Armstrong numbers in the range of 0 and 999.

   An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since $3^3 + 7^3 + 1^3 = 371$

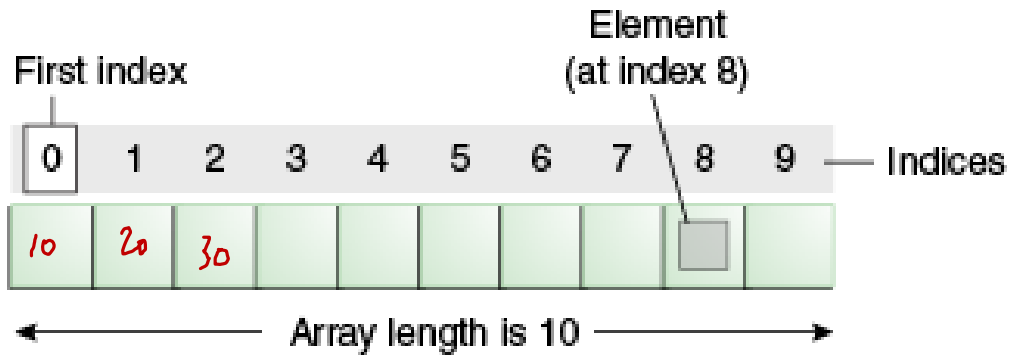
2. If a=10, b=5, c=15, d=3 and e=2, all are integers. Then what will be the output of the following fragment of Java code.

```
int f= a & b | c << d >> e;

System.out.println("f=" +f);
```

Arrays

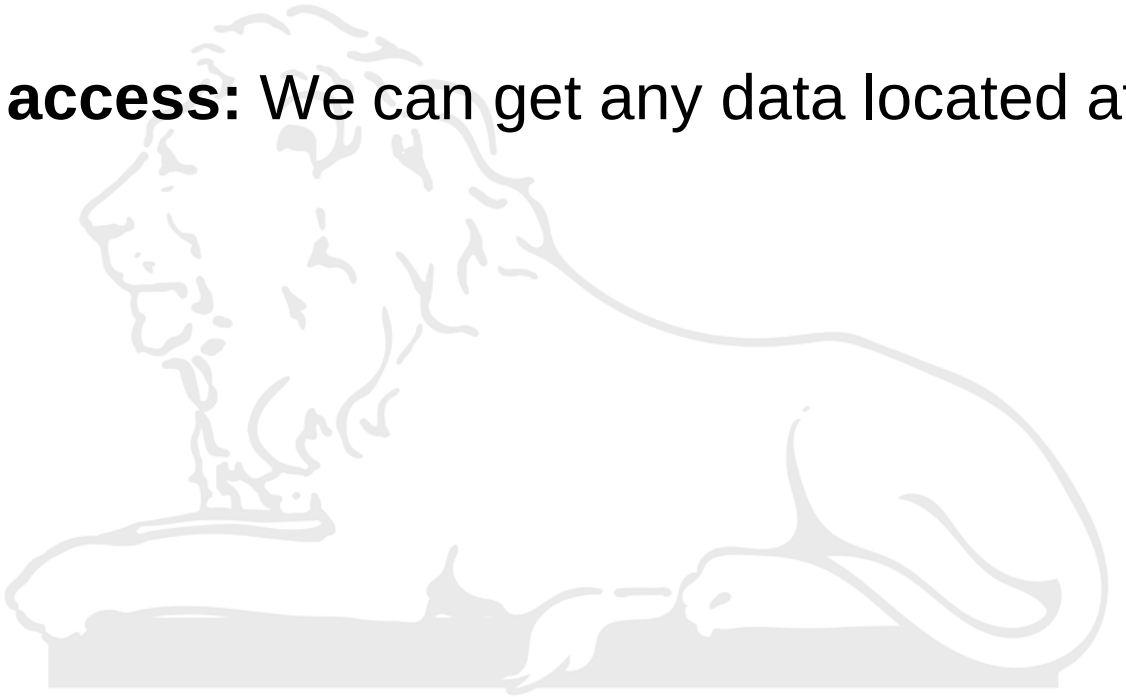
- **Java array** is an object that contains elements of similar data type. It is a data structure where we store similar elements. We can store only fixed set of elements in a java array.
  - group of contiguous or related data items that share a common name.
  - Array in java is index based, first element of the array is stored at 0 index.



Advantage of Java Array

- **Code Optimization:** It makes the code optimized, we can retrieve or sort the data easily.

- **Random access:** We can get any data located at any index position.



Disadvantage of Java Array

- **Size Limit:** We can store only fixed size of elements in the array. It doesn't grow its size at runtime. To solve this problem, collection framework is used in java.

Types of Array in java

There are two types of array.

- Single Dimensional Array
- Multidimensional Array

Single Dimensional Array in java

Syntax to Declare an Array in java

```
dataType[] arr; (or)
dataType []arr; (or)
dataType arr[];
```

Example

```
  double[] myList; // preferred way. or
  double myList[]; // works but not preferred way.
```

Instantiation of an Array in java

You can create an array by using the new operator with the following syntax:

```
arrayRefVar=new datatype[size];
```

It goes like this:

```
datatype[ ] arrayRefVar;
arrayRefVar=new datatype[size];
```

```
This is same as
datatype[ ] arrayRefVar=new datatype[size];
```