## Unit-2

# static keyword:

The **static keyword** in is used for memory management mainly. We can apply static keyword with variables, methods, blocks and nested classes. The static keyword belongs to the class than an instance of the class.

The static can be:

1. static Variable (also known as a class variable)
2. static Method (also known as a class method)
3. static Block
4. Nested class

## 1) Java static variable

If you declare any variable as static, it is known as a static variable.

- The static variable can be used to refer to the common property of all objects (which is not unique for each object), for example, the company name of employees, college name of students, etc.
- The static variable gets memory only once in the class area at the time of class loading.

### Advantages of static variable

It makes your program **memory efficient** (i.e., it saves memory).

```
class Student{
    int rollno;
    String name;
    String college="Accurate";
}
```

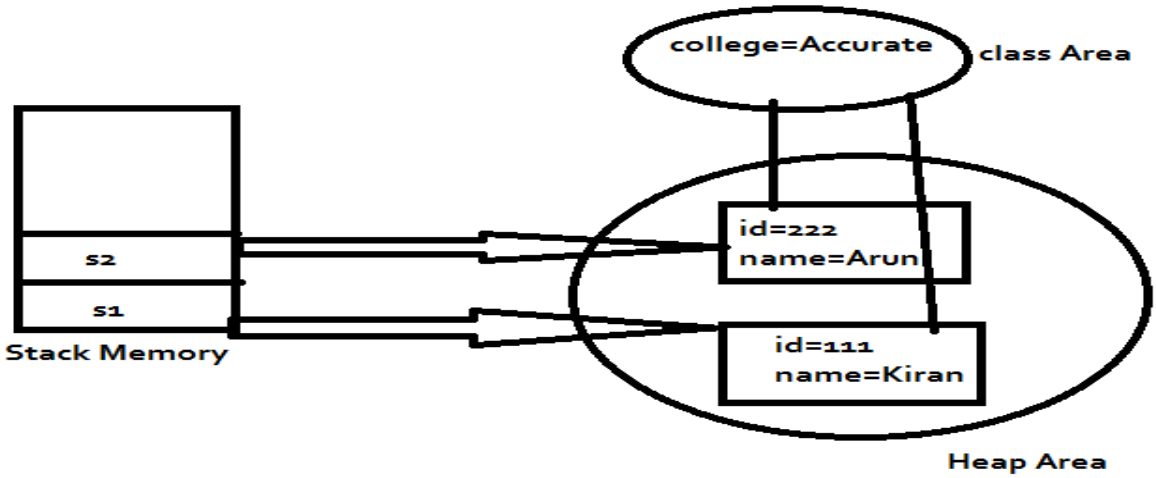
Suppose there are 500 students in my college, now all instance data members will get memory each time when the object is created. All students have its unique rollno and name, so instance data member is good in such case. Here, "college" refers to the common property of all objects. If we make it static, this field will get the memory only once.

### Example of static variable

```
class Student{
  int rollno;//instance variable
  String name;
  static String college ="Accurate";//static variable
  //constructor
  Student(int r, String n){
```

```
  rollno = r;
  name = n;
  }
  //method to display the values
  void display (){System.out.println(rollno+" "+name+" "+college);}
}
//Test class to show the values of objects
public class TestStaticVariable1{
 public static void main(String args[]){
 Student s1 = new Student(111,"Kiran");
 Student s2 = new Student(222,"Arun");
 //we can change the college of all objects by the single line of code
 //Student.college="AIMT";
 s1.display();
 s2.display();
 }
}
```

Output:
111 Kiran Accurate
222 Arun Accurate




## 2) static method:

If you apply static keyword with any method, it is known as static method.

- A static method belongs to the class rather than the object of a class.
- A static method can be invoked without the need for creating an instance of a class.
- A static method can access static data member and can change the value of it.

**Example of static method**

```
class Student{
    int rollno;
```

```
    String name;
    static String college = "Accurate";
    //static method to change the value of static variable
    static void change(){
    college = "AIMT";
    }
    //constructor to initialize the variable
    Student(int r, String n){
    rollno = r;
    name = n;
    }
    //method to display values
    void display(){System.out.println(rollno+" "+name+" "+college);}
}
//Test class to create and display the values of object
public class TestStaticMethod{
   public static void main(String args[]){
   Student.change();//calling change method
   //creating objects
   Student s1 = new Student(111,"Kiran");
   Student s2 = new Student(222,"Arun");
   Student s3 = new Student(333,"Rohit");
   //calling display method
   s1.display();
   s2.display();
   s3.display();
   }
```

Output:
111 Kiran AIMT
222 Arun AIMT
333 Rohit AIMT

**Restrictions for the static method**

There are two main restrictions for the static method. They are:

1.The static method can not use non static data member or call non-static method directly.
2. this and super cannot be used in static context.

```
class A{
 int a=40;//non static

 public static void main(String args[]){
  System.out.println(a);
 }
}
```

Output:Compile Time Error

**Q) Why is the Java main method static?**

Ans) It is because the object is not required to call a static method. If it were a non-

static method, JVM creates an object first then call main() method that will lead the problem of extra memory allocation.

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## 3) static block:

- Is used to initialize the static data member.
- It is executed before the main method at the time of classloading.

**Example of static block**

```
class A2{
  static{
System.out.println("static block is invoked");
}
  public static void main(String args[]){
   System.out.println("Hello main");
  }
}
```

Output:static block is invoked
Hello main