# Static Class Members

static keyword

- **static** is a non-access modifier in Java which is applicable for the following:

    1. Variables
    2. Methods
    3. Blocks

Static variables

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)
- The static variable gets memory only once in the class area at the time of class loading.
- A single copy of a class's static variable is shared by all instances of the class.
- If changes are made to static variable, all other instances will see the effect of the change.
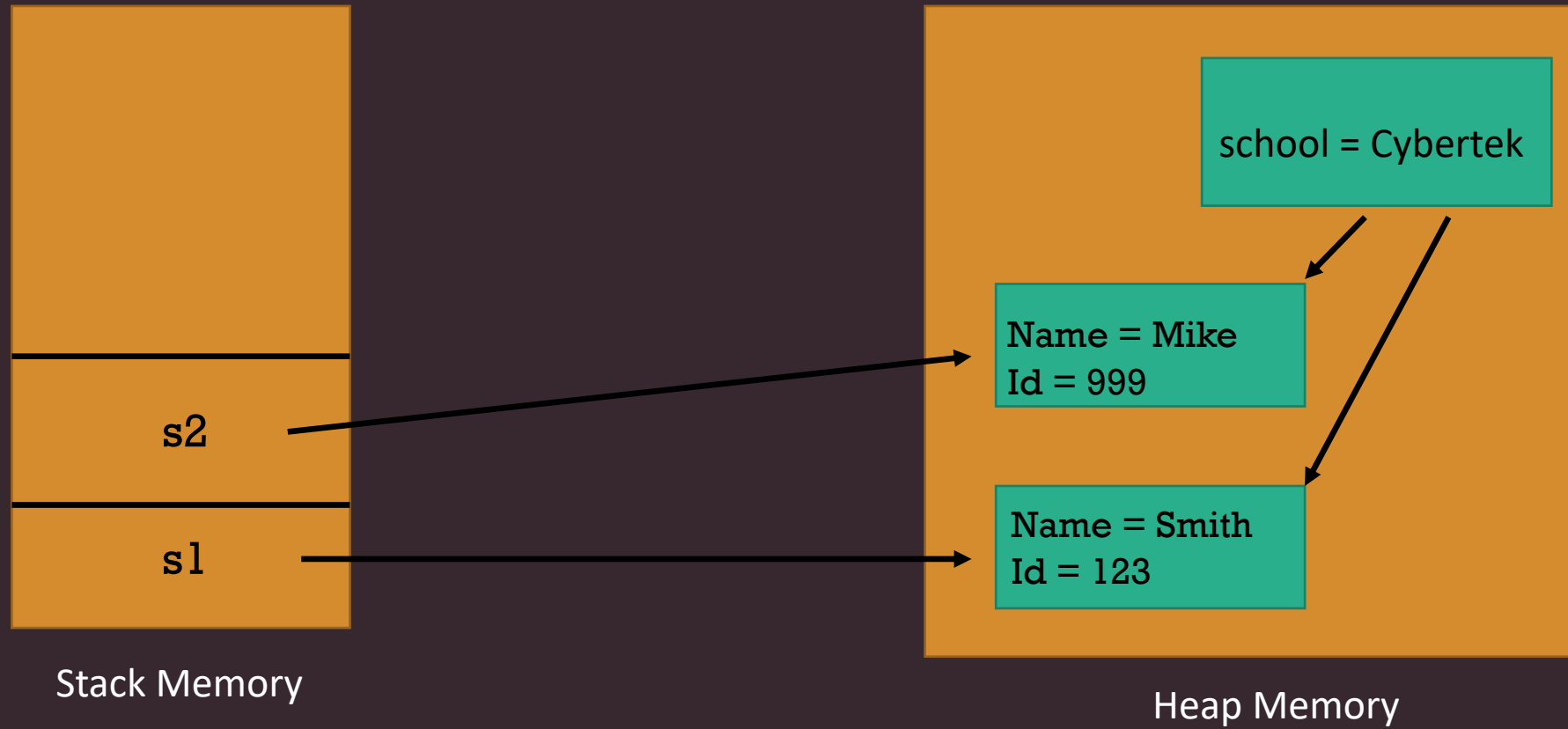
Instance Variable

```java
class Dog {

    private String name;

    public Dog(String name) {
        this.name = name;
    }

    public void printName() {
        System.out.println("name= " + name);
    }
}

public class Main {

    public static void main(String[] args) {
        Dog rex = new Dog("rex"); // create instance (rex)
        Dog fluffy = new Dog("fluffy"); // create instance (fluffy)
        rex.printName(); // prints rex
        fluffy.printName(); // prints fluffy
    }
}
```

OUTPUT:
rex
fluffy

Static Variable

```java
class Dog {

    private static String name;

    public Dog(String name) {
        Dog.name = name;
    }

    public void printName() {
        System.out.println("name= " + name);
    }
}

public class Main {

    public static void main(String[] args) {
        Dog rex = new Dog("rex"); // create instance (rex)
        Dog fluffy = new Dog("fluffy"); // create instance (fluffy)
        rex.printName(); // prints fluffy
        fluffy.printName(); // prints fluffy
    }
}
```

OUTPUT:
fluffy
fluffy

Static methods

If you declare any method as static, it is known as a static method.
- A method that can be called using a class name, without creating an object.
- Objects can also call static methods.

Static methods

```java
class Calculator {

    public static void printSum(int a, int b) {
        System.out.println("sum= " + (a + b));
    }
}

public class Main {

    public static void main(String[] args) {
        Calculator.printSum(5, 10);
        printHello(); // shorter form of Main.printHello();
    }

    public static void printHello() {
        System.out.println("Hello");
    }
}
```
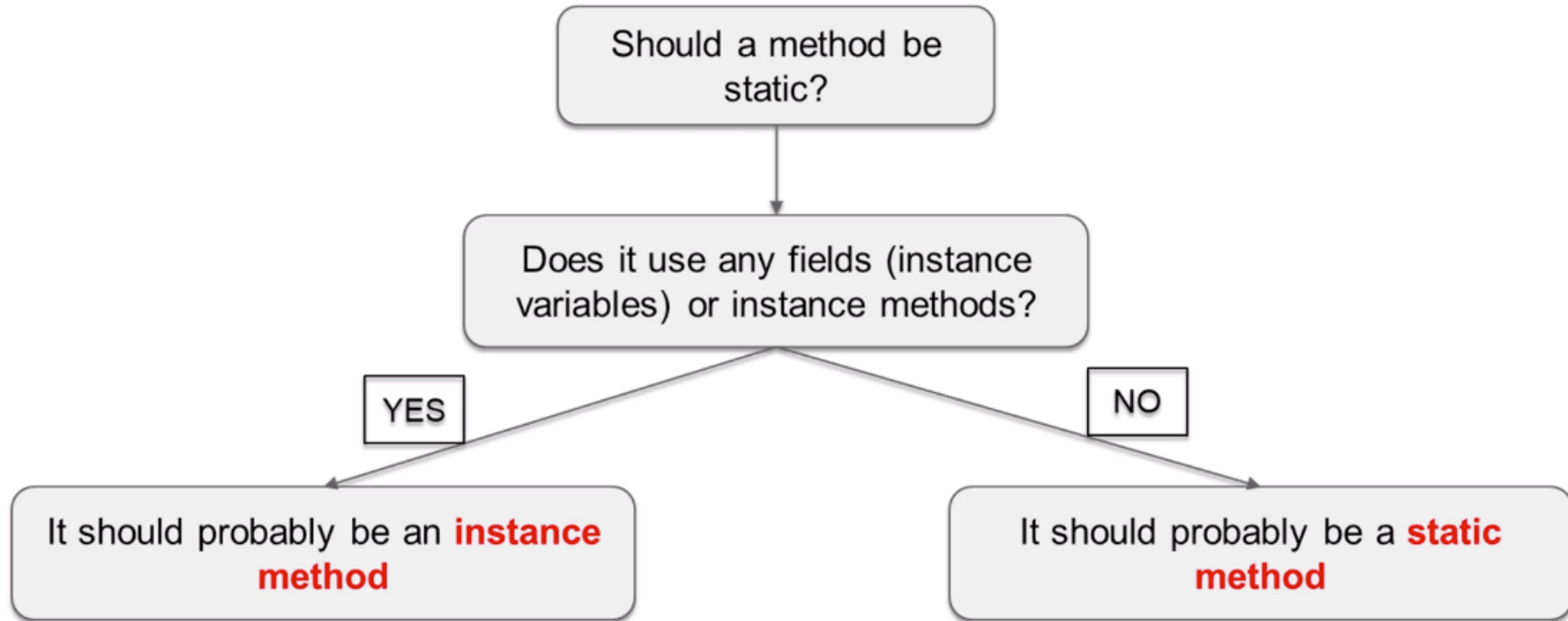
static methods are called as
ClassName.methodName(); or
methodName(); only if in the same class

in this example
Calculator.printSum(5, 10);
printHello();

Static or instance method?

Static method	Instance method
Static methods can not access instance methods and instance variables directly	Instance methods can access instance methods and instance variables directly
In static methods we can not use the "this" keyword	Instance methods can also access static methods and static variables directly

Static blocks

- Static block is a set of instructions that is run only once when a class is loaded into memory.

- A static block is also called a static initialization block.

```java
public class Car {

    static {

        //static block

    }
}
```

Static import

- With the help of static import, we can access the static members of a class directly without class name or any object.

- With the help of import, we are able to access classes and interfaces which are present in any package. But using static import, we can access all the static members (variables and methods) of a class directly without explicitly calling class name.