Java Training

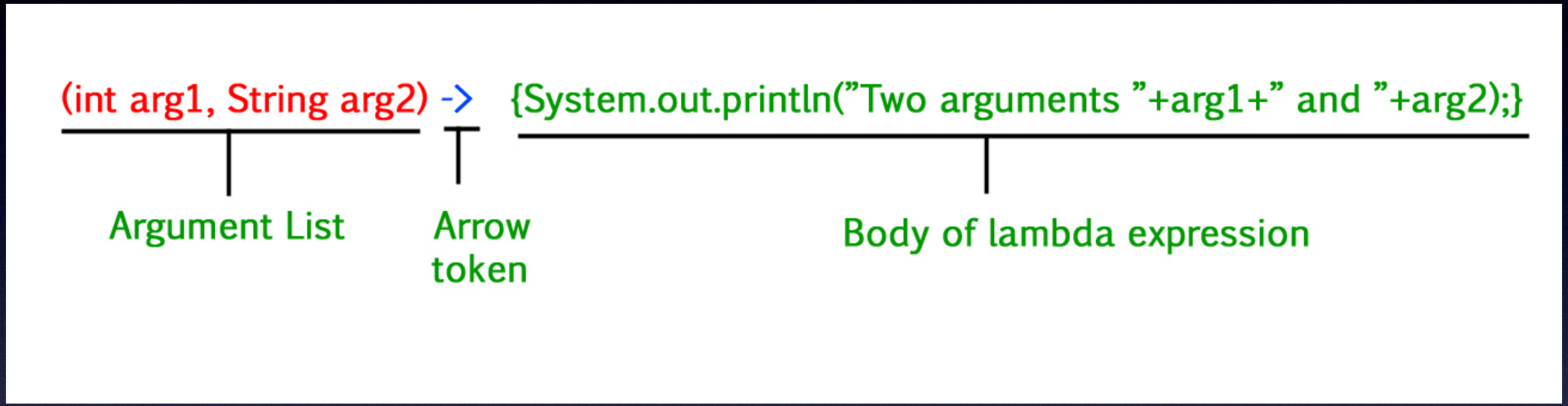
Jan - Feb 2023

Lambda Expressions

- Helps us to write our code in functional style.
- Describe what you want, rather than how to get it.
- Provides a clear way to implement Single Abstract Method by using an expression
- It is very useful in collection library in which it helps to iterate, filter and extract data.

Lambda Expressions Syntax

- Standard Syntax
- Parameter Type
- Multiple Lines of Code
- Single Parameter with Inferred Type
- Method References
- No Parameter

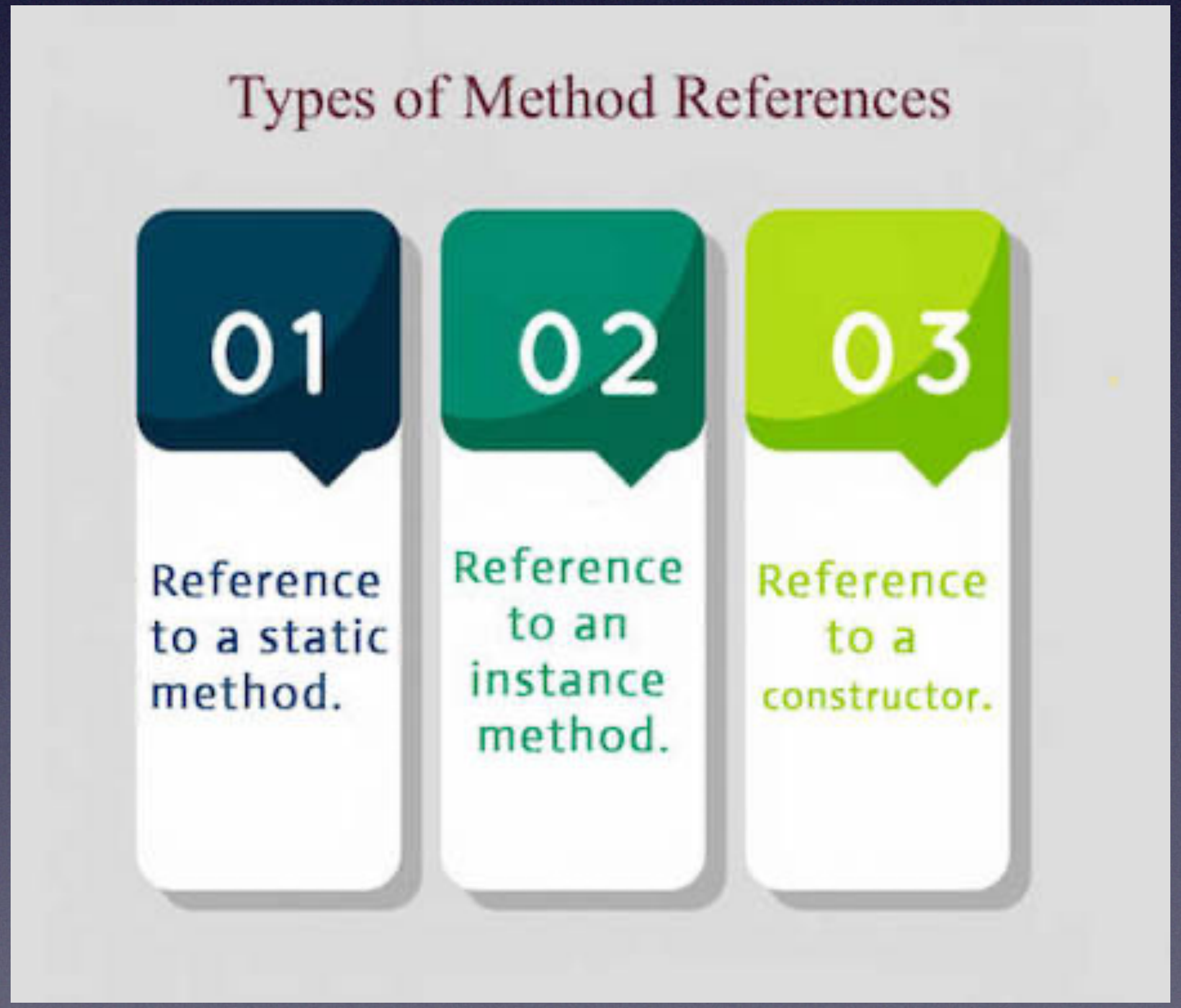


```
(int arg1, String arg2) -> {System.out.println("Two arguments "+arg1+" and "+arg2);}
```

Method Reference

- It is used to refer method of functional interface .
- It is compact and easy form of lambda expression.

- 01: ContainingClass::staticMethodName
- 02: containingObject::instanceMethodName
- 03: ClassName::new


Types of Method References
01
Reference to a static method.
02
Reference to an instance method.
03
Reference to a constructor.

Functional Interface

- An Interface that contains only one abstract method.
- It can have any number of default and static methods.
- It can also declare methods of object class.
- Also known as Single Abstract Method Interfaces.

StringJoiner

- Used for joining Strings making use of a delimiter, prefix, & suffix.
- The default value is returned only when the StringJoiner is empty.
- merge() : It adds the contents of the given StringJoiner **without prefix and suffix** as the next element.
- Collectors.joining() internally uses StringJoiner to perform the joining operation.

Optional

- It is a public final class.
- Which is used to deal with NullPointerException in Java application.
- Provides methods to check the presence of value.

forEach

- Java provides a new method forEach() to iterate the elements.
- It is defined in Iterable and Stream interfaces.
- It is a default method defined in the Iterable interface.
- Collection classes which extends Iterable interface can use forEach() method to iterate elements.
- This method takes a single parameter which is a functional interface.
- So, you can pass lambda expression as an argument.

Date/Time API

- Java has introduced a new Date and Time API since Java 8.
- The java.time package contains Java 8 Date and Time classes.

Drawbacks of existing Date/Time API's

- **Thread safety:** The existing classes such as Date and Calendar does not provide thread safety. Hence it leads to hard-to-debug concurrency issues that are needed to be taken care by developers. The new Date and Time APIs of Java 8 provide thread safety and are immutable, hence avoiding the concurrency issue from developers.

- **Bad API designing:** The classic Date and Calendar APIs does not provide methods to perform basic day-to-day functionalities. The Date and Time classes introduced in Java 8 are ISO-centric and provides number of different methods for performing operations regarding date, time, duration and periods.

- **Difficult time zone handling:** To handle the time-zone using classic Date and Calendar classes is difficult because the developers were supposed to write the logic for it. With the new APIs, the time-zone handling can be easily done with Local and ZonedDate/Time APIs.

Default Methods

- Java provides a facility to create default methods inside the interface.
- Methods which are defined inside the interface and tagged with default keyword are known as default methods.
- These methods are non-abstract methods and can have method body.

Why Default Method ?

- Before Java 8, interfaces could have only abstract methods.
- The implementation of these methods has to be provided in a separate class.
- So, if a new method is to be added in an interface, then its implementation code has to be provided in the class implementing the same interface.
- To overcome this issue, Java 8 has introduced the concept of default methods which allow the interfaces to have methods with implementation without affecting the classes that implement the interface.

Nashorn JavaScript Engine

- Nashorn is a JavaScript engine.
- It is used to execute JavaScript code dynamically at JVM.
- You can execute JavaScript code by two ways
    - Using jjs command-line tool, and
    - By embedding into Java source code.

Nashorn cont.

- The new default JavaScript engine for the JVM as of Java 8.
- Many sophisticated techniques have been used to make Nashorn orders of magnitude more performant than its predecessor called Rhino, so it is a worthwhile change.

Collectors

- Collectors is a final class that extends Object class.
- It provides reduction operations, such as accumulating elements into collections, summarizing elements according to various criteria etc.

Stream

- Java 8 java.util.stream package consists of classes, interfaces and an enum to allow functional-style operations on the elements.
- It performs lazy computation. So, it executes only when it requires.