Java Feature Overview

From Java 8 to Java 11 to Java 17

CF, 21.03.2021

Process: JEP

Java Enhancement Proposal

- JEP 0: Index
  - http://openjdk.java.net/jeps/0
  - Nice list to check many changes.
- Java 11-17: JEP 325, 334, 338 - 398
- Mark Reinhold

Java Support Roadmap

LTS vs MTS

- LTS: Long Term Support (Java 8, Java 11, Java 17)
  - Java 8: 03.2014 - 03.2022, extended support: 12.2030.
  - Java 11: 09.2018 - 09.2023, extended support: 09.2026
  - Java 17: 09.2021 - 09.2026, extended support: 09.2029
- MTS: Medium Term Support (9-10, 12-16)
- New Features appear in MTS versions as “preview”.
- https://www.oracle.com/java/technologies/java-se-support-roadmap.html

JDK

OracleJDK versus OpenJDK

- Oracle: Commercial use requires Licen$e
- OpenJDK: OpenSource, no support.
- Azul: Fast VM.

Java 11

Java 11

References

- http://openjdk.java.net/jeps/0
- https://www.baeldung.com/java-11-new-features

Java 11

- String methods
  - isBlank, strip, stipLeading, stripTrailing, repeat.
- File methods (`java.nio.Files`)
  - readString and writeString as static methods to Files.
- Conversion between List and Array:
  - List stringList = Arrays.asList(“a”,”b”,”c”)
  - String[] array = stringList.toArray(String[]::new)

Java 11

Local Variable Syntax for Lambda Expressions

- Local Variable Syntax: You may use the word var and the type is inferred.
- Type Inference

```
var str = “Java 11”;
var list = new ArrayList<String>();
```

- Local Variable Syntax may be used in Lambda expressions

```
(var a, var b) -> a + b
```

- May be used to specify an annotation within a Lambda expression

Execution: Implementing against an Interface

```
Shape shape = new Circle();

shape.rotate(-90);
```

Java 12

Java 12

- Teeing Collector for Java Streams

```
Collector<T, ?, R> teeing(
  Collector<? super T, ?, R1> downstream1,
  Collector<? super T, ?, R2> downstream2,
  BiFunction<? super R1, ? super R2, R> merger)
```

Usage:

```
@Test
public void givenSetOfNumbers_thenCalculateAverage() {
    double mean = Stream.of(1, 2, 3, 4, 5)
      .collect(Collectors.teeing(Collectors.summingDouble(i -> i),
        Collectors.counting(), (sum, count) -> sum / count));
    assertEquals(3.0, mean);
}
```

Java 12

- Switch Expressions (JEP 354) (will be continued in Java 13)
- See below.

Java 13

Java 13

References

- http://openjdk.java.net/jeps/0
-

Java 13

Switch Expressions (JEP 354) / Keyword yield

- There is a new keyword: yield
- The switch statement can be considered as a function that returns a value.
- Instead of return, yield is used.

Java 13

Text Blocks

- Improve the inline creation of String that newline and double quote (“).
- Useful for inline creation of JSON.
- Maybe useful in specifying input data for Unit Tests.

Java 14

Java 14

References

- https://www.baeldung.com/java-14-new-features
-

Java 14

instanceOf Pattern Matching (JEP 305) (PREVIEW)

- Automatically casts an object inside an if(object instanceOf …) { } block to the respective type.
- Simplifies syntax. Still explicit (compare this with Kotlin).
- Instead of
- write

Java 14

record (JEP 359) (PREVIEW)

- Records are specifically to streamline the definition of POJOs / DTO.

```
public record User(int id, String password) { };
```

- Defines a class with fields id and password with
  - getters, setters, toString(), equals(), hashCode()

- See **code example**.

Java 15

Java 15

- https://www.baeldung.com/java-15-new
- Sealed Classes
  - https://cr.openjdk.java.net/~briangoetz/amber/datum.html
  -

Java 15

Sealed Class (JEP 360, 397)

- Will be continued in Java 16.

Java 16

Java 16

References

- https://www.techgeeknext.com/java/java16-features
- https://www.infoworld.com/article/3569150/jdk-16-the-new-features-in-java-16.html
- https://docs.oracle.com/en/java/javase/16/language/java-language-changes.html
-

Java 16

Sealed Class (JEP 360, 397)

- https://docs.oracle.com/en/java/javase/16/language/sealed-classes-and-interfaces.html
- Fine grained control over inheritance.
- A class `A` can specify explicitly which outer classes are allowed to use `extends A`

```
public sealed class Shape permits Circle, Square, Rectangle {

}
```

- Classes extending the sealed class need to be in the same module/package.

Java 17

Java 17

- https://www.techgeeknext.com/java/java17-features
-

Outlook (beyond 17)

Outlook

- JEP 402: Unify the Basic Primitives with Objects (Preview)
  - http://openjdk.java.net/jeps/402
- JEP 169: Value Objects
  - http://openjdk.java.net/jeps/169

Draft: Concise Method Bodies

- http://openjdk.java.net/jeps/8209434
-