

Annotations



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Annotations

Annotations are used to add **metadata** to Java source code.



Use Cases for Annotations

Provide additional information to the **compiler**

@Override

@SafeVarargs

@Deprecated

@FunctionalInterface

@SuppressWarnings



Use Cases for Annotations

Processing annotations at **compile time** using an
annotation processor

Lombok

<https://projectlombok.org>

Immutables

<https://immutables.github.io>

MapStruct

<https://mapstruct.org>



Use Cases for Annotations

Processing annotations at **runtime**

Spring Framework
<https://spring.io>

Java EE / Jakarta EE
<https://jakarta.ee>

Jackson
<https://github.com/FasterXML/jackson>

JUnit
<https://junit.org>



Applying Annotations

Declaration annotations

Applied to declarations of
classes, fields, methods,
local variables etc.

Type annotations

Applied to types
to enhance the type system



Declaration vs. Type Annotations

```
@NonNull String name;
```



Declaration vs. Type Annotations

Declaration annotation

```
@NonNull String name;
```

The **annotation** pertains to
the **declaration** of the variable



Declaration vs. Type Annotations

Type annotation

```
@NonNull String name;
```

The **annotation** pertains to
the **type** of the variable



Declaration vs. Type Annotations

Type annotation

```
@NonNull String name;
```

The type of the variable is “**NonNull String**”



Declaration vs. Type Annotations

Declaration annotation

```
@NonNull String name;
```

Type annotation

```
@NonNull String name;
```



Declaration vs. Type Annotations

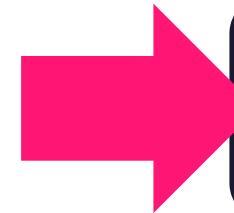
Type annotation

```
@Target(ElementType.TYPE_USE)
public @interface NonNull {
    // ...
}
```



Declaration vs. Type Annotations

Declaration annotation



```
@NonNull String name;
```

Type annotation

```
@NonNull String name;
```



Using Type Annotations

Checker Framework
<https://checkerframework.org>



Summary



Use cases for annotations

- Special annotations for the compiler
- Compile time processing
- Runtime processing

Declaration and type annotations

Define your own annotation

- `@interface`
- Annotation elements
- Applying meta-annotations

Working with annotations at runtime



Up Next:

Optional

