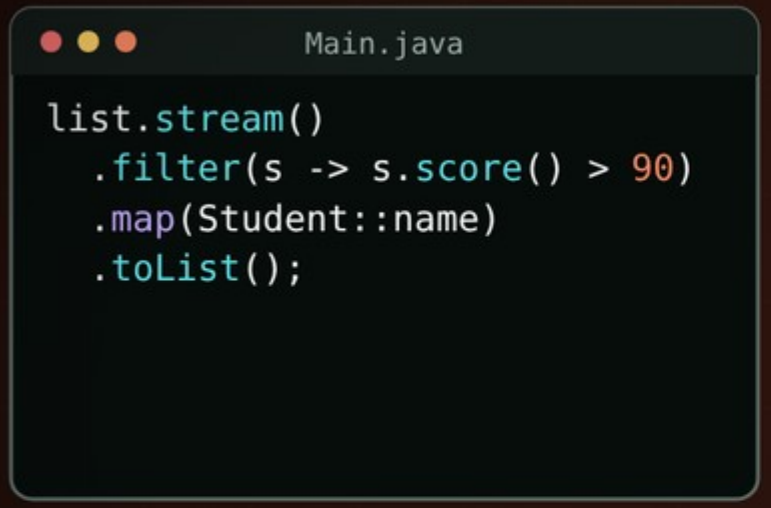
LESSON 9



Java

Lambdas & Streams

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JAVA PROGRAMMING

LESSON 9

Generics, Lambdas and Streams

Type parameters, lambda expressions, method references and the Stream API

Generics

Box.java

```java
class Box<T> {
    private final T value;
    Box(T value) { this.value = value; }
    T get() { return value; }
}
Box<String> b = new Box<>("Kabul");
String s = b.get();             // no cast needed

static <T extends Comparable<T>> T max(T a, T b) {
    return a.compareTo(b) >= 0 ? a : b;
}
```

- The angle brackets in List of String are generics. They let one class or method work with …
- Write your own generic classes with a type parameter like T.

01

Lambda Expressions

Lambdas.java

```
Runnable hello = () -> System.out.println("Salaam");
Comparator<String> byLen = (a, b) -> a.length() - b.length();
Predicate<Integer> isEven = n -> n % 2 == 0;

names.forEach(System.out::println);     // method reference
names.removeIf(n -> n.isBlank());
```

- A lambda is a short anonymous function: parameters, an arrow, and a body. It implements a …
- Method references, with two colons, are even shorter when a lambda just calls one existing …

02

The Stream API



- students — .stream()
- filter — score ≥ 75
- map — Student::name

03

Collectors

Report.java

```java
List<String> top = students.stream()
    .filter(s -> s.score() >= 90)
    .map(Student::name)
    .sorted()
    .toList();

Map<String, Double> avgByCity = students.stream()
    .collect(Collectors.groupingBy(Student::city,
             Collectors.averagingDouble(Student::score)));
```

- Collectors do the heavy lifting: groupingBy groups items into a map, counting counts them, …
- One expression can turn a list of students into the average score per city.

04

Optional

Find.java

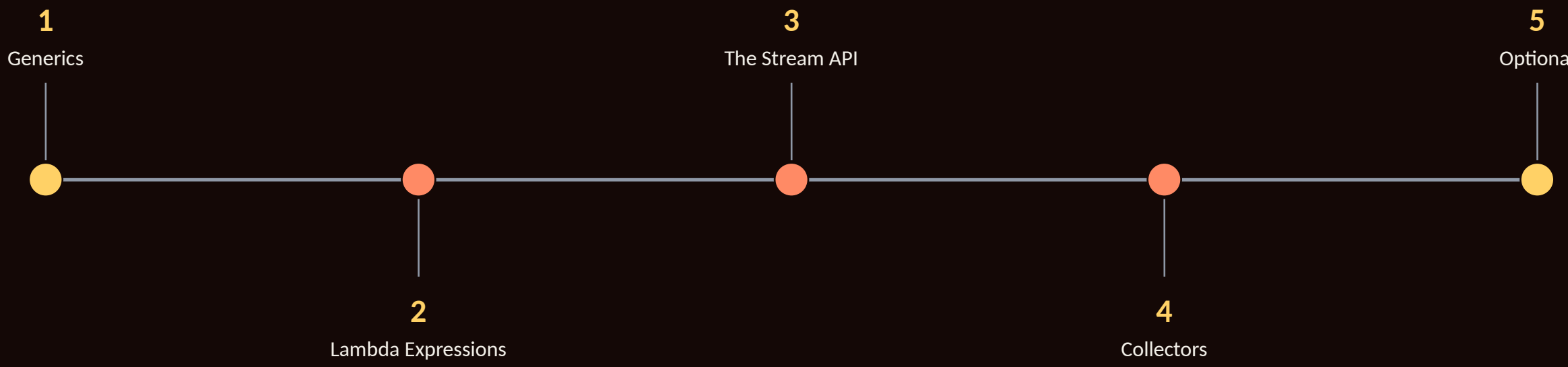
```
Optional<Student> best = students.stream()
    .max(Comparator.comparing(Student::score));

String name = best.map(Student::name).orElse("nobody");
best.ifPresent(s -> System.out.println("Top: " + s));
```

- Optional is a box that may or may not hold a value. Methods return it instead of null, so …
- Use orElse for a default, map to transform, and ifPresent to act only when a value exists.

05

Lesson Map


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Generics
2
Lambda Expressions
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The Stream API
4
Collectors
5
Optional

Sources and Further Reading





Thank you for watching

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