



Beyond Lambdas, the aftermath

Spotify 2016



@DanielSawano

@DanielDeogun



ABOUT US...



Daniel Deogun



Daniel Sawano

Omegapoint

Stockholm - Gothenburg - Malmoe - Umea - New York

[insert code here]

OPTIONALS 1

```
7  final Oracle oracle = new Oracle();
8
9  String _() {
10     final Advise advise = currentAdvise();
11
12     if (advise != null) {
13         return advise.cheap();
14     }
15     else {
16         return oracle.advise().expensive();
17     }
18 }
```

OPTIONALS 1

```
25  final Oracle oracle = new Oracle();
26
27  String _() {
28      final Advise advise = currentAdvise();
29
30      return Optional.ofNullable(advise)
31                      .map(Advise::cheap)
32                      .orElse(oracle.advise().expensive());
33  }
```

OPTIONALS 1

```
25 final Oracle oracle = new Oracle();
26
27 String _() {
28     final Advise advise = currentAdvise();
29
30     return Optional.ofNullable(advise)
31         .map(Advise::cheap)
32         .orElseGet( () -> oracle.advise().expensive());
33 }
```

OPTIONALS 2

```
26 String _(final Optional<String> optOfSomeValue) {
27
28     return optOfSomeValue.map(v -> calculate(v))
29         .filter(someCriteria())
30         .map(v -> transform(v))
31         .orElseGet(() -> completelyDifferentCalculation());
32
33 }
```

OPTIONALS 2

```
26 String _(final Optional<String> optOfSomeValue) {
27
28     if (optOfSomeValue.isPresent()) {
29         final String calculatedValue = calculate(optOfSomeValue.get());
30         if (someCriteria().test(calculatedValue)) {
31             return transform(calculatedValue);
32         }
33     }
34
35     return completelyDifferentCalculation();
36
37 }
```


OPTIONALS 2

```
26 String _() {
27     return value()
28         .flatMap(v -> firstCalculation(v))
29         .orElseGet(() -> completelyDifferentCalculation());
30 }
31
32 Optional<String> value() {
33     return Optional.of(someValue());
34 }
35
36 Optional<String> firstCalculation(final String v) {
37     return Optional.of(calculate(v))
38         .filter(someCriteria())
39         .map(value -> transform(value));
40 }
```

OPTIONALS 3

```
27 <T> void _(final Optional<T> argument) {  
28     argument.map(a -> doSomething(a));  
29 }
```

OPTIONALS 3

```
25 <T> void _(final T argument) {  
26     if (argument != null) {  
27         doSomething(argument);  
28     }  
29 }
```

OPTIONALS 3

```
26 <T> void _(final T argument) {  
27     doSomething(notNull(argument));  
28 }
```

STREAMS 1

```
30  @Test
31  public void _() {
32
33      final Stream<String> stream = elements().stream()
34                                     .sorted();
35
36      final String result = stream.collect(joining(", "));
37
38      assertEquals("A,B,C", result);
39
40  }
41
42  static List<String> elements() {
43      return asList("C", "B", null, "A");
44  }
```

STREAMS 1

```
31  @Test
32  public void _() {
33
34      final Stream<String> stream = elements().stream()
35                                          .filter(Objects::nonNull)
36                                          .sorted();
37
38      final String result = stream.collect(joining(", "));
39
40      assertEquals("A,B,C", result);
41
42  }
43
44  static List<String> elements() {
45      return asList("C", "B", null, "A");
46  }
```

STREAMS 2

```
27 @Test
28 public void _() {
29
30     final long idToFind = 6;
31     final Predicate<Item> idFilter = item -> item.id().equals(idToFind);
32
33     service().itemsMatching(idFilter)
34         .findFirst()
35         .ifPresent(Support::doSomething);
36
37 }
```

STREAMS 2

```
28 @Test
29 public void _() {
30
31     final long idToFind = 6;
32     final Predicate<Item> idFilter = item -> item.id().equals(idToFind);
33
34     service().itemsMatching(idFilter)
35         .reduce(toOneItem())
36         .ifPresent(Support::doSomething);
37
38 }
39
40 BinaryOperator<Item> toOneItem() {
41     return (item, item2) -> {
42         throw new IllegalStateException("Found more than one item with the same id");
43     };
44 }
```


STREAMS 3

```
29 private final UserService userService = new UserService();
30 private final OrderService orderService = new OrderService();
31
32 @Test
33 public void _() {
34     givenALoggedInUser(userService);
35
36     itemsToBuy().stream()
37         .map(item -> new Order(item.id(), currentUser().id()))
38         .forEach(orderService::sendOrder);
39
40     System.out.println(format("Sent %d orders", orderService.sentOrders()));
41 }
42
43 User currentUser() {
44     final User user = userService.currentUser();
45     validate(user != null, "No current user found");
46     return user;
47 }
```

STREAMS 3

```
29 private final UserService userService = new UserService();
30 private final OrderService orderService = new OrderService();
31
32 @Test
33 public void _() {
34     givenALoggedInUser(userService);
35
36     final User user = currentUser();
37     itemsToBuy().parallelStream()
38         .map(item -> new Order(item.id(), user.id()))
39         .forEach(orderService::sendOrder);
40
41     System.out.println(format("Sent %d orders", orderService.sentOrders()));
42 }
43
44 User currentUser() {
45     final User user = userService.currentUser();
46     validState(user != null, "No current user found");
47     return user;
48 }
```

LAMBDA 1

```
28 static Integer numberOfFreeApples(final User user,  
29                                   final Function<User, Integer> foodRatio) {  
30     return 2 * foodRatio.apply(user);  
31 }  
32  
33 @Test  
34 public void _() {  
35  
36     final Function<User, Integer> foodRatioForVisitors = u -> u.age() > 12 ? 2 : 1;  
37  
38     final int numberOfFreeApples = numberOfFreeApples(someUser(), foodRatioForVisitors);  
39  
40     System.out.println(format("Number of free apples: %d", numberOfFreeApples));  
41  
42 }
```

LAMBDA 1

```
29 @Test
30 public void _() {
31
32     final Function<User, Integer> foodRatioForVisitors = u -> u.age() > 12 ? 2 : 1;
33     final Function<User, Integer> age = User::age;
34
35     final int numberOfFreeApples_1 = numberOfFreeApples(someUser(), foodRatioForVisitors);
36     final int numberOfFreeApples_2 = numberOfFreeApples(someUser(), age); // This is a bug!
37
38     System.out.println(format("Number of free apples (1): %d", numberOfFreeApples_1));
39     System.out.println(format("Number of free apples (2): %d", numberOfFreeApples_2));
40
41 }
```

LAMBDA 1

```
28     @FunctionalInterface
29     interface FoodRatioStrategy {
30
31         Integer ratioFor(User user);
32     }
33
34     static Integer numberOfFreeApples(final User user,
35                                     final FoodRatioStrategy ratioStrategy) {
36         return 2 * ratioStrategy.ratioFor(user);
37     }
38
39     @Test
40     public void _() {
41
42         final FoodRatioStrategy foodRatioForVisitors = user -> user.age() > 12 ? 2 : 1;
43         final Function<User, Integer> age = User::age;
44
45         final Integer numberOfFreeApples_1 = numberOfFreeApples(someUser(), foodRatioForVisitors);
46         //final Integer numberOfFreeApples_2 = numberOfFreeApples(someUser(), age);
47
48         System.out.println(format("Number of free apples (1): %d", numberOfFreeApples_1));
49     }
```

LAMBDA 2

```
25 @Test
26 public void should_build_tesla() {
27
28     assertEquals(1000, new TeslaFactory().createTesla().engine().horsepower());
29
30 }
31
32 @Test
33 public void should_build_volvo() {
34
35     assertEquals(250, new VolvoFactory().createVolvo().engine().horsepower());
36
37 }
```

LAMBDA 3

```
29 @Test
30 public void _() {
31
32     final List<Integer> values = asList(1, 2, 3, 4, 5, 6, 7, 8, 9, 10);
33
34     allEvenNumbers(values);
35
36     System.out.println("Hello");
37
38 }
39
40 static List<Integer> allEvenNumbers(final List<Integer> values) {
41     return values.stream()
42         .filter(Support::isEven)
43         .collect(toList());
44 }
```

LAMBDA 3

```
31 @Test
32 public void _() {
33
34     final List<Integer> values = asList(1, 2, 3, 4, 5, 6, 7, 8, 9, 10);
35
36     final Supplier<List<Integer>> integers = () -> allEvenNumbers(values);
37
38     System.out.println(integers.get());
39
40 }
41
42 static List<Integer> allEvenNumbers(final List<Integer> values) {
43     return values.stream()
44         .filter(Support::isEven)
45         .collect(toList());
46 }
```


LAMBDA 4

```
24 private final String pattern;
25
26 public _14(final String pattern) {
27     this.pattern = pattern;
28 }
29
30 public List<String> allMatchingElements(final List<String> elements) {
31     return elements.stream()
32         .filter(e -> e.contains(pattern))
33         .collect(toList());
34 }
```

LAMBDA 4

```
25 private final String pattern;
26
27 public _14(final String pattern) {
28     this.pattern = pattern;
29 }
30
31 public List<String> allMatchingElements(final List<String> elements) {
32     return elements.stream()
33         .filter(matches(pattern))
34         .collect(toList());
35 }
36
37 private Predicate<String> matches(final String pattern) {
38     return e -> e.contains(pattern);
39 }
```

Q & A



[Questions]

Code examples can be found here:

<https://github.com/sawano/beyond-lambdas-the-aftermath>

Thank you!

@DanielSawano @DanielDeogun