Automated Refactoring for Scala

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Scala Refactoring Project

Project Goal
Creating an IDE independent refactoring library that makes creating new refactorings as simple as possible.
1 Refactoring
   • A Refactoring Example
   • Refactorings for Scala

2 The Project
   • Architecture Overview
   • Implemented Refactorings

3 Demo

4 Outlook
What is Refactoring?

Refactorings are

*program restructuring operations that support the design, evolution and reuse of object-oriented application frameworks.*

[Opd92]
What is **Automated** Refactoring?
An Example: Extract Method in Scala

def sendNotification() {
  val connection = openSmtpConnection()
  val emailMessage = createMessage()
  val status = connection send emailMessage
}

An Example: Extract Method in Scala

```scala
def sendAnEmail(connection: Connection) = {
    val emailMessage = createMessage()
    connection send emailMessage
}

def sendNotification() {
    val connection = openConnection()
    val status = sendAnEmail(connection)
}
```
def sendAnEmail(send: Message => Status) = {
  val emailMessage = createMessage()
  send(emailMessage)
}
def sendNotification() {
  val connection = openConnection()
  val status = sendAnEmail(connection.send)
}
Refactorings from Java

Most used refactorings in Eclipse JDT are:

- Rename
- Extract Local Variable
- Move
- Extract Method
Scala Specific

Traits

- Split
- Rename
- Extract

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Scala Specific

### Traits
- Split
- Rename
- Extract

### Pattern Matching
- Convert Conditionals
- Convert Instance Checks
- Introduce Extractor
Scala Specific

Traits
- Split
- Rename
- Extract

Pattern Matching
- Convert Conditionals
- Convert Instance Checks
- Introduce Extractor

and many more ...
Automated Refactoring for Scala

Scala Refactoring Project
Architecture Overview

IDE / Tool

Refactoring Library
  - Implementations

Core
  - Analysis
  - Transformation
  - Code Generation

Scalac

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Automated Refactoring for Scala
Architecture Overview

IDE / Tool

Refactoring Library

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Scala
Implemented Refactorings

- Rename
- Organize Imports
- Extract Method
- Extract Local
Demo
Next Steps

- Scala IDE Integration
- Stabilizing the Library
- More Refactorings
University of Applied Sciences Rapperswil

INSTITUTE FOR SOFTWARE

- scala.ifs.hsr.ch
- misto.ch
- twitter.com/m_st
William F. Opdyke. 
Refactoring Object-Oriented Frameworks. 

Martin Fowler. 
Refactoring: improving the design of existing code. 