

Wissenschaftliche Software pflegen – aber wie?

Andreas Zeller
Universität des Saarlandes

Ein Forscher



Professor **Andreas Hildebrandt**
Universität Mainz

Ein Forscher

Ein Programmierer



Professor **Andreas Hildebrandt**
Universität Mainz

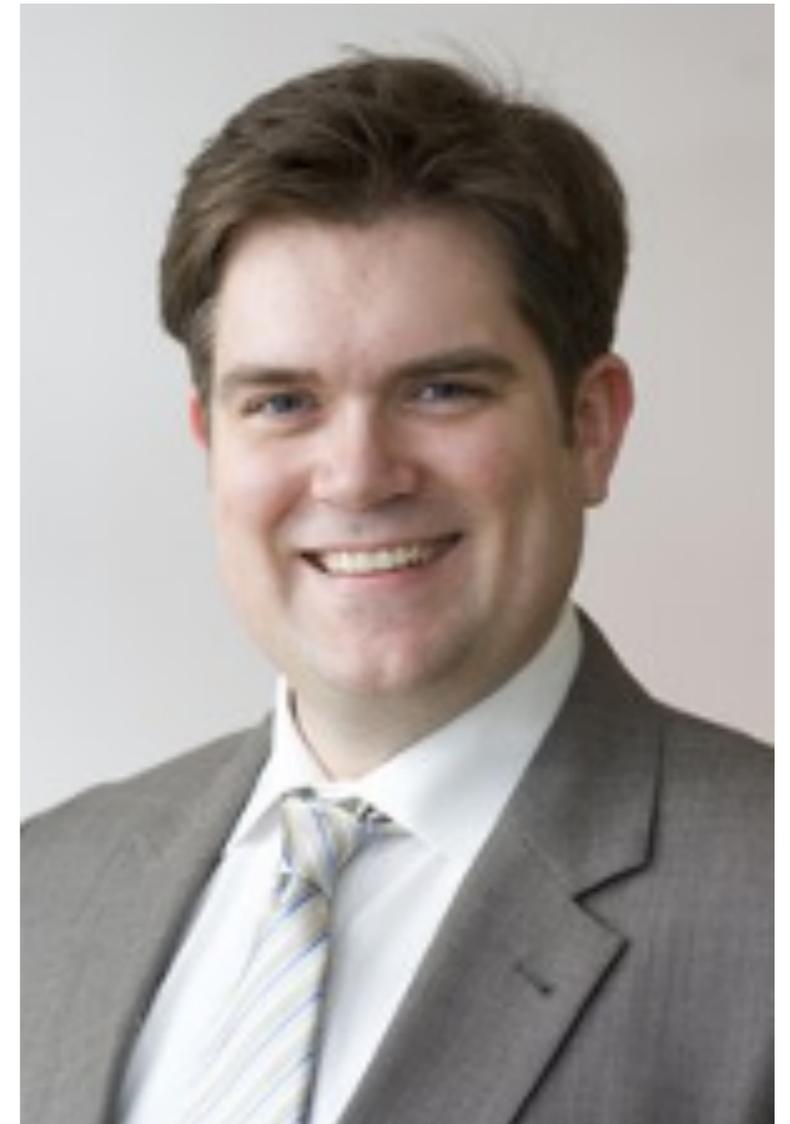
Ein Forscher

Ein Programmierer

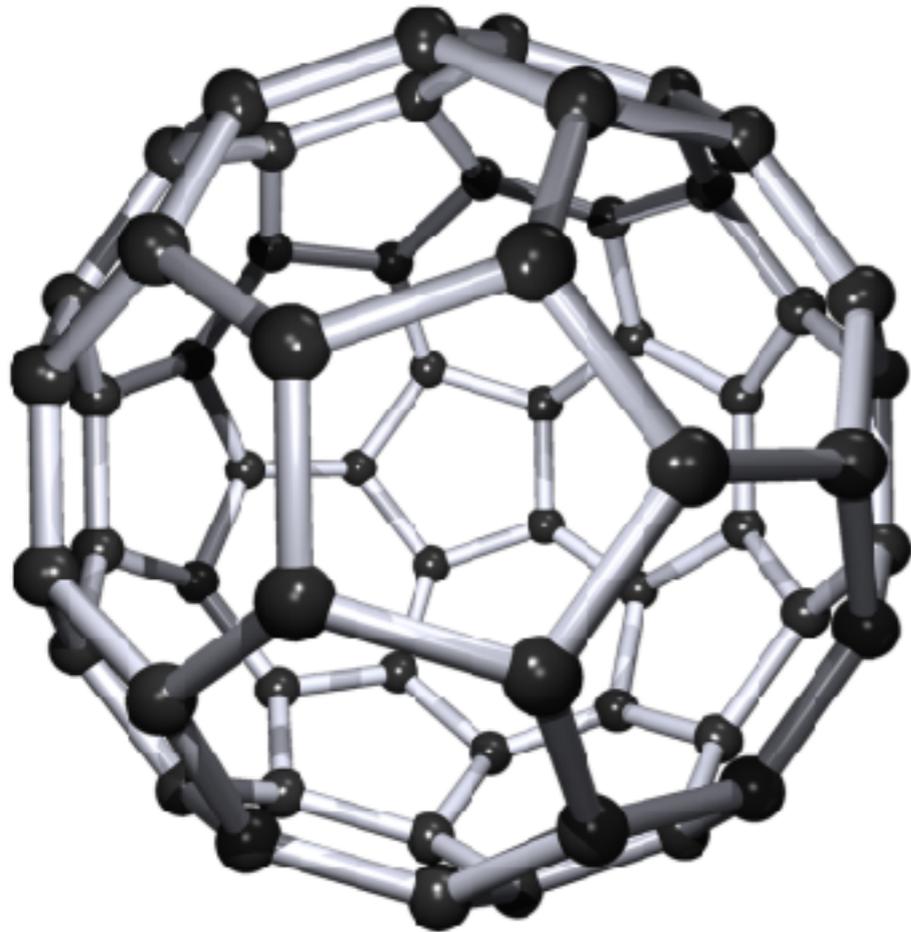


Professor **Andreas Hildebrandt**
Universität Mainz

Ein Instandhalter



Die BALL-Bibliothek



BALL Biochemical
algorithms library

- liefert Algorithmen der Bioinformatik
- >700,000 Code-Zeilen
- Viele Hundert Benutzer
- Stetige Anpassung des Codes an aktuelle Compiler + Plattformen
- Fehlerberichte, Integration, Reparaturen

Der Instandhalter



Professor **Andreas Hildebrandt**
Universität Mainz

- BALL gibt es seit 1996;
open source seit 2000
- BALL wird heute noch von
Professor + Doktoranden
weiter gepflegt
- Wie organisieren die das?

Urheberrechtlich geschütztes Material

Helmut Balzert

Lehrbuch der Softwaretechnik

Entwurf, Implementierung, Installation und Betrieb

3. Auflage

Lehrbücher der Informatik

Spektrum
AKADEMISCHER VERLAG

Urheberrechtlich geschütztes Material

*“The most important book about technology today,
with implications that go far beyond programming.”*

—Guy Kawasaki

THE CATHEDRAL & THE BAZAAR

**MUSINGS ON LINUX AND OPEN SOURCE
BY AN ACCIDENTAL REVOLUTIONARY**

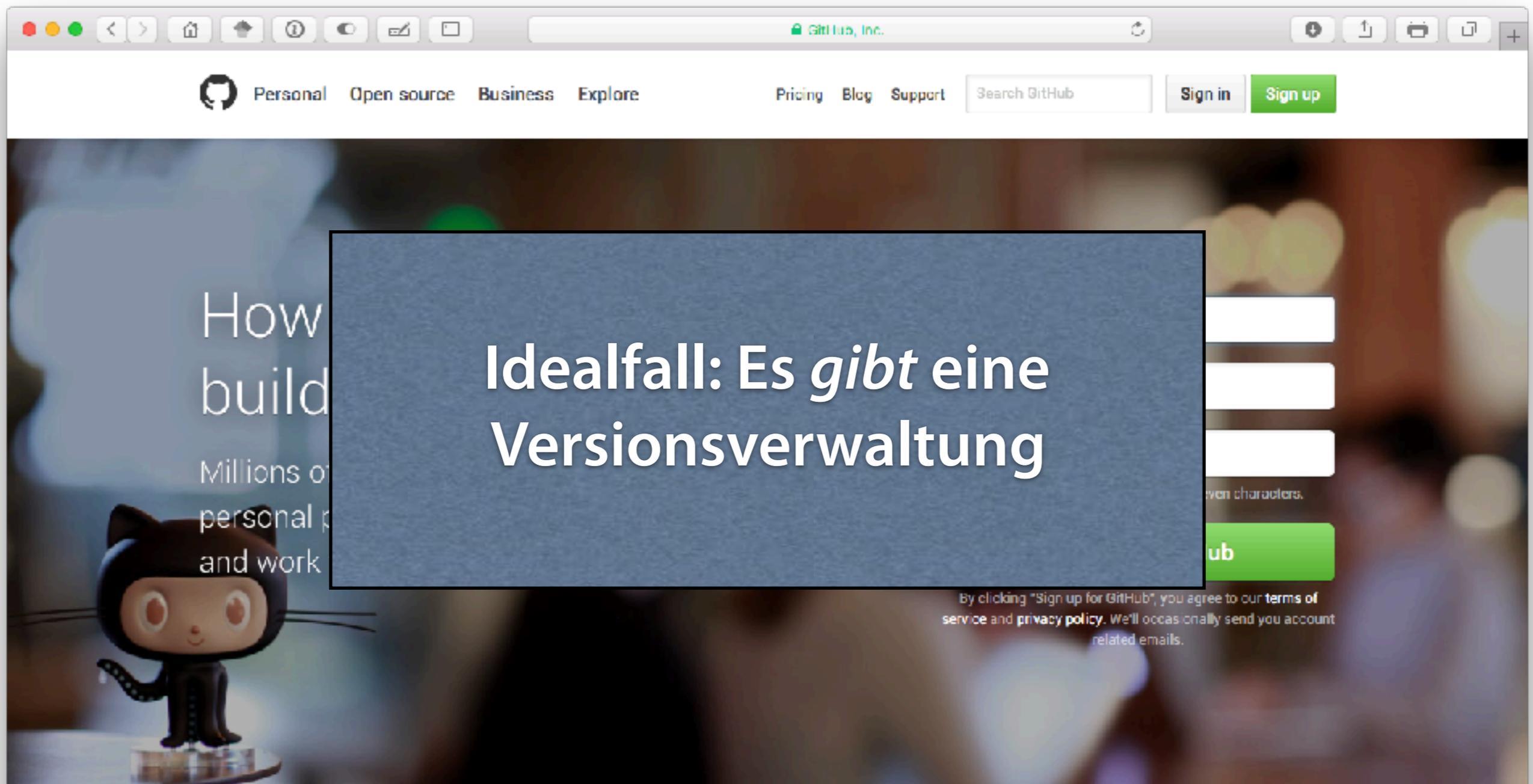


ERIC S. RAYMOND

WITH A FOREWORD BY BOB YOUNG, CHAIRMAN & CEO OF RED HAT, INC.

Versionsverwaltung

ermöglicht beliebig vielen Nutzern, sich zu beteiligen



The image shows a screenshot of the GitHub homepage. The browser's address bar displays "GitHub, Inc.". The navigation menu includes "Personal", "Open source", "Business", "Explore", "Pricing", "Blog", and "Support". There is a search bar labeled "Search GitHub" and buttons for "Sign in" and "Sign up". The main content area features a dark background with a GitHub Octocat mascot on the left. A semi-transparent blue box is overlaid on the page, containing the text "Idealfall: Es gibt eine Versionsverwaltung". To the right of the box, there are input fields for a sign-up form, including a password field with a "seven characters" hint and a green "Sign up" button. At the bottom right, there is a small disclaimer: "By clicking 'Sign up for GitHub', you agree to our terms of service and privacy policy. We'll occasionally send you account related emails."

Personal Open source Business Explore Pricing Blog Support Search GitHub Sign in Sign up

How build Millions of personal p and work

Idealfall: Es *gibt* eine Versionsverwaltung

seven characters. Sign up

By clicking "Sign up for GitHub", you agree to our terms of service and privacy policy. We'll occasionally send you account related emails.

Konstruktion

Jede/r kann das Produkt aus dem Quelltext bauen



The image shows a screenshot of the Apache Maven Project website. The browser address bar displays 'maven.apache.org'. The page header includes the Apache Maven Project logo and the 'Maven' logo. A navigation menu on the left lists various sections like 'Welcome', 'License', 'Download', 'Install', 'Configure', 'Run', and 'IDE Integration'. The main content area features a large blue text box with the text 'Idealfall: Automatisch von Rohdaten zum Paper'. Below this, there is a list of bullet points under the heading 'Making the build process easy', which includes items like 'Making the build process easy', 'Providing a uniform build system', and 'Providing quality project information'. The page also shows a breadcrumb trail 'Apache / Maven / Introduction' and a 'Last Published: 2016-11-17' date.

Apache Maven Project
http://maven.apache.org/

Maven™

Apache / Maven / Introduction

Last Published: 2016-11-17

MAIN

- Welcome
- License
- Download
- Install
- Configure
- Run
- IDE Integration

ABOUT MAVEN

- What is Maven?
- Features
- FAQ
- Support and Training

DOCUMENTATION

- Maven Plugins
- Index (category)
- Running Maven

Int

Mave
There
build

The
day v

Ma

Mave
there

esses in the Jakarta Turbine project.
VS. We wanted a standard way to
to share JARs across several projects.
something that will make the day-to-
od of time. In order to attain this goal

Idealfall: Automatisch von Rohdaten zum Paper

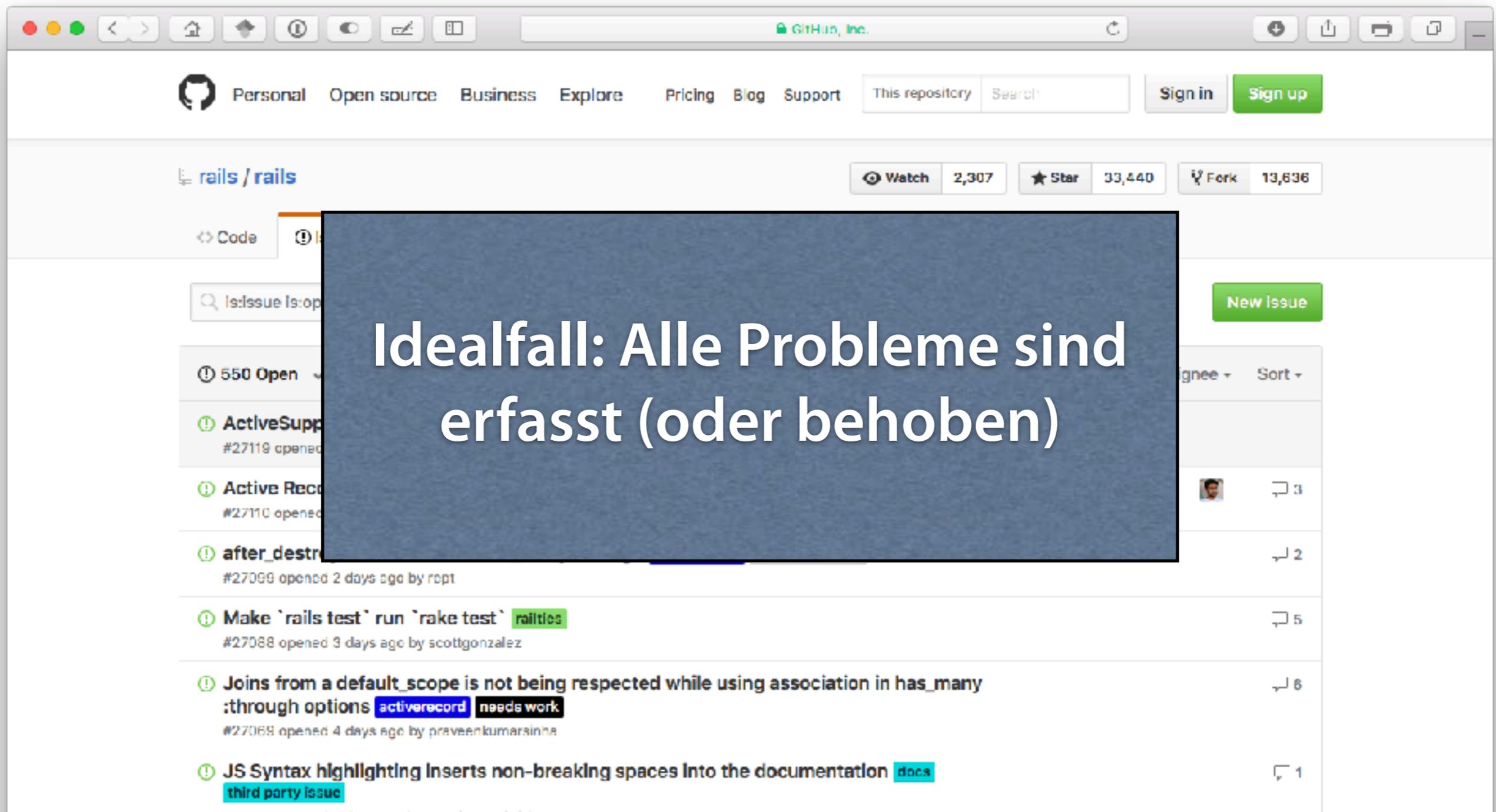
- Making the build process easy
- Providing a uniform build system
- Providing quality project information
- Providing guidelines for best practices development
- Allowing transparent migration to new features

Making the build process easy

While using Maven doesn't eliminate the need to know about the underlying mechanisms, Maven does provide a lot of shielding from the details.

Bug Tracking

Organisiert Arbeit anhand von Nutzer-Meldungen



The image shows a screenshot of the GitHub web interface for the Rails repository. The browser's address bar shows 'GitHub, Inc.'. The navigation bar includes links for 'Personal', 'Open source', 'Business', 'Explore', 'Pricing', 'Blog', and 'Support', along with a search bar and 'Sign in' and 'Sign up' buttons. The repository name 'rails / rails' is displayed, with statistics for 'Watch' (2,307), 'Star' (33,440), and 'Fork' (13,636). A 'New Issue' button is visible on the right. The main content area shows a list of open issues. A large, semi-transparent blue box with white text is overlaid in the center, stating: 'Idealfall: Alle Probleme sind erfasst (oder behoben)'. Below this box, several issue titles are visible, including 'ActiveSupp #27119 opened', 'Active Recd #27110 opened', 'after_destro #27099 opened 2 days ago by rept', 'Make `rails test` run `rake test` railsies #27088 opened 3 days ago by scottgonzalez', 'Joins from a default_scope is not being respected while using association in has_many :through options activerecord needs work #27069 opened 4 days ago by praveenkumarsinha', and 'JS Syntax highlighting Inserts non-breaking spaces into the documentation docs third party issue #27068 opened 4 days ago by praveenkumarsinha'.

GitHub, Inc.

Personal Open source Business Explore Pricing Blog Support This repository Search Sign in Sign up

rails / rails Watch 2,307 Star 33,440 Fork 13,636

Code

Issue Is:op

New Issue

550 Open

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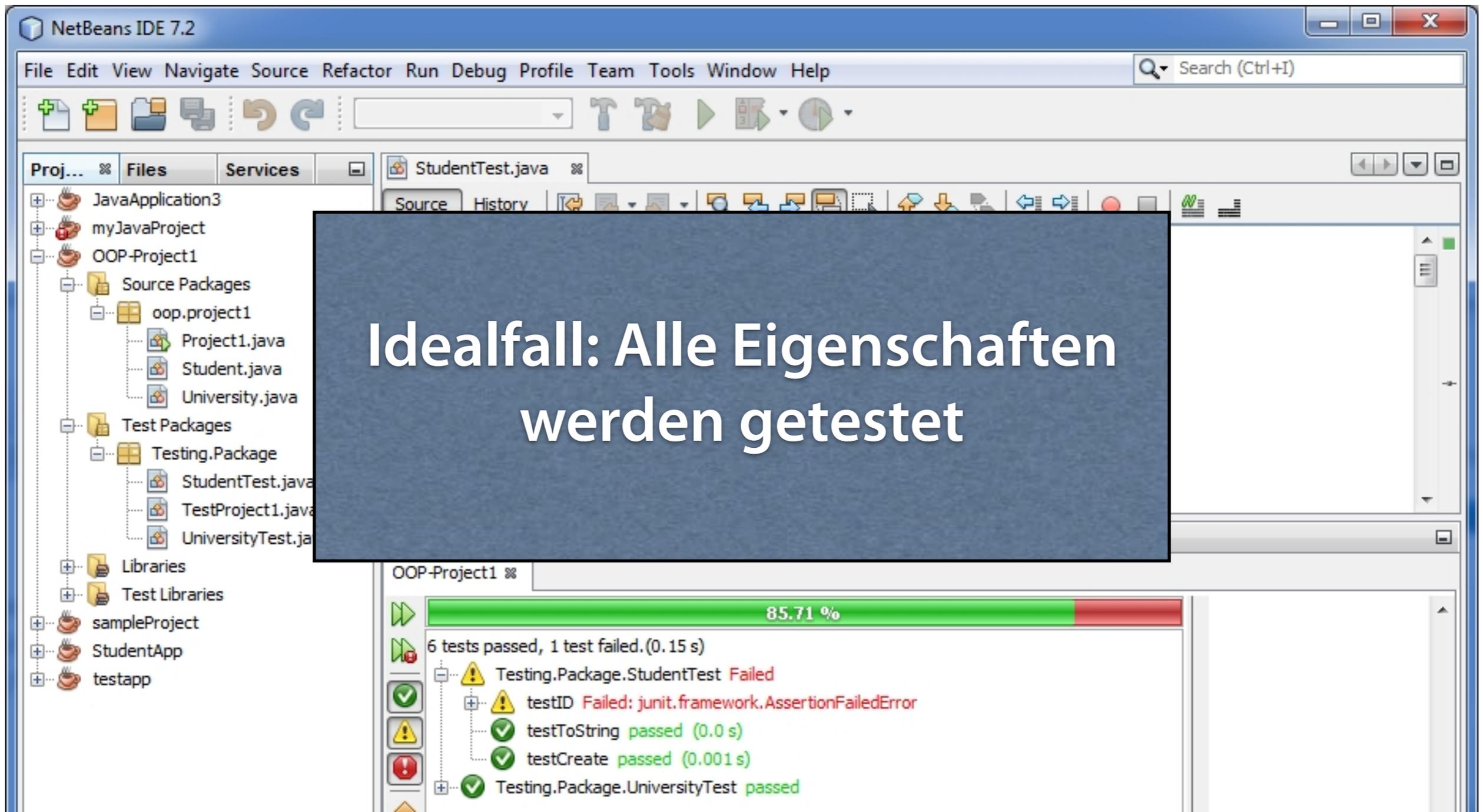
Joins from a default_scope is not being respected while using association in has_many :through options activerecord needs work #27069 opened 4 days ago by praveenkumarsinha

JS Syntax highlighting Inserts non-breaking spaces into the documentation docs third party issue #27068 opened 4 days ago by praveenkumarsinha

Idealfall: Alle Probleme sind erfasst (oder behoben)

Automatische Tests

prüfen und sichern Qualität auf Knopfdruck



The screenshot shows the NetBeans IDE 7.2 interface. The left sidebar displays a project tree for 'myJavaProject' with sub-packages 'Source Packages' and 'Test Packages'. The 'Test Packages' section shows 'Testing.Package' containing 'StudentTest.java', 'TestProject1.java', and 'UniversityTest.java'. The bottom right pane shows the test results for 'OOP-Project1' with a progress bar at 85.71%. The results indicate that 6 tests passed and 1 test failed. The failed test is 'testID' in 'Testing.Package.StudentTest', which failed with a 'junit.framework.AssertionFailedError'. Other tests like 'testToString', 'testCreate', and 'Testing.Package.UniversityTest' all passed.

Idealfall: Alle Eigenschaften werden getestet

NetBeans IDE 7.2

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Search (Ctrl+I)

Proj... Files Services StudentTest.java

Source History

JavaApplication3
myJavaProject
OOP-Project1
Source Packages
oop.project1
Project1.java
Student.java
University.java
Test Packages
Testing.Package
StudentTest.java
TestProject1.java
UniversityTest.java
Libraries
Test Libraries
sampleProject
StudentApp
testapp

OOP-Project1

85.71 %

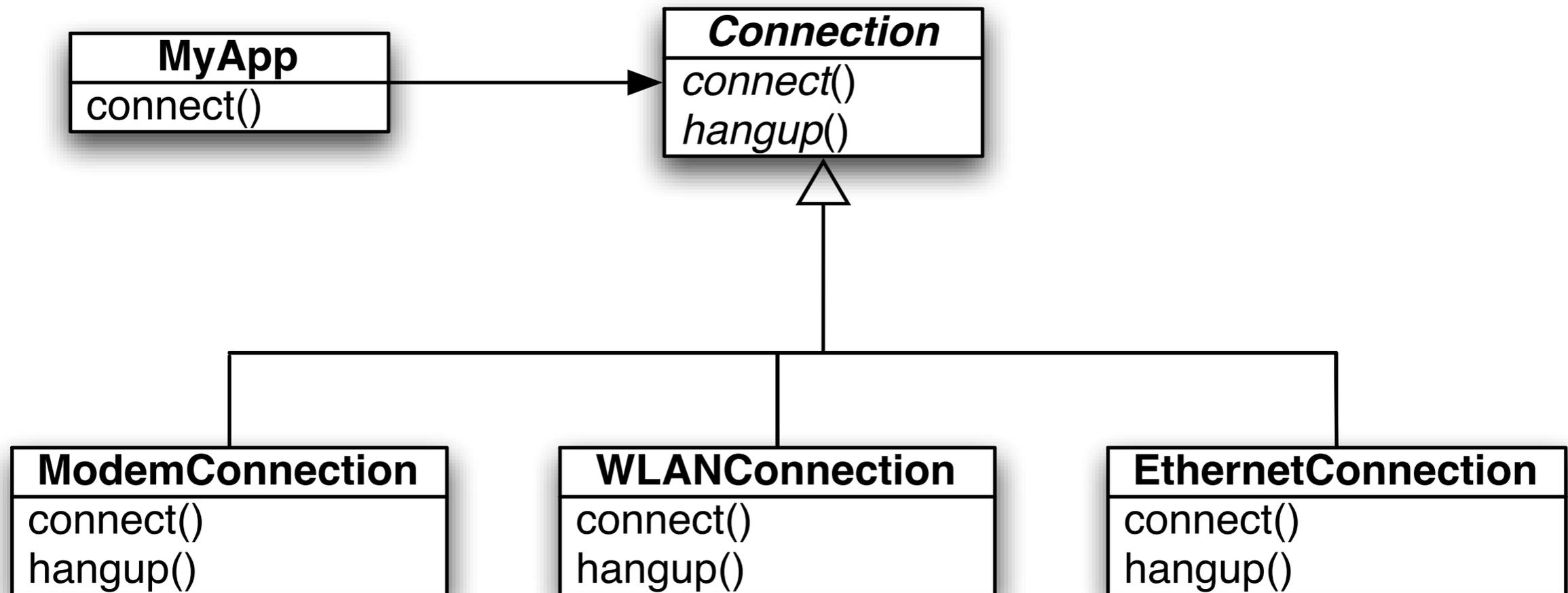
6 tests passed, 1 test failed. (0.15 s)

- Testing.Package.StudentTest Failed
 - testID Failed: junit.framework.AssertionFailedError
 - testToString passed (0.0 s)
 - testCreate passed (0.001 s)
- Testing.Package.UniversityTest passed

Open/Close-Prinzip

```
void connect() {  
    if (connection_type == MODEM_56K)  
    {  
        Modem modem = new Modem();  
        modem.connect();  
    }  
    else if (connection_type == ETHERNET) ...  
    else if (connection_type == WLAN) ...  
    else if (connection_type == UMTS) ...  
}
```

Open/Close-Prinzip



System sollte *offen* für Erweiterungen,
aber *geschlossen* für Änderungen sein

Der Instandhalter

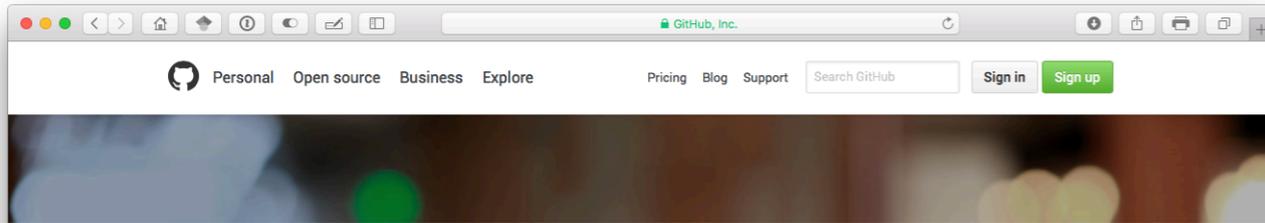


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- **Jede/r** kann BALL weiterentwickeln + erweitern
- **Jede/r** kann Benutzer unterstützen
- **Jede/r** kann die Qualität sicherstellen
- kostengünstig – aber nicht kostenlos

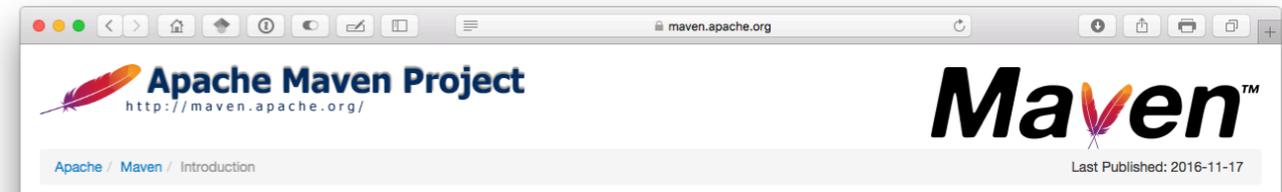
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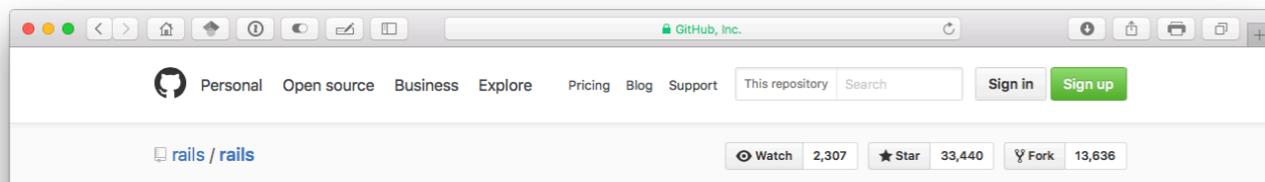
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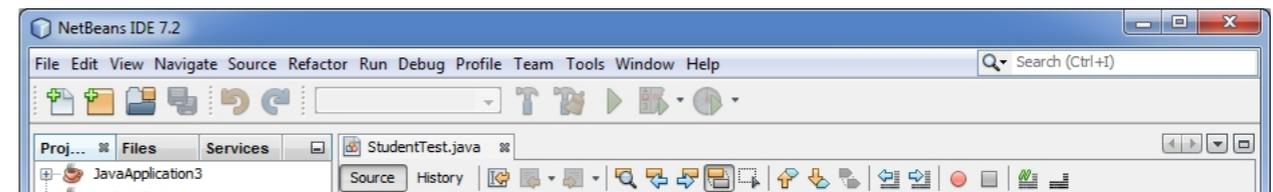
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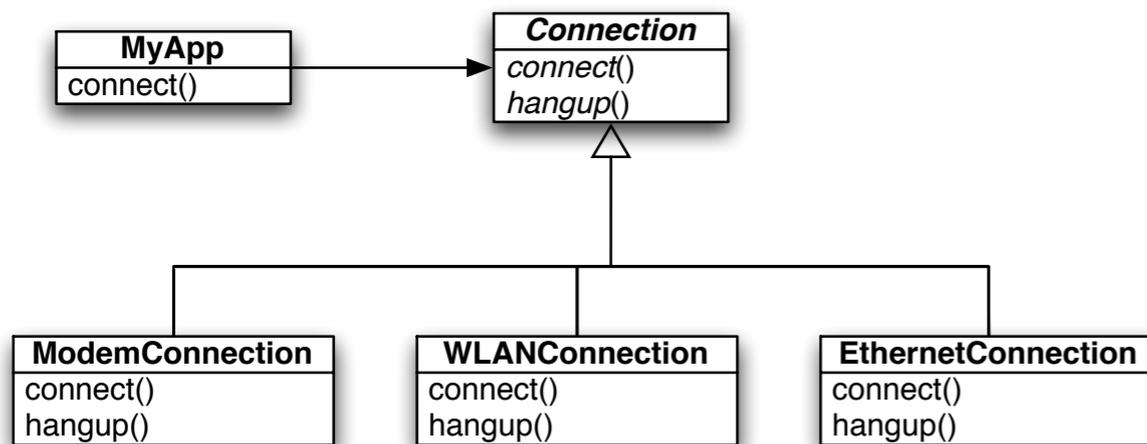


Automatische Tests

prüfen und sichern Qualität auf Knopfdruck



Open/Close-Prinzip



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aber *geschlossen* für Änderungen sein

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