



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

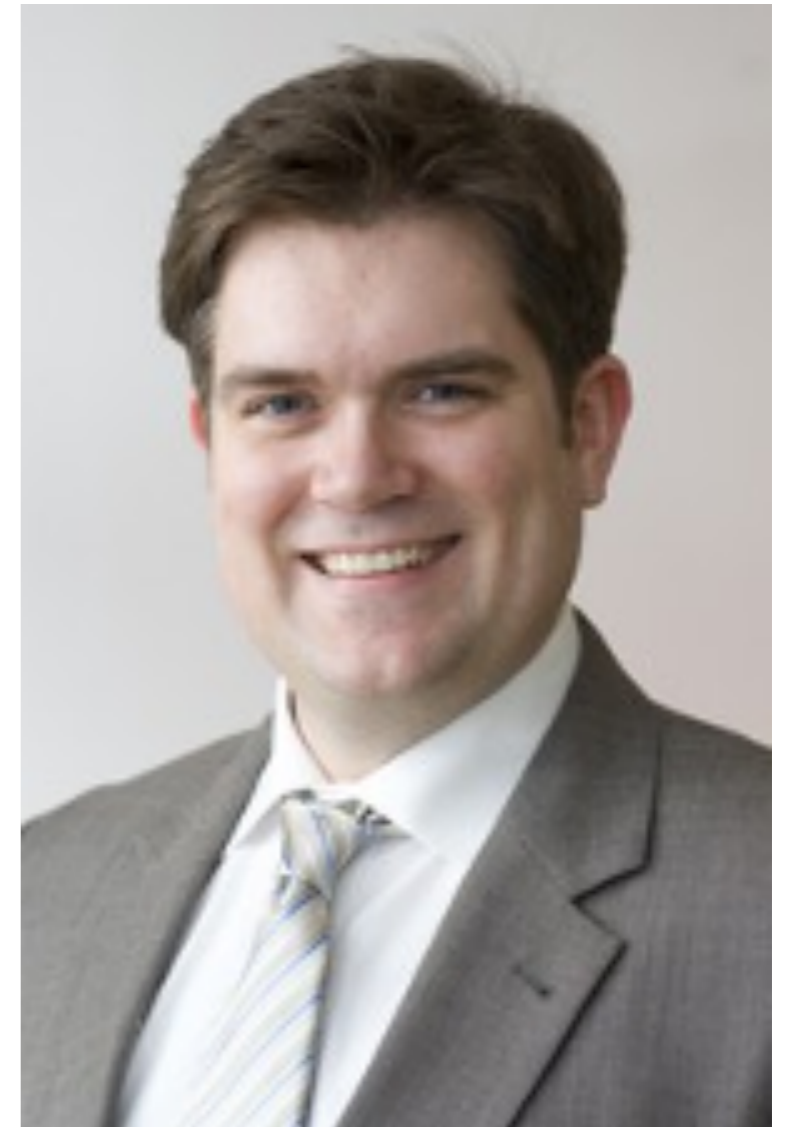
Ein Forscher

Ein Programmierer

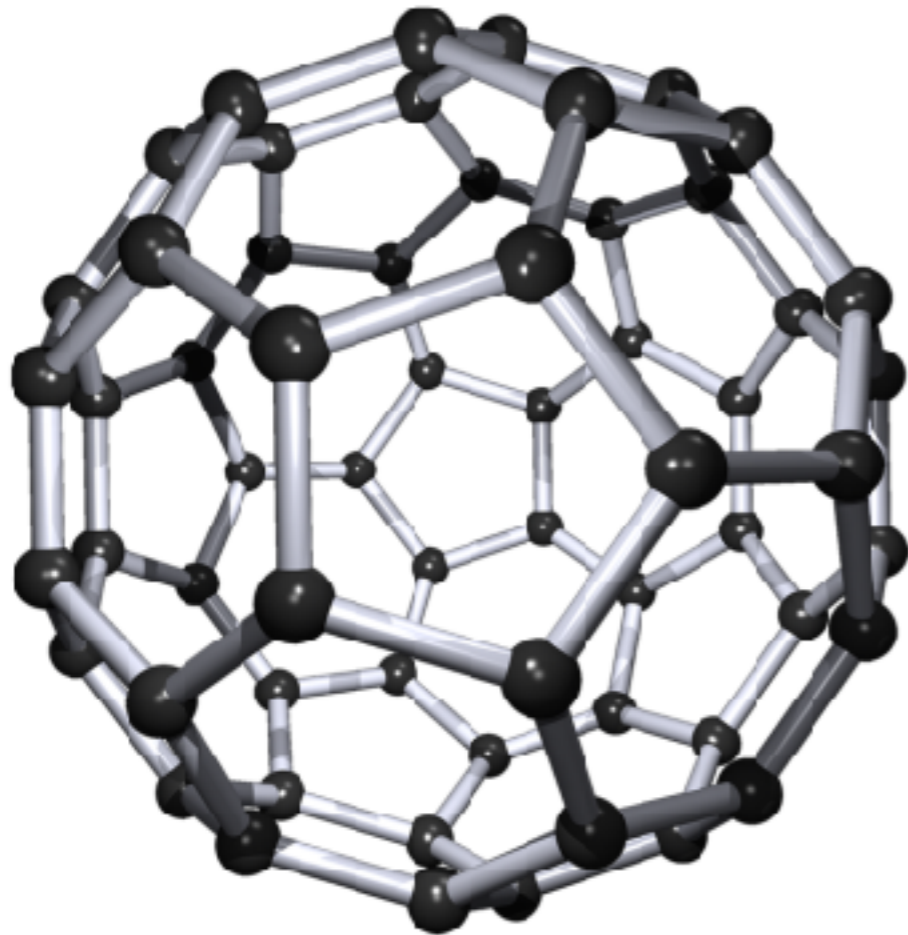


Professor **Andreas Hildebrandt**
Universität Mainz

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

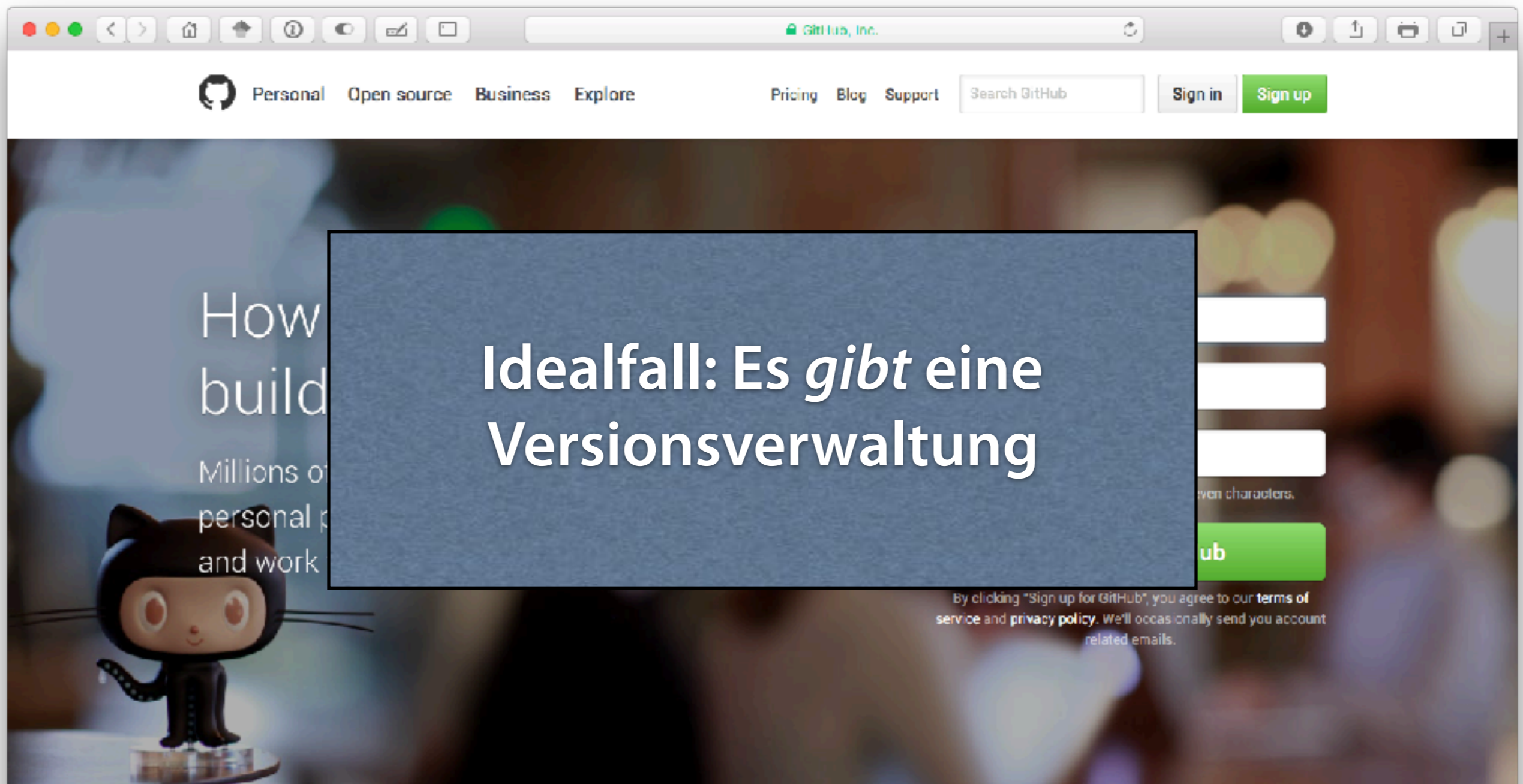


ERIC S. RAYMOND

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 blurred image of a crowd and a GitHub Octocat figurine in the bottom left corner. A semi-transparent blue box is overlaid on the page, containing the text "Idealfall: Es gibt eine Versionsverwaltung".

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

even characters.
ub

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, the text 'Making the build process easy' is visible, followed by a list of bullet points: 'Making the build process easy', 'Providing a uniform build system', 'Providing quality project information', 'Providing guidelines for best practices development', and 'Allowing transparent migration to new features'.

Apache / Maven / Introduction

Last Published: 2016-11-17

What is Maven?

Making the build process easy

- 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

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

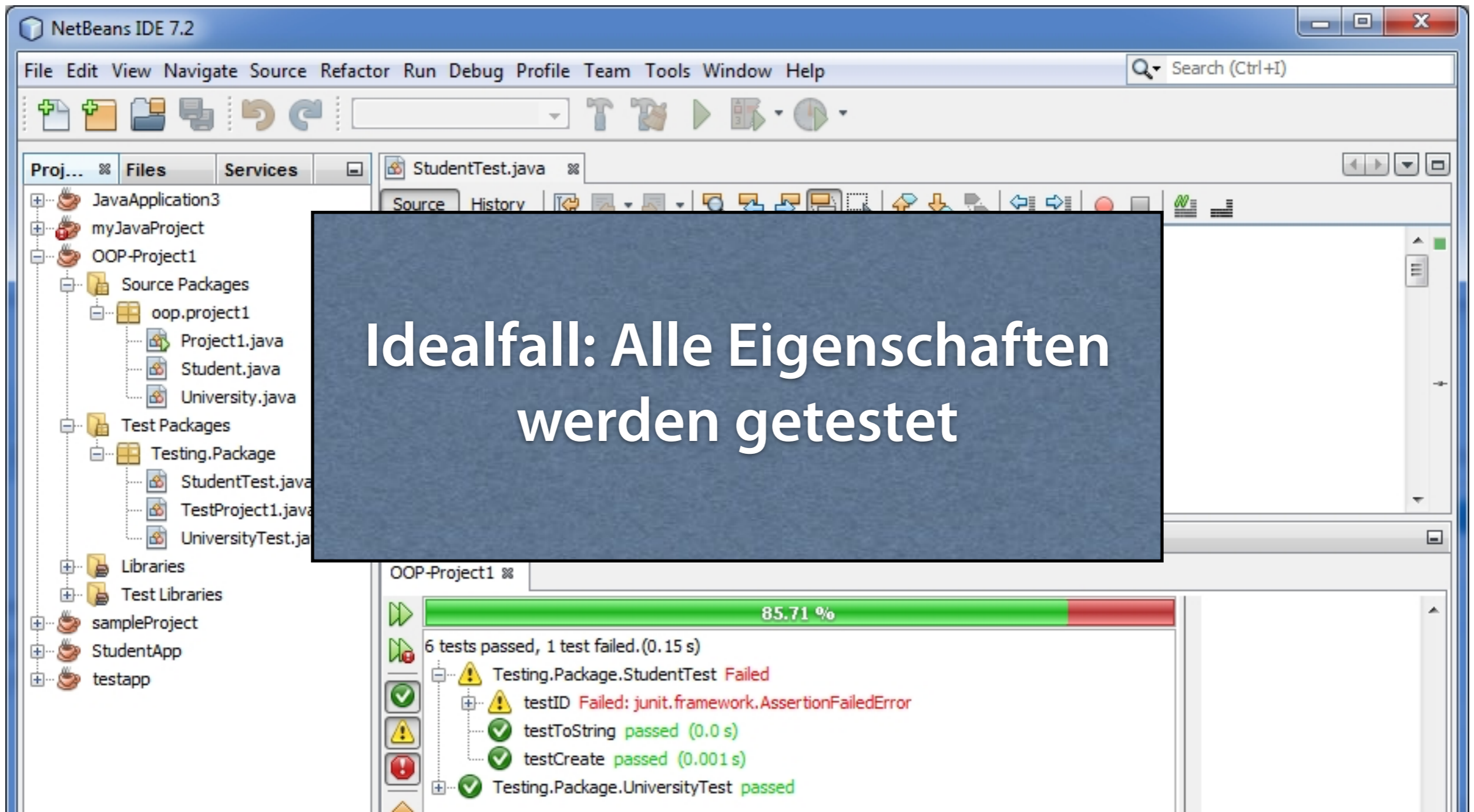
Organisiert Arbeit anhand von Nutzer-Meldungen

The image shows a screenshot of a web browser displaying the GitHub repository page for 'rails / rails'. The browser's address bar shows 'GitHub, Inc.'. The page header includes navigation links like 'Personal', 'Open source', 'Business', 'Explore', 'Pricing', 'Blog', and 'Support', along with a search bar and 'Sign in'/'Sign up' buttons. Below the header, the repository name 'rails / rails' is shown, followed by statistics: 'Watch 2,307', 'Star 33,440', and 'Fork 13,636'. A 'New Issue' button is visible on the right. The main content area displays a list of issues. A large, semi-transparent blue text box is overlaid on the center of the page, containing the text: 'Idealfall: Alle Probleme sind erfasst (oder behoben)'. The visible issues in the background include:

- 550 Open
- ActiveSupport #27119 opened
- Active Record #27110 opened
- after_destroy #27099 opened 2 days ago by rept
- Make `rails test` run `rake test` **railties** #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
- JS Syntax highlighting inserts non-breaking spaces into the documentation **docs** **third party issue**

Automatische Tests

prüfen und sichern Qualität auf Knopfdruck



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

Idealfall: Alle Eigenschaften werden getestet

OOP-Project1 85.71 %

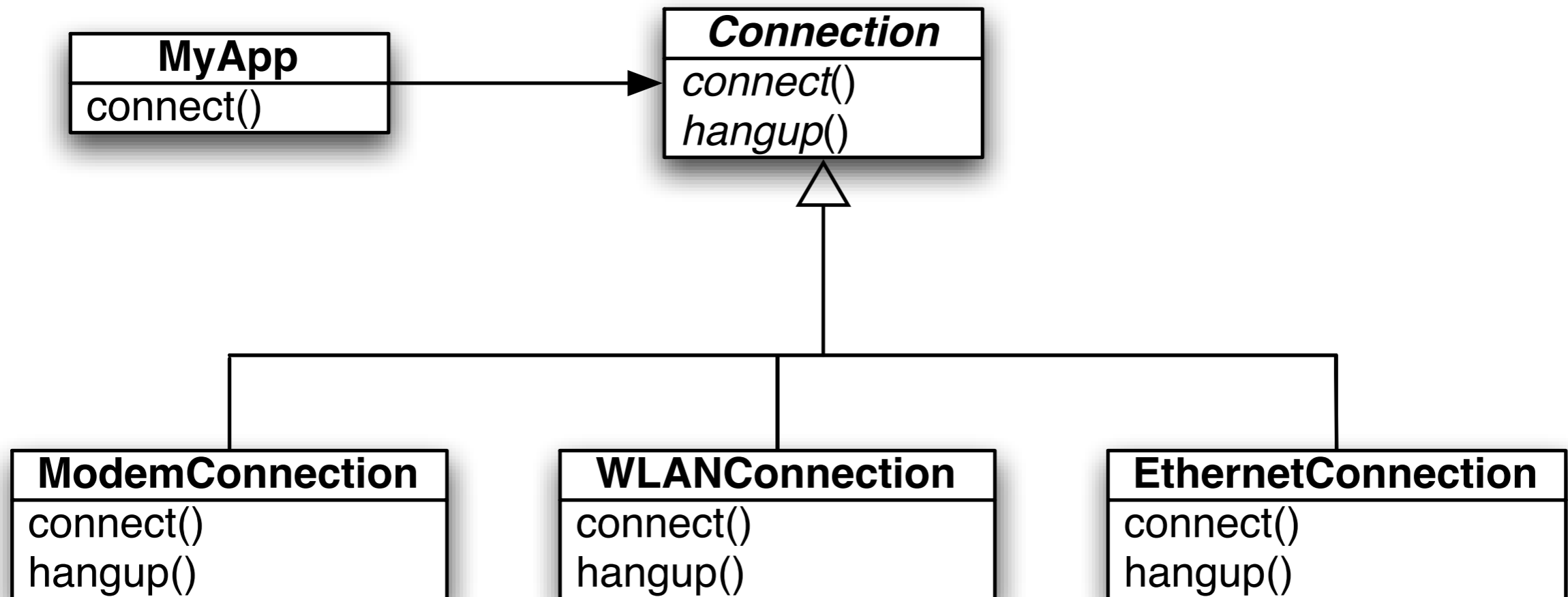
6 tests passed, 1 test failed. (0.15 s)

- 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

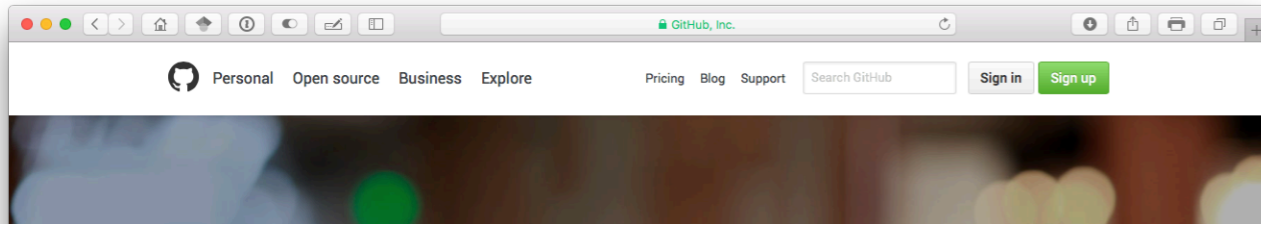


Professor **Andreas Hildebrandt**
Universität Mainz

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

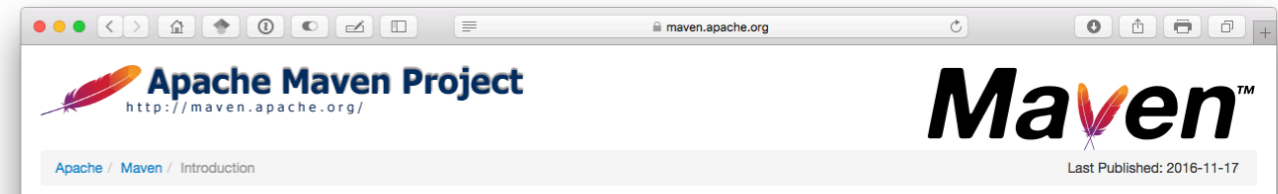
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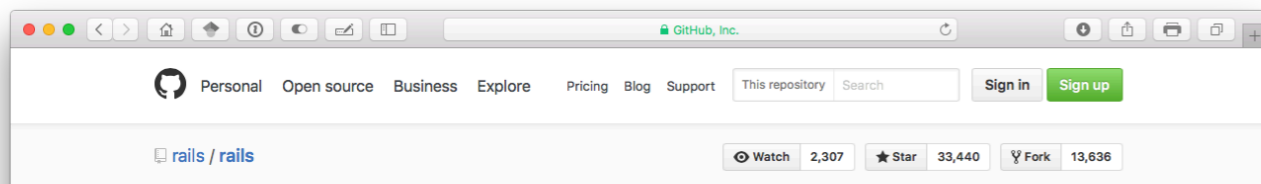
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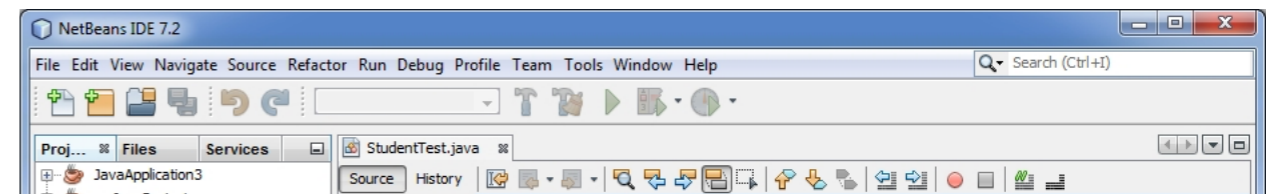
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Organisiert Arbeit anhand von Nutzer-Meldungen

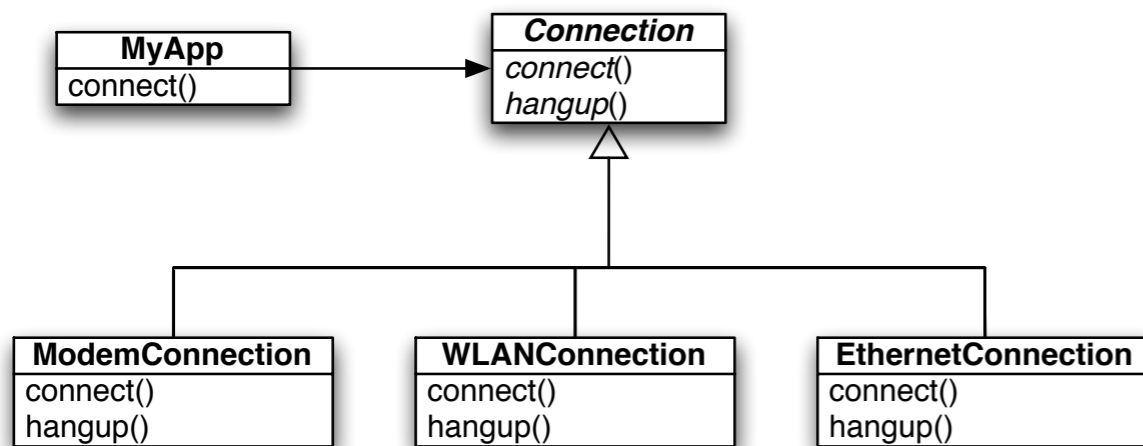


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prüfen und sichern Qualität auf Knopfdruck



Open/Close-Prinzip



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aber *geschlossen* für Änderungen sein

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