

Software-Engineering und Software Qualität

Softwareprozesse – Teil 2

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Inhalte



- Vorgehensmodelle
- Prozessaktivitäten
- Umgang mit Änderungen
- Rational Unified Process

Hauptaktivitäten



- Softwarespezifikation
- Softwareentwicklung
- Softwareverifikation/-validierung
- Softwareevolution

CASE-Werkzeuge



- CASE Computer Aided Software Engineering
 - Unterstützen Software-Engineering
 - Beispiele: Entwurfseditoren, Compiler, Debugger,
 Werkzeuge, um Prozessaktivitäten zu automatisieren (kombiniert mit IDE)
 - Automatisierung z.B.
 - Codeerzeugung aus grafischen Modellen
 - Erzeugung von Benutzeroberflächen aus einem grafischen Modell, die der Benutzer entwirft
 - Verwaltung von Fehlern

IDE - Testautomatisierung



Karma Coverage



Coverage report produces HTML files -> inspect in browser

```
98 ▲ 37 ▲ 1 ∧
coverage
                                                             <!doctype html>

✓ ☐ my-app

                                                             <html lang="en">
    v app
      > admin
                                                             <head>
                                                                                                                                           All files / app app.component.ts
      > Child
                                                                 <title>Code coverage report for app/app.component.ts</title>
                                                                                                                                           28.57% Statements 2/7 100% Branches e/e 0% Functions e/1 16.66% Lines 1/6
                                                                 <meta charset="utf-8" />
      > mat-form
                                                                 <link rel="stylesheet" href="../prettify.css" />
                                                                                                                                           Press n or j to go to the next uncovered block, b, p or k for the previous block.
                                                                 <link rel="stylesheet" href="../base.css" />
      > my-component
                                                                 k rel="shortcut icon" type="image/x-icon" href="../favicon.png" />
       > parent
                                                                 <meta name="viewport" content="width=device-width, initial-scale=1" />
       > reactive-form
                                                                                                                                                   import { Component } from '@angular/core';
                                                                 <style type='text/css'>
                                                                                                                                                   import {AppModule} from './app.module';
                                                                     .coverage-summary .sorter {
       > special
                                                                         background-image: url(../sort-arrow-sprite.png);
                                                                                                                                                    selector: 'app-root',
       > iii toolbar
                                                                                                                                                    standalone: false,
       > user-detail
                                                                                                                                                     templateUrl: './app.component.html',
                                                                 </style>
                                                                                                                                                     styleUrl: './app.component.scss'
         app.component.ts.html
                                                             </head>
         auth.interceptor.ts.html
                                                                                                                                            10 1x export class AppComponent {
                                                      18
                                                                                                                                                    title = 'mv-app':
         <> index.html
                                                             <body>
                                                                                                                                                                                       Hints what is
         my-service.service.ts.html
                                                                                                                                                     name: string = "";
                                                             <div class='wrapper'>
         security-guard.guard.ts.html
                                                                                                                                                     userName: string = "";
                                                                     <h1><a href="../index.html">All files</a> / <a href="index.html">app</a>
                                                                                                                                                                                       untested / unreached code
       base.css
                                                                     <div class='clearfix'>
                                                                                                                                                     userInput = {
       Js block-navigation.js
                                                                                                                                            18
                                                                                                                                                      name: "Please enter your name",
       s favicon.png
                                                                                                                                                                                       or tested too often
                                                                         <div class='fl padly space-right2'>
       <> index.html
                                                                                                                                           21
                                                                                                                                                    onChanges() {
                                                                             <span class="strong">28.57% </span>
       prettify.css
                                                                                                                                                    console.log(this.userName)
                                                                             <span class="quiet">Statements</span>
                                                                                                                                           23
       on prettify.js
                                                                             <span class='fraction'>2/7</span>
                                                                                                                                           24
       sort-arrow-sprite.png
                                                                                                                                           25
                                                                         </div>
       sorter.js
```



Prof. Dr. Cathrin Möller - Angewandte Informatik

SE und SQ 28.04.2025 5

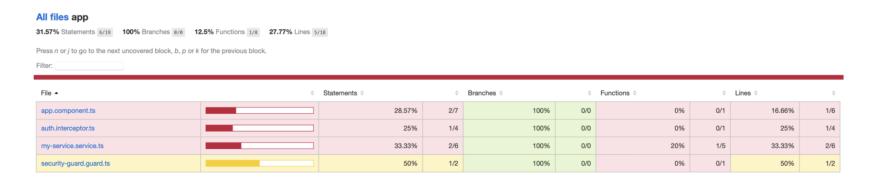
IDE - Testautomatisierung



Karma Coverage



Visiting coverage/index.html allows to navigate through folders and files = components



- => indication what component is least tested
- => starting point to add unit tests
- => navigate to specific component to find untested functions or state attributes



CASE Tools



- Sourceforge (Open Source)
 - https://sourceforge.net/directory/os:windows/
- Beliebteste Tools 2022
 - https://geekflare.com/software-engineeringtools/
 - IDEs IntelliJ / Eclipse / PyCharm
 - Code GitHub
 - Container Docker
 - CI/CD Jenkins
 - Ticketplanung JIRA