

# Lernjournal DevOps Frühlingssemester 2024

ZHAW SML  
DevOps FS2024

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Falls das Lernjournal im PDF eine schlechte Screenshot-Qualität anzeigt kann das Wordfile und die PowerPoint vom Screencast in diesem Repo heruntergeladen werden:

<https://github.com/nolevit1/lernjournal>

# 1 EINFÜHRUNG

## 1.1 PERSON, MOTIVATION, IT-KNOWHOW

Mein Name ist Vito Alessandro Nolè und ich freue mich, die Reise durch die Welt von DevOps zu dokumentieren. Ich habe vor 5 Jahren eine NodeJs App in den App- und Playstore published (Discover Neuhausen) und habe auch mit Github gearbeitet. Meine Motivation für diesen Kurs liegt darin, die Zusammenarbeit zwischen Entwicklungs- und Betriebsteams zu sehen und dadurch qualitativ hochwertige Software schneller und zuverlässiger bereitzustellen.

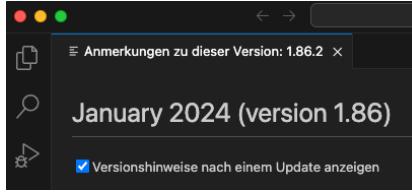
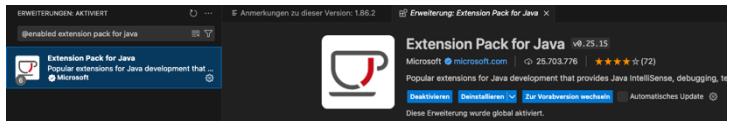
## 1.2 UMGEBUNG HARDWARE/SOFTWARE

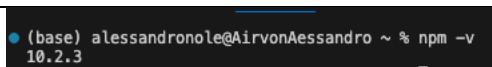
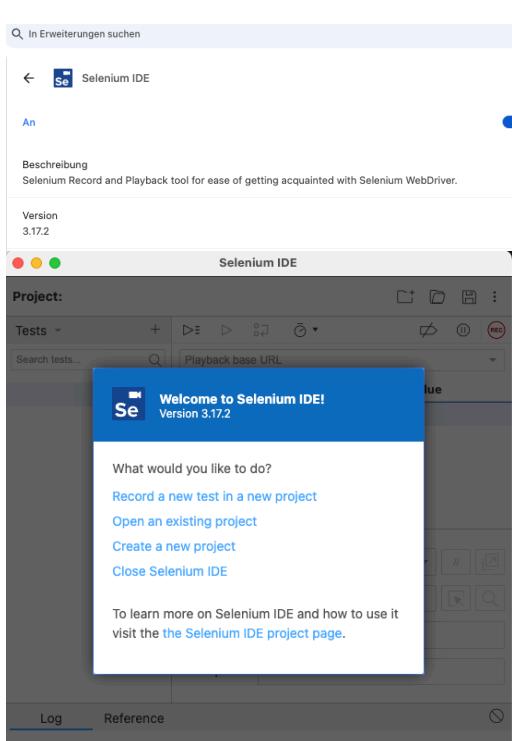
Hardware: Mac mit M1 Prozessor. Seit dem Sommer 2023 auf Apple umgestiegen und bin auf die Installation und Funktionsweisen gespannt (hoffentlich keine Probleme).

Software: Homebrew Paketmanager für macOS, der die Installation von Software vereinfacht.

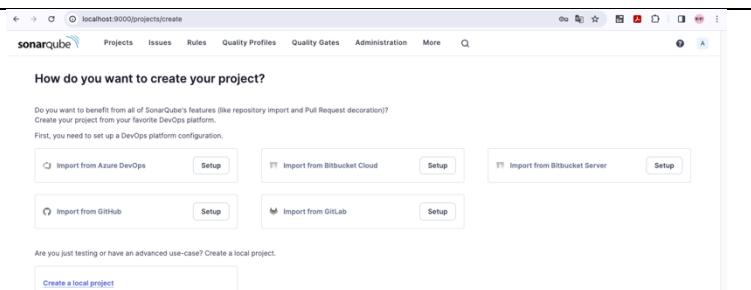
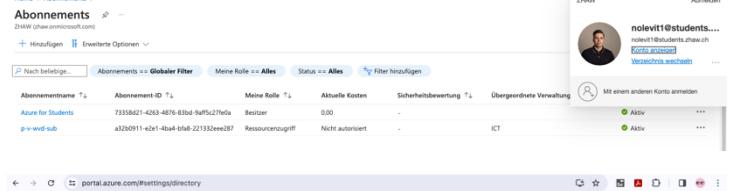
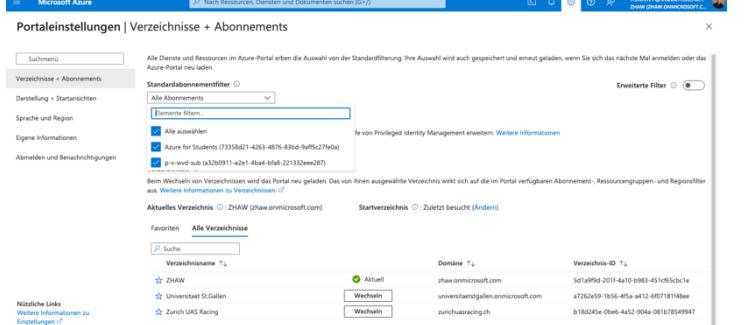
# 2 DEVOPS-LERNJOURNALE

## 2.1 INSTALLATION SOFTWARE

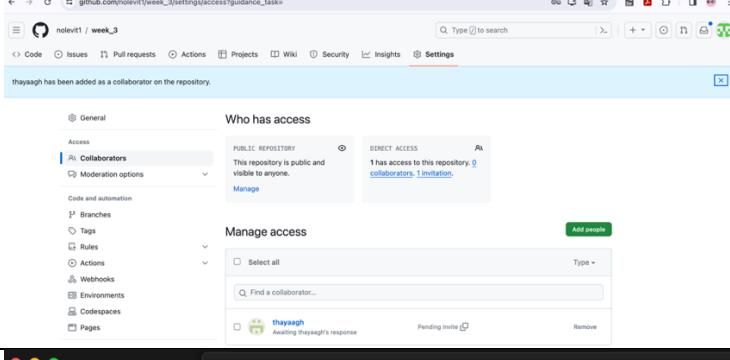
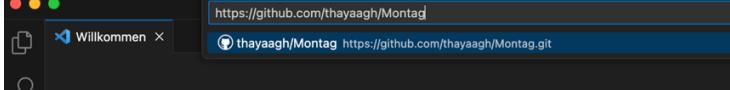
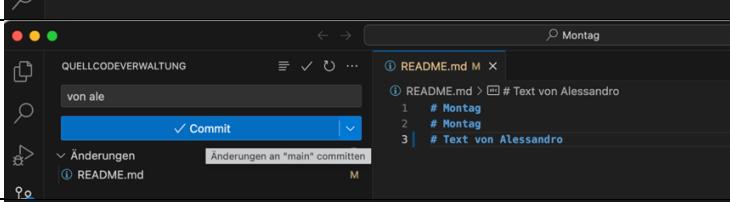
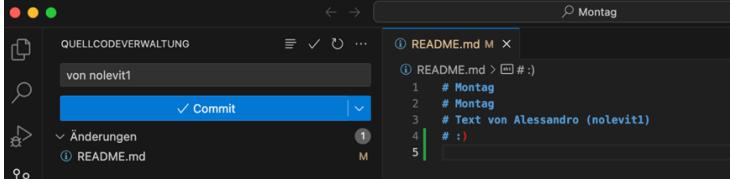
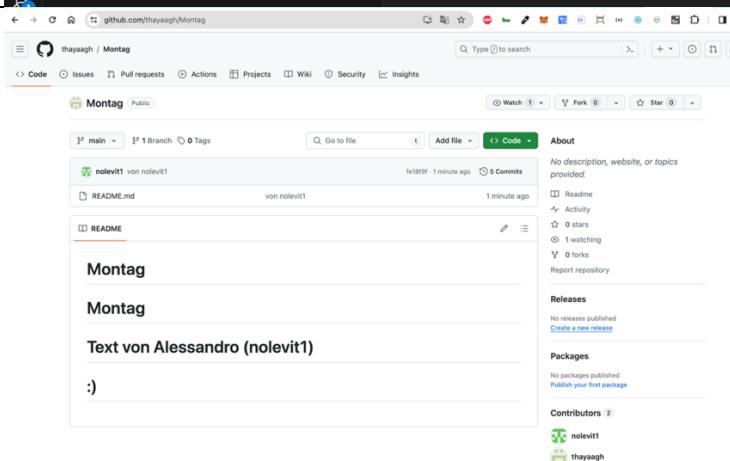
GitHub-Konto	<a href="https://github.com/nolevit1">https://github.com/nolevit1</a>
Git-Client	<pre>(base) alessandronole@AirvonAlessandro ~ % git --version git version 2.39.3 (Apple Git-146)</pre>
Java	<pre>(base) alessandronole@AirvonAlessandro ~ % java --version java 21.0.1 2023-10-17 LTS Java(TM) SE Runtime Environment (build 21.0.1+12-LTS-29) Java HotSpot(TM) 64-Bit Server VM (build 21.0.1+12-LTS-29, mixed mode, sharing)</pre>
Gradle	<pre>(base) alessandronole@AirvonAlessandro ~ % gradle --version ----- Gradle 8.6 ----- Build time: 2024-02-02 16:47:16 UTC Revision: d55c486870a0dc6f6278f53d21381396d0741c6e Kotlin: 1.9.20 Groovy: 3.0.17 Ant: Apache Ant(TM) version 1.10.13 compiled on January 4 2023 JVM: 21.0.1 (Oracle Corporation 21.0.1+12-LTS-29) OS: Mac OS X 14.4 aarch64</pre>
Visual Studio Code	
VS Extension Pack for Java	

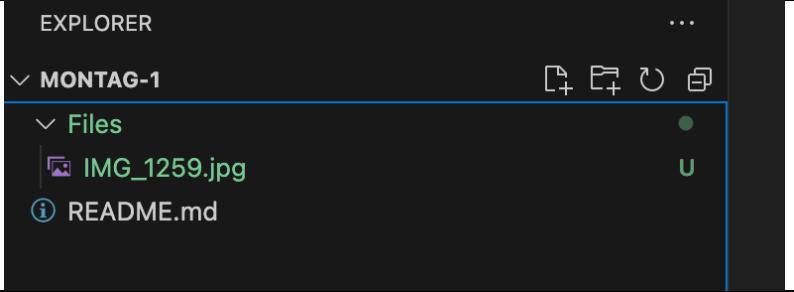
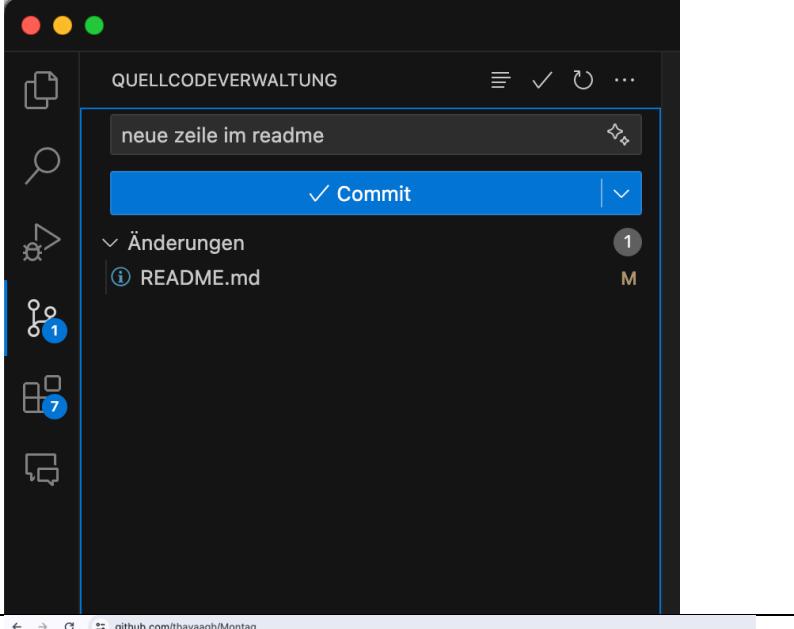
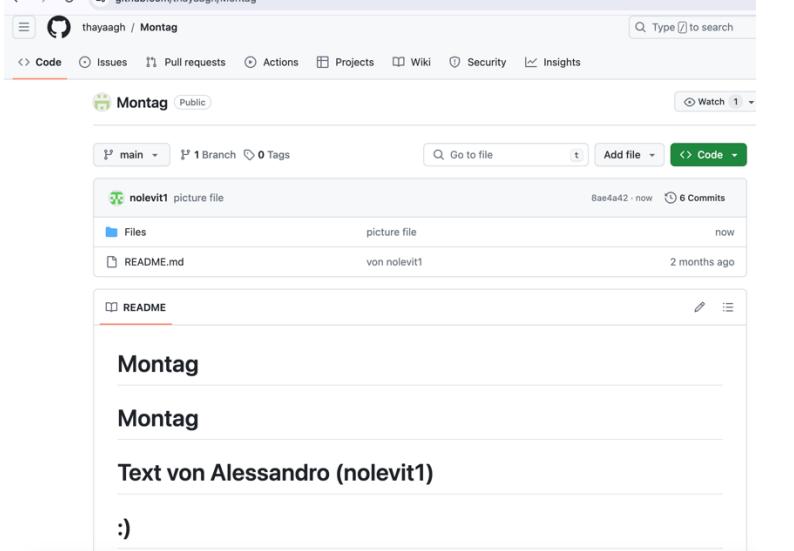
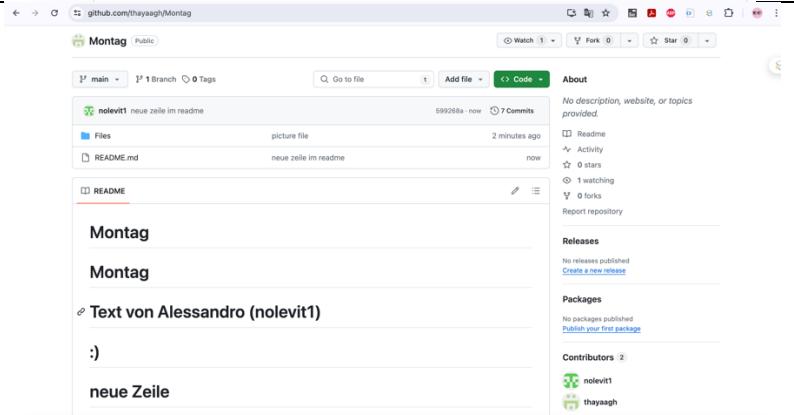
VS Extension Gradle for Java	
VS Spring Boot Extension Pack	
VS Extension Coverage Gutters	
Node	
NPM	
Selenium IDE	

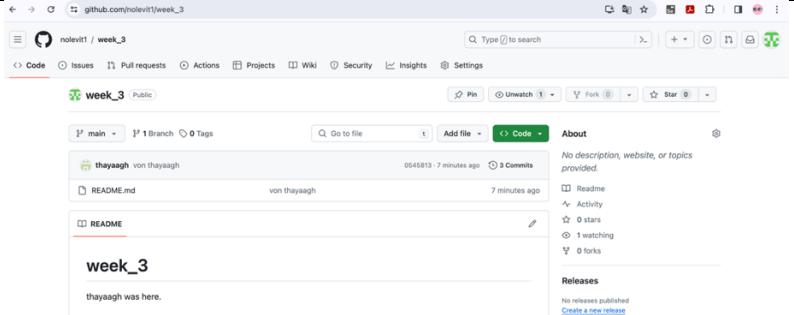
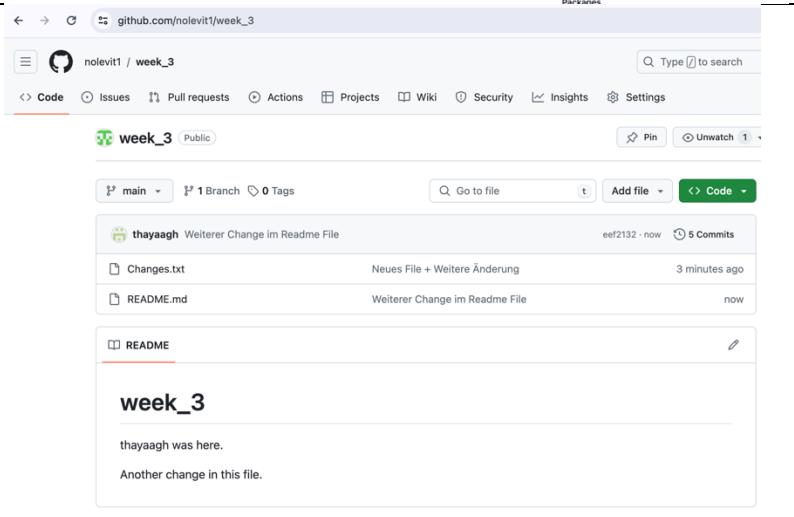
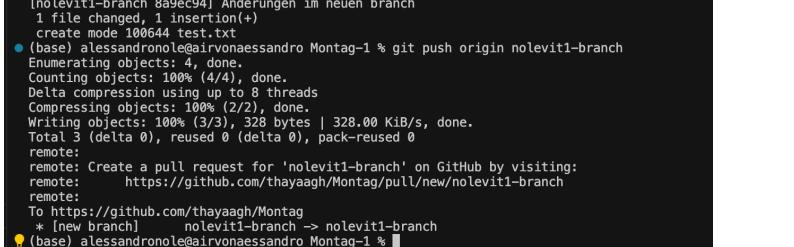
	<p>Docker Desktop</p> <p><b>Software updates</b> New version available. Current version: 4.27.2 (137060) New version: 4.28.0 (139021) Download size: 117.9 MB • <a href="#">Settings Management</a> now allows admins to set the default file-sharing implementation can add file shares to.</p> <p><b>Docker Engine</b> v25.0.3 Configure the Docker daemon by typing a json Docker daemon <a href="#">configuration file</a>. This can prevent Docker from starting, reset your daemon settings if it hangs. ({"builder": { "get": "true", "defaultKeepStorage": "200B", "enabled": true }}, "experimental": false)</p>
	<p>Docker Desktop</p> <p><b>Containers</b> Container CPU usage: 8.73% / 800% (8 CPUs available) Container memory usage: 2.78GB / 3.74GB Name Image Status CPU (%) Port(s) sonarcube sonarcube:10.4.0-community Running 8.35% 9000:9000 jenkins mosatchen/jenkins:2.426.2 Running 0.38% 8080:8080 4 minutes ago kafka_builines_zuerichExited 0% 19 days ago</p>
	<p>Docker Hub</p> <p><a href="#">hub.docker.com/settings/general</a></p> <p><b>Account Settings / General</b> nxle user Joined February 20, 2024 General Security Default Privacy Notifications Convert Account Email Address nolevit1@students.zhaw.ch Verified Edit What's New My Profile My Account Billing Sign out</p>
	<p>Jenkins</p> <p><a href="#">localhost:8080/searchPeople/</a></p> <p><b>Benutzer</b> Enthält alle bekannten Benutzer, einschließlich der Login-Benutzer des aktuellen Sicherheitsbereichs, sowie Namen, die in Commit-Kommentaren von Changelogs erwähnt werden. Jenkins Benutzer Id Name Letzte SCM-Aktivität Job admin admin N/A</p> <p>Symbol: S M L Build-Warteschlange Keine Builds geplant Build-Prozessor-Status 1 Ruhestand 2 Ruhestand</p>

SonarQube	
Azure Portal	
Azure Abonnement	
Azure CLI	
Postman	

## 2.2 VERSIONSKONTROLLE (GIT)

Person 1, Name/Kürzel	Nolè Vito Alessandro (nolevit1)
Person 1, Repo URL	<a href="https://github.com/nolevit1/week_3">https://github.com/nolevit1/week_3</a>
Person 2, Name/Kürzel	Aghishenth Thayalakumar (thayaagh)
Person 2, Repo URL	<a href="https://github.com/thayaagh/Montag">https://github.com/thayaagh/Montag</a>
Beschreibung Zusammenarbeit	Gegenseitiges Commiten von Codezeilen und Dateien, inkl. Branch mit Aghishenth. Zugriff gegenseitig als Collaborator. Klonen von seinem Projekt auf meinem Rechner und Änderungen vornehmen und commiten & pushen. Szenario als wäre er oder ich sein Lehrmeister der den Code überprüft. Dies ist der Prozess vom Programmieren bei einem Team.
Collaborator hinzufügen	
Klonen	
Änderungen vornehmen	
Weitere Änderungen vornehmen und committed und pushen	
Ansicht im Github	

Mit Files erweitern	
Weitere Änderungen	
Files ersichtlich im neuen Ordner	
Textänderungen direkt ersichtlich	

Aghishenth seine Änderungen in meinem Projekt	
Weitere Änderungen von Aghishenth in meinem Projekt	
Erstellung vom neuen Branch	
Neue Datei	
Commiten vom Branch	
Pushen vom Branch	

<p><b>Ansicht vom Branch von Aghishenth in meinem Projekt</b></p>	
<p><b>Akzeptieren vom Branch</b></p>	
<p><b>Erfolgreiches Mergen</b></p>	

## 2.3 BUILD TOOLS

### 2.3.1 GRADLE

<p>Repo URL (wurde erst im nachhinein gepusht)</p>	<a href="https://github.com/nolevit1/sw4">https://github.com/nolevit1/sw4</a>
<p>Namen der verwendeten Beispiele:   <a href="https://search.maven.org">https://search.maven.org</a></p>	

**Ascii render Library**

The screenshot shows a Java project structure in the Explorer view:

- SW4
- gradle
- vscode
- app
  - build
  - src
    - main
      - java org/example J App.java
      - resources
    - test
      - java org/example J AppTest.java
      - resources
- build.gradle
- .gitattributes
- .gitignore
- gradlew
- gradlew.bat
- settings.gradle

The build.gradle file contains the following code:

```

dependencies {
    // Use JUnit Jupiter for testing.
    testImplementation libs.junit.jupiter
    testRuntimeOnly 'org.junit.platform:junit-platform-launcher'
    // This dependency is used by the application.
    implementation libs.guava
    // added by notevit (build gradle)
    implementation 'com.indvd0m.ascii.render:ascii-render:2.2.0'
}

// Apply a specific Java toolchain to ease working on different environments.
java {
    toolchain {
        languageVersion = JavaLanguageVersion.of(21)
    }
}

application {
    // Define the main class for the application.
    mainClass = 'org.example.App'
}

```

The terminal output shows the build process:

```

Task wird ausgeführt: gradle: app:run
> Task :app:run
Hello World!
BUILD SUCCESSFUL in 317ms
2 actionable tasks: 1 executed, 1 up-to-date

```

**Testen und Erweitern**

The screenshot shows the same Java project structure and build.gradle file as the first part.

The App.java file contains the following code:

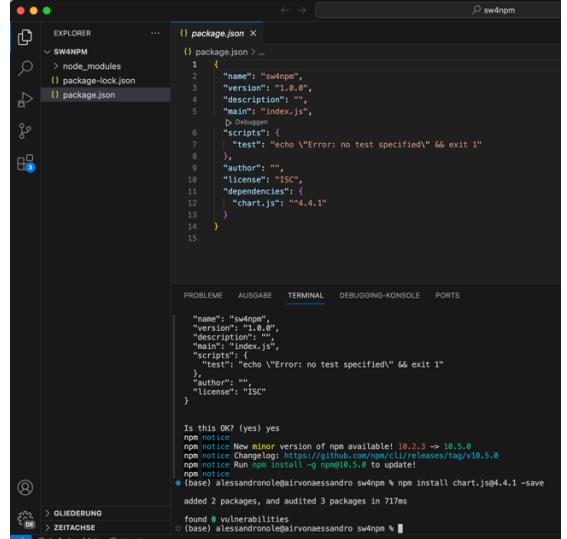
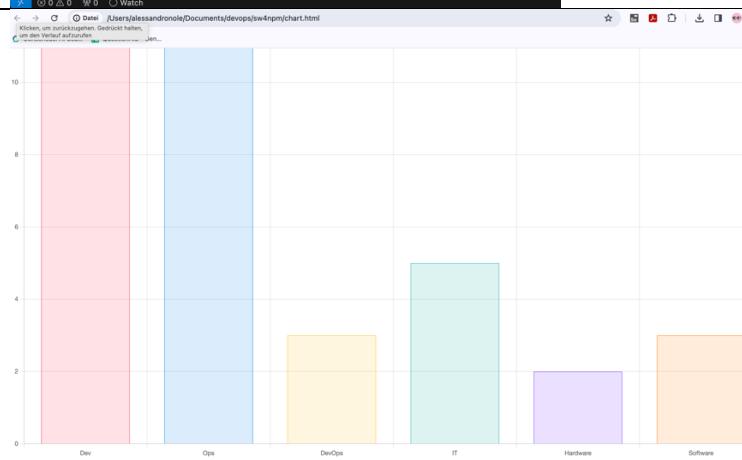
```

public static void main(String[] args) {
    IRender render = new Render();
    IContextBuilder builder = render.newBuilder();
    builder.width(120).height(20);
    builder.element(new PseudoText("DevOps Note"));
    ICanvas canvas = render.render(builder.build());
    String s = canvas.getText();
    System.out.println(new App().getGreeting());
}

```

The terminal output shows the rendered text "DevOps Note" displayed in a terminal window.

### 2.3.2 NPM

Repo URL	<a href="https://github.com/nolevit1/sw4npm">https://github.com/nolevit1/sw4npm</a>														
Namen der verwendeten Beispiele	ChartJS und AnimeJS														
NPM Install	 <pre> {   "name": "sw4npm",   "version": "0.0.1",   "description": "",   "main": "index.js",   "scripts": {     "test": "echo \"Error: no test specified\" &amp;&amp; exit 1"   },   "author": "",   "license": "ISC",   "dependencies": {     "chart.js": "^4.4.1"   } }  Is this OK? (yes) yes npm notice New minor version of npm available! 10.2.3 =&gt; 10.5.0 npm notice Change log: <a href="https://github.com/npm/cli/releases/tag/v10.5.0">https://github.com/npm/cli/releases/tag/v10.5.0</a> npm notice Run npm install -g npm@10.5.0 to update! npm notice (base) alessandrone@airvonnessandro sw4npm % npm install chart.js@4.4.1 --save added 2 packages, and audited 3 packages in 717ms found 0 vulnerabilities (base) alessandrone@airvonnessandro sw4npm % </pre>														
Neuer Chart	 <table border="1"> <thead> <tr> <th>Kategorie</th> <th>Wert</th> </tr> </thead> <tbody> <tr> <td>Dev</td> <td>10</td> </tr> <tr> <td>Ops</td> <td>3</td> </tr> <tr> <td>DevOps</td> <td>5</td> </tr> <tr> <td>IT</td> <td>2</td> </tr> <tr> <td>Hardware</td> <td>0</td> </tr> <tr> <td>Software</td> <td>0</td> </tr> </tbody> </table>	Kategorie	Wert	Dev	10	Ops	3	DevOps	5	IT	2	Hardware	0	Software	0
Kategorie	Wert														
Dev	10														
Ops	3														
DevOps	5														
IT	2														
Hardware	0														
Software	0														

**AnimeJs**

```

package.json
1 {
2   "name": "sw4npm",
3   "version": "1.0.0",
4   "description": "",
5   "main": "index.js",
6   "scripts": {
7     "test": "echo \"Error: no test specified\" && exit 1"
8   },
9   "author": "",
10  "license": "ISC",
11  "dependencies": {
12    "animejs": "^3.2.2",
13    "chart.js": "^4.4.1"
14  }
15 }
16

PROBLEME AUSGABE TERMINAL DEBUGGING-KONSEL PORTS

"test": "echo \"Error: no test specified\" && exit 1"
},
"author": "",
"license": "ISC"
}

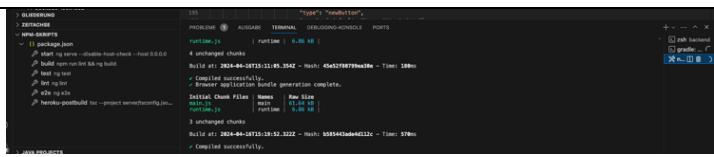
Is this OK? (yes) yes
npm notice
npm notice New minor version of npm available! 10.2.3 => 10.5.0
npm notice Change log: https://github.com/npm/cli/releases/tag/v10.5.0
npm notice Run npm install -g npm@10.5.0 to update!
npm notice
• (base) alessandronole@airvonaessandro sw4npm % npm install chart.js@4.4.1
added 2 packages, and audited 3 packages in 717ms
found 0 vulnerabilities
• (base) alessandronole@airvonaessandro sw4npm % npm install animejs@3.2.2 -
added 1 package, and audited 4 packages in 1s
found 0 vulnerabilities
• (base) alessandronole@airvonaessandro sw4npm %

```

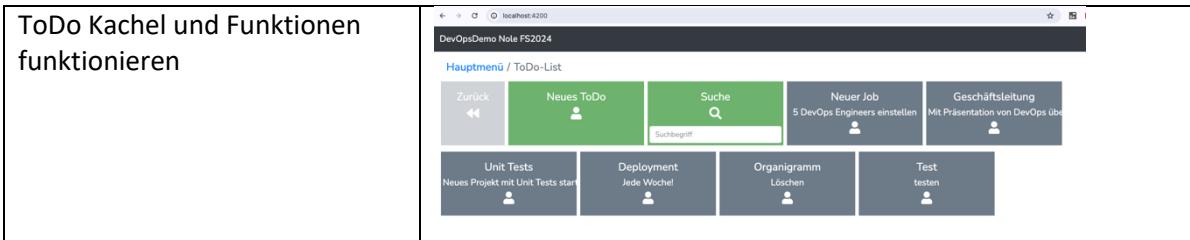
Neue Animation angepasst

## 2.4 DEVOPSDemo

### 2.4.1 DevOpsDemo (FRONTEND)

Repo URL (Fork)	<a href="https://github.com/nolevit1/DevOpsDemo">https://github.com/nolevit1/DevOpsDemo</a>
Erfolgreichere lokale Installation und Ausführung: Frontend funktioniert	
Neue Kachel für Mitarbeiteransicht im guimodel.ts  <a href="https://github.com/nolevit1/DevOpsDemo/tree/main/frontend/src/app/gui-model">https://github.com/nolevit1/DevOpsDemo/tree/main/frontend/src/app/gui-model</a>	<pre> 90      /*New Form for Employees*/ 91      { 92          "id": "EmployeeForm", 93          "title": { default: "Employee" }, 94          "url": "/employee", 95          "formFieldList": [ 96              { 97                  "id": "name", 98                  "type": "text", 99                  "name": { default: "name" }, 100                 "required": true, 101                 "width": 2 102             }, 103             { 104                 "id": "job", 105                 "type": "text", 106                 "name": { default: "job" }, 107                 "newRow": true, 108                 "maxLength": 4000, 109                 "height": 4, 110                 "width": 2 111             }, 112             { 113                 "type": "deleteButton", 114                 "name": "Delete" 115             }, 116             { 117                 "type": "cancelButton", 118                 "name": "Cancel" 119             }, 120             { 121                 "type": "okButton", 122                 "name": "Ok" 123             } 124         ], 125         /*End*/ 126     } </pre>
Neue Seite für Mitarbeiteransicht guimodel.ts  <a href="https://github.com/nolevit1/DevOpsDemo/tree/main/frontend/src/app/gui-model">https://github.com/nolevit1/DevOpsDemo/tree/main/frontend/src/app/gui-model</a>	<pre> 187     /*New Page for Employees*/ 188     { 189         "id": "employeePage", 190         "elementList": [ 191             { 192                 "type": "backbutton", 193             }, 194             { 195                 "type": "newButton", 196                 "name": { default: "Neuer Mitarbeiter" }, 197                 "icon": "fa-user", 198                 "color": "green", 199                 "width": 2, 200                 "form": { 201                     "form": "EmployeeForm" 202                 } 203             }, 204             { 205                 "type": "list", 206                 "name": "Employee", 207                 "icon": "fa-user", 208                 "color": "wet-asphalt", 209                 "search": true, 210                 "url": "/employee", 211                 "form": { 212                     "form": "EmployeeForm" 213                 } 214             } 215         ], 216         /*End*/ 217     } </pre>

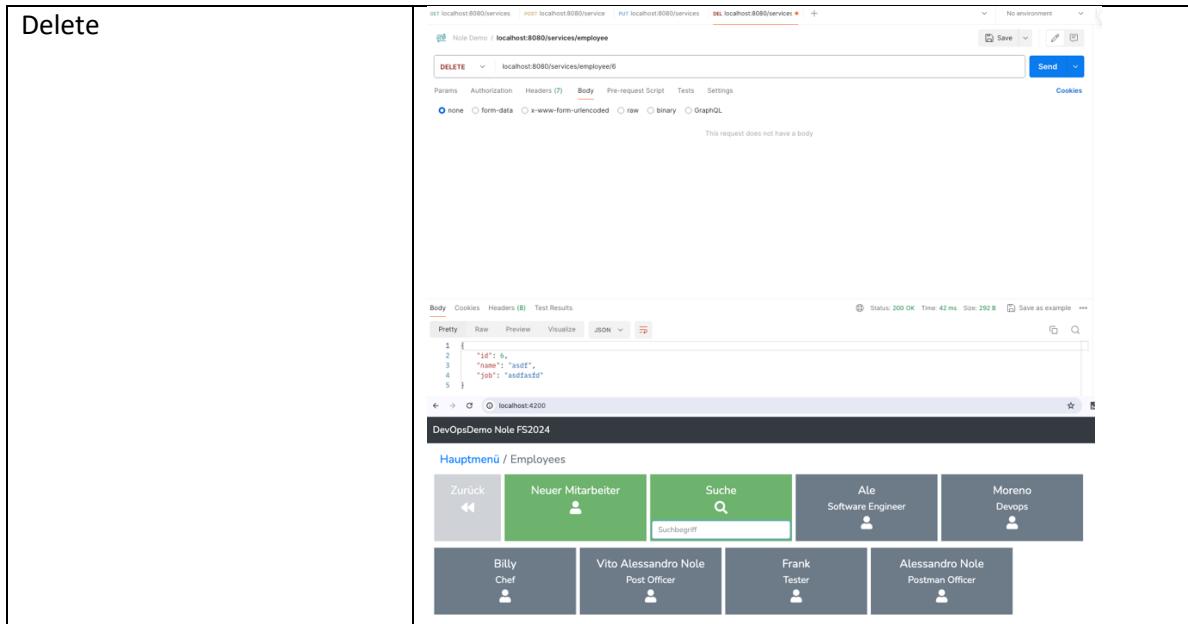
<p>Frontend Ansicht mit:</p> <ul style="list-style-type: none"> <li>- Titeländerung</li> <li>- Neue Kachel</li> <li>- Kachel mit Verlinkung auf eine neue Page</li> </ul>	<p>The screenshot shows the application's main menu at the top with the title "DevOpsDemo Nole FS2024". Below it is a "Hauptmenü" section with the text "Willkommen bei DevOps von Nole". A large blue card titled "Employees" is displayed, featuring a keyboard icon.</p>
<p>Mitarbeiter Page mit geladenen Datensätzen</p>	<p>The screenshot shows the "Employees" page. At the top, there are buttons for "Zurück", "Neuer Mitarbeiter", "Suche", and user profiles for Ale and Moreno. Below is a grid of three employee cards: "Billy Chef", "Jimmy Koch", and "Frank Tester".</p>
<p>Form für Erfassung von einem neuen Mitarbeiter</p>	<p>The screenshot shows a modal dialog for creating a new employee. It has fields for "name" (set to "John") and "job" (set to "Controlling"). Buttons for "Abbrechen" and "OK" are at the bottom.</p> <p>The screenshot shows the "Employees" page again, but now with four cards: "Billy Chef", "Jimmy Koch", "Frank Tester", and "John Controlling".</p>
<p>Suche, Löschen und zurück Button funktionieren</p>	<p>The screenshot shows the "Employees" page with a search bar containing "john". A modal dialog for "Employee" shows the results for "John Controlling". Buttons for "Löschen" (Delete) and "OK" are visible.</p>



## 2.4.2 SPRING Boot (BACKEND)

<pre> 22  public class EmployeeController { 23 24      private Map&lt;Integer, Employee&gt; employees = new HashMap&lt;Integer, Employee&gt;(); 25 26      @EventListener(ApplicationReadyEvent.class) 27      public void init() { 28          this.employees.put(key:1,new Employee(id:1, name:"Ale", job:"Software Engineer")); 29          this.employees.put(key:2,new Employee(id:2, name:"Moreno", job:"Devops")); 30          this.employees.put(key:3,new Employee(id:3, name:"Billy", job:"Chef")); 31          this.employees.put(key:4,new Employee(id:4, name:"Jimmy", job:"Koch")); 32          this.employees.put(key:5,new Employee(id:5, name:"Frank", job:"Tester")); 33          System.out.println("Init Data Employee"); 34      } 35 36      @GetMapping("/testemployee") 37      public String testemployee() { 38          return "Employee app is up and running!"; 39      } 40 41      @GetMapping("/countemployee") 42      public int countemployee() { 43          return this.employees.size(); 44      } 45 46      @GetMapping("/services/employee") 47      public List&lt;PathListEntry&lt;Integer&gt;&gt; employee() { 48          var result = new ArrayList&lt;PathListEntry&lt;Integer&gt;&gt;(); 49          for (var employee : this.employees.values()) { 50              var entry = new PathListEntry&lt;Integer&gt;(); 51              entry.setKey(employee.getId(), name:"employeeKey"); 52              entry.setName(employee.getName()); 53              entry.getDetails().add(employee.getJob()); 54              entry.setToolTip(employee.getJob()); 55              result.add(entry); 56          } 57          return result; 58      } 59 60      @GetMapping("/services/employee/{key}") 61      public Employee getEmployee(@PathVariable Integer key) { 62          return this.employees.get(key); 63      } 64 65      @PostMapping("/services/employee") 66      public void createEmployee(@RequestBody Employee employee) { 67          var newId = this.employees.keySet().stream().max(Comparator.naturalOrder()).orElse(0) + 1; 68          employee.setId(newId); 69          this.employees.put(newId, employee); 70      } 71 72      @PutMapping("/services/employee/{id}") 73      public void createEmployee(@PathVariable Integer id, @RequestBody Employee employee) { 74          employee.setId(id); 75          this.employees.put(id, employee); 76      } 77 78      @DeleteMapping("/services/employee/{key}") 79      public Employee deleteEmployee(@PathVariable Integer key) { 80          return this.employees.remove(key); 81      } 82 83  } </pre>	<p>Test</p>
<p>Anzahl Mitarbeiter</p>	
<p>Alle Mitarbeiter</p>	
<p>Test direkt auf Mitarbeiterdaten</p>	

Get	<pre> [{"id": 1, "name": "Alessandro Nole", "job": "Software Engineer", "active": true}, {"id": 2, "name": "Vito Alessandro Nole", "job": "Post Officer", "active": true}, {"id": 3, "name": "Frank Tester", "job": "Tester", "active": false}, {"id": 4, "name": "asdf", "job": "asdfsdf", "active": false}, {"id": 5, "name": "Alessandro Nole", "job": "Postman Officer", "active": true} ] </pre>
Post	<pre>{   "id": 7,   "name": "Alessandro Nole",   "job": "Postman Officer" }</pre>
Put	<pre>{   "id": 5,   "name": "Vito Alessandro Nole",   "job": "Post Officer" }</pre>



## 2.5 UNIT TESTS

Repo URL	<a href="https://github.com/nolevit1/sw6">https://github.com/nolevit1/sw6</a>
Titel Idee	Score Keeper Kata (Basketball Punkte)
Beschreibung und Ziel der Software	Bereitstellung richtiger Daten auf den Anzeigetafeln der Basketballspiele. Jedes der beiden Teams (Team A und Team B) kann entweder 1, 2 oder 3 Punkte in einem Spielzug erzielen.
Quelle Idee	<a href="https://kata-log.rocks/score-keeper-kata">https://kata-log.rocks/score-keeper-kata</a>
Schritt 1: Test schreiben	<p>Als erster Schritt wird ein Test im AppTest.java geschrieben</p> <pre>class AppTest {     @Test     public void testInitialScore() {         ScoreKeeper scoreKeeper = new ScoreKeeper();         assertEquals("000:000", scoreKeeper.getScore());     } }</pre>
Der Code wird nicht kompiliert, da es die Klasse ScoreKeeper gar noch nicht gibt.	
Schritt 2:	<p>Nun wird die fehlende Klasse erstellt. Der Code kompiliert und der Test wird grün.</p> <p>File Explorer view showing the project structure and code editor view showing the ScoreKeeper.java file.</p> <pre>EXPLORER   - sw6     - .gradle     - app       - build       - src         - main           - java/org/example             - App.java             - ScoreKeeper.java</pre> <pre>app &gt; src &gt; main &gt; java &gt; org &gt; example &gt; ScoreKeeper.java 1 package org.example; 2 3 public class ScoreKeeper { 4     private int scoreTeamA; 5     private int scoreTeamB; 6 7     public ScoreKeeper() { 8         scoreTeamA = 0; 9         scoreTeamB = 0; 10    }</pre>

<p>Schritt 3:</p> <p><b>Nicht die Logik weiterprogrammieren, sondern wieder einen <b>neuen Test</b> schreiben</b></p>	<pre>J AppTest.java U × J ScoreKeeper.java U app &gt; src &gt; test &gt; java &gt; org &gt; example &gt; J AppTest.java &gt; AppTest &gt; testInitialScore() 1  /* 2   * This Java source file was generated by the Gradle 'init' task. 3   */ 4  package org.example; 5 6  import org.junit.jupiter.api.Test; 7  import static org.junit.jupiter.api.Assertions.*; 8 9  class AppTest { 10 11     @Test 12     public void testInitialScore() { 13         ScoreKeeper scoreKeeper = new ScoreKeeper(); 14         assertEquals(expected:"000:000", scoreKeeper.getScore()); 15     } 16 } 17 18 19 20 21 22 23 24 25</pre> <pre>J AppTest.java 1,M × J ScoreKeeper.java M J App.java 1 app &gt; src &gt; test &gt; java &gt; org &gt; example &gt; J AppTest.java &gt; AppTest &gt; testScoreTeamA1() 1  /* 2   * This Java source file was generated by the Gradle 'init' task. 3   */ 4  package org.example; 5 6  import org.junit.jupiter.api.Test; 7  import static org.junit.jupiter.api.Assertions.*; 8 9  class AppTest { 10 11     @Test 12     public void testInitialScore() { 13         ScoreKeeper scoreKeeper = new ScoreKeeper(); 14         assertEquals(expected:"000:000", scoreKeeper.getScore()); 15     } 16 17     @Test 18     public void testScoreTeamA1() { 19         ScoreKeeper scoreKeeper = new ScoreKeeper(); 20         scoreKeeper.scoreTeamA1(); 21         assertEquals(expected:"001:000", scoreKeeper.getScore()); 22     } 23 24 25 26 27 28 29 30 31 32</pre> <p>PROBLEME 2 AUSGABE TERMINAL DEBUGGING-KONSOLE PORTS TESTERGEBNISSE Filtern (Beispiel: text, **"/ts, **"/node_modules)**</p> <ul style="list-style-type: none"> <li>App.java app/src/main/java/org/example ① <ul style="list-style-type: none"> <li>The method scoreTeamA1() is undefined for the type ScoreKeeper Java(67108964) [Zeile 10, Spalte 21]</li> </ul> </li> <li>AppTest.java app/src/test/java/org/example ① <ul style="list-style-type: none"> <li>The method scoreTeamA1() is undefined for the type ScoreKeeper Java(67108964) [Zeile 20, Spalte 21]</li> </ul> </li> </ul>
<p>Schritt 4-5:</p> <p>Nun wird der Code angepasst und es werden alle bestehenden Tests gestartet:</p>	<pre>J AppTest.java 2 × J ScoreKeeper.java J App.java 1 app &gt; src &gt; test &gt; java &gt; org &gt; example &gt; J AppTest.java &gt; ... 2  /* 3   * This Java source file was generated by the Gradle 'init' task. 4   */ 5  package org.example; 6 7  import org.junit.jupiter.api.Test; 8  import static org.junit.jupiter.api.Assertions.*; 9 10 class AppTest { 11 12     @Test 13     public void testInitialScore() { 14         ScoreKeeper scoreKeeper = new ScoreKeeper(); 15         assertEquals(expected:"000:000", scoreKeeper.getScore()); 16     } 17 18     @Test 19     public void testScoreTeamA1() { 20         ScoreKeeper scoreKeeper = new ScoreKeeper(); 21         scoreKeeper.scoreTeamA1(); 22         assertEquals(expected:"001:000", scoreKeeper.getScore()); 23     } 24 25     @Test 26     public void testScoreTeamA2() { 27         ScoreKeeper scoreKeeper = new ScoreKeeper(); 28         scoreKeeper.scoreTeamA2(); 29         assertEquals(expected:"002:000", scoreKeeper.getScore()); 30     } 31 } 32</pre>

## Schritt 6:

Klasse wird angepasst und test werden erfolgreich ausgeführt.

```

J AppTest.java x J ScoreKeeper.java M J App.java M
app > src > test > java > org > example > J AppTest.java > ...
2  * This Java source file was generated by the Gradle 'init' task.
3  *
4  * package org.example;
5  *
6  * import org.junit.jupiter.api.Test;
7  * import static org.junit.jupiter.api.Assertions.*;
8  *
9  * class AppTest {
10  *
11  *     @Test
12  *     public void testInitialScore() {
13  *         ScoreKeeper scoreKeeper = new ScoreKeeper();
14  *         assertEquals(expected:"000:000", scoreKeeper.getScore());
15  *     }
16  *
17  *     @Test
18  *     public void testScoreTeamA1() {
19  *         ScoreKeeper scoreKeeper = new ScoreKeeper();
20  *         scoreKeeper.scoreTeamA1();
21  *         assertEquals(expected:"001:000", scoreKeeper.getScore());
22  *     }
23  *
24  *     @Test
25  *     public void testScoreTeamA2() {
26  *         ScoreKeeper scoreKeeper = new ScoreKeeper();
27  *         scoreKeeper.scoreTeamA2();
28  *         assertEquals(expected:"002:000", scoreKeeper.getScore());
29  *     }
30  *
31  * }
32

```

PROBLEME AUSGABE TERMINAL DEBUGGING-KONSOLE PORTS TESTERGEBNISSE

```

%TESTC 1 V2
%TESTE 1,org.example.AppTest,true,1,false,1,AppTest,,[engine:junit-jupiter]/[class:org.example.AppTest]
%STRTREE3,testScoreTeamA2(org.example.AppTest),false,1,false,2,testScoreTeamA2(),,[engine:junit-jupiter]/[class:org.example.AppTest],,[method:testScoreTeamA2()]
%TESTS 3,testScoreTeamA2(org.example.AppTest)
%RUNTIME48

```

Zelle 32, Spalte 1 Leerzeichen: 4 UTF-8 LF ☰ Java ⚡

## Schritt 7:

Weitere Tests

```

43     }
44
45     @Test
46     public void testScoreTeamB2() {
47         ScoreKeeper scoreKeeper = new ScoreKeeper();
48         scoreKeeper.scoreTeamB2();
49         assertEquals(expected:"000:002", scoreKeeper.getScore());
50     }
51
52     @Test
53     public void testScoreTeamB3() {
54         ScoreKeeper scoreKeeper = new ScoreKeeper();
55         scoreKeeper.scoreTeamB3();
56         assertEquals(expected:"000:003", scoreKeeper.getScore());
57     }
58
59     @Test
60     public void testCombinedScore() {
61         ScoreKeeper scoreKeeper = new ScoreKeeper();
62         scoreKeeper.scoreTeamA1();
63         scoreKeeper.scoreTeamA2();
64         scoreKeeper.scoreTeamA3();
65         scoreKeeper.scoreTeamB1();
66         scoreKeeper.scoreTeamB2();
67         scoreKeeper.scoreTeamB3();
68         assertEquals(expected:"006:006", scoreKeeper.getScore());
69     }
70 }
71

```

PROBLEME 6 AUSGABE TERMINAL DEBUGGING-KONSOLE PORTS TESTERGEBNISSE

✓ J AppTest.java app/src/test/java/org/example [6]

- ☒ The method scoreTeamB1() is undefined for the type ScoreKeeper Java(67108964) [Zeile 41, Spalte 21]
- ☒ The method scoreTeamB2() is undefined for the type ScoreKeeper Java(67108964) [Zeile 48, Spalte 21]
- ☒ The method scoreTeamB3() is undefined for the type ScoreKeeper Java(67108964) [Zeile 55, Spalte 21]
- ☒ The method scoreTeamB1() is undefined for the type ScoreKeeper Java(67108964) [Zeile 65, Spalte 21]
- ☒ The method scoreTeamB2() is undefined for the type ScoreKeeper Java(67108964) [Zeile 66, Spalte 21]
- ☒ The method scoreTeamB3() is undefined for the type ScoreKeeper Java(67108964) [Zeile 67, Spalte 21]

Zelle 32, Spalte 1 Leerzeichen: 4 UTF-8 LF ☰ Java ⚡

**Schritt 8:****Code Anpassung**

```

J AppTest.java X J ScoreKeeper.java J App.java
app > src > test > java > example > J AppTest.java > ...
39  public void testScoreTeamB1() {
40      Scorekeeper scorekeeper = new Scorekeeper();
41      scorekeeper.scoreTeamB1();
42      assertEquals(expected:"000:001", scorekeeper.getScore());
43  }
44
45  @Test
46  public void testScoreTeamB2() {
47      Scorekeeper scorekeeper = new Scorekeeper();
48      scorekeeper.scoreTeamB2();
49      assertEquals(expected:"000:002", scorekeeper.getScore());
50  }
51
52  @Test
53  public void testScoreTeamB3() {
54      Scorekeeper scorekeeper = new Scorekeeper();
55      scorekeeper.scoreTeamB3();
56      assertEquals(expected:"000:003", scorekeeper.getScore());
57  }
58
59  @Test
60  public void testCombinedScore() {
61      Scorekeeper scorekeeper = new Scorekeeper();
62      scorekeeper.scoreTeamA1();
63      scorekeeper.scoreTeamA2();
64      scorekeeper.scoreTeamA3();
65      scorekeeper.scoreTeamB1();
66      scorekeeper.scoreTeamB2();
67      scorekeeper.scoreTeamB3();
68      assertEquals(expected:"000:006", scorekeeper.getScore());
69  }
70
71

```

PROBLEME AUSGABE TERMINAL DEBUGGING-KONSOLE PORTS TESTERGEBNISSE

TESTC 1 v2  
#TESTE2,org.example.AppTest,true,1,false,1,AppTest,,[engine:junit-jupiter]/[class:org.example.AppTest]/[method:testScoreTeamB1],,[engine:junit-jupiter]/[class:org.example.AppTest]/[method:testScoreTeamB2],,[engine:junit-jupiter]/[class:org.example.AppTest]/[method:testScoreTeamB3],,[engine:junit-jupiter]/[class:org.example.AppTest]

TESTE 3,testScoreTeamB2(org.example.AppTest)

RUNTIME44

Zelle 71, Spalte 1 Leerzeichen: 4 UTF-8 LF () Java

**Schritt 9-11:**

Refactoring und weitere Test und Anpassungen nach dem Fehlschlagen der Test.

```

38  public void scoreTeamA(int points) {
39      scoreTeamA += points;
40  }
41
42  public void scoreTeamB(int points) {
43      scoreTeamB += points;
44  }
45
46  public String getScore() {
47      return String.format(format:"%03d:%03d", scoreTeamA, scoreTeamB);
48  }
49
50

```

```

18
19  /* Refactoring*/
20  scoreKeeper.scoreTeamA(points:1);
21  scoreKeeper.scoreTeamA(points:2);
22  scoreKeeper.scoreTeamA(points:3);
23  scoreKeeper.scoreTeamB(points:1);
24  scoreKeeper.scoreTeamB(points:2);
25  scoreKeeper.scoreTeamB(points:3);
26
27  System.out.println(scoreKeeper.getScore());
28
29 }

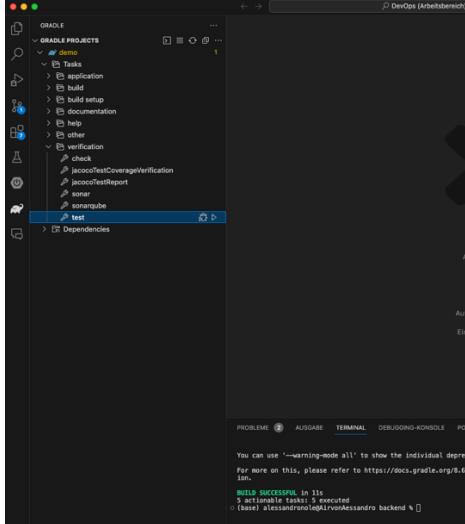
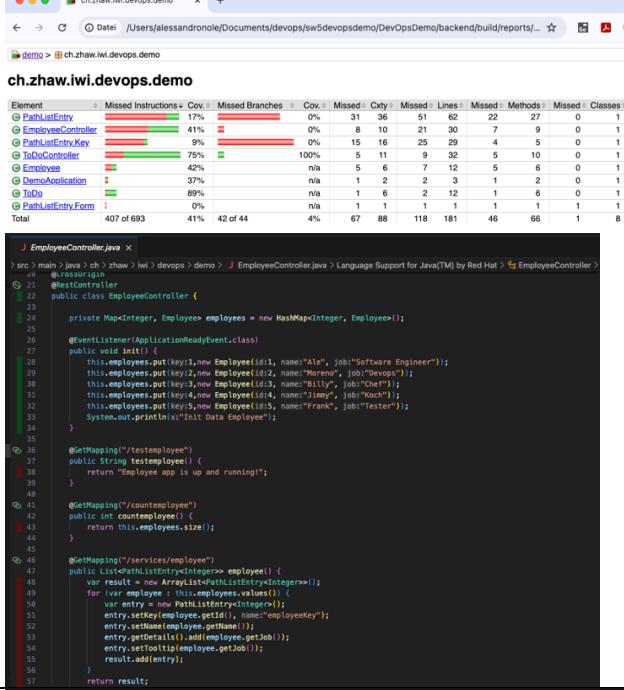
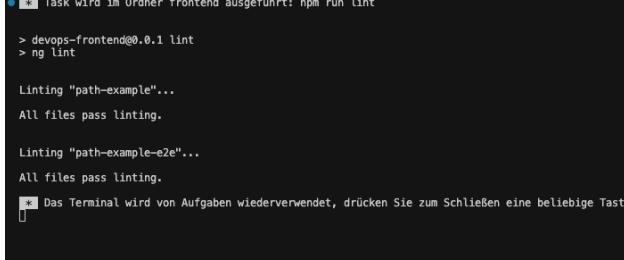
```

PROBLEME AUSGABE TERMINAL DEBUGGING-KONSOLE PORTS TESTERGEBNISSE

(base) alessandronole@CL4067 sw6 % /usr/bin/env /Library/Java/JavaVirtualMachines/jdk-d5r6brj6r9dtbh0000gn/T/cp\_3n03tufxfitem2z6soeotaeer.argfile org.example.App 006:006

(base) alessandronole@CL4067 sw6 %

## 2.6 CODE QUALITY

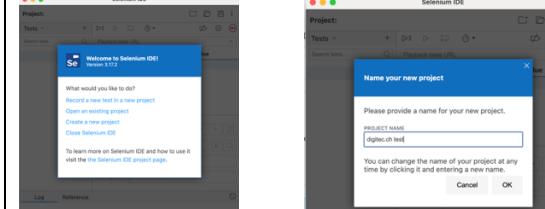
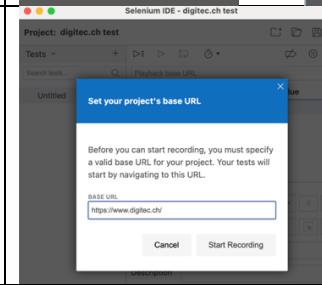
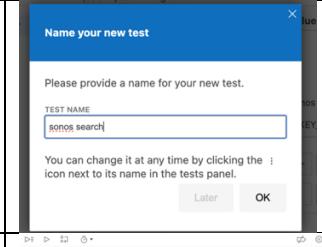
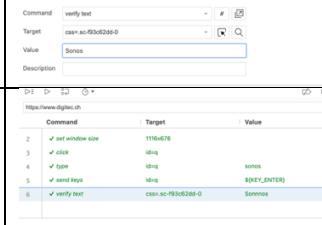
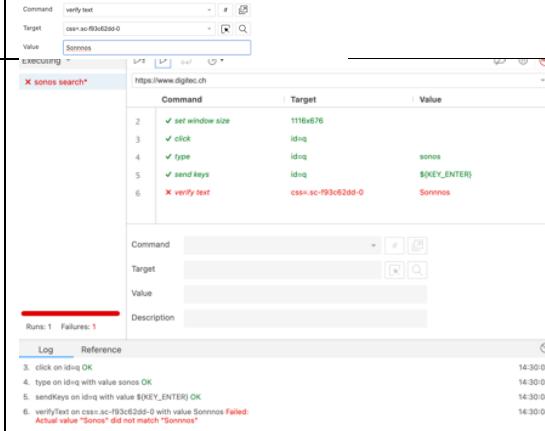
Repo URL	<a href="https://github.com/nolevit1/DevOpsDemo">https://github.com/nolevit1/DevOpsDemo</a>																																																																																																																										
Gradle – Tasks Verification	 <p>The screenshot shows the Android Studio interface with the 'GRADLE PROJECTS' view open. Under the 'demo' project, the 'Tasks' section is expanded, and the 'test' task is highlighted with a blue selection bar. Other tasks like application, build, build setup, implementation, help, and other are also listed.</p>																																																																																																																										
Jacoco Test Coverage	 <p>The screenshot shows a Java code editor with the file 'EmployeeController.java' open. Above the code, a coverage report table is displayed:</p> <table border="1"> <thead> <tr> <th>Element</th> <th>Missed Instructions</th> <th>Cov.</th> <th>Missed Branches</th> <th>Cov.</th> <th>Missed</th> <th>Ctry</th> <th>Missed</th> <th>Lines</th> <th>Missed</th> <th>Methods</th> <th>Missed</th> <th>Classes</th> </tr> </thead> <tbody> <tr> <td>PathListEntry</td> <td>17%</td> <td>83%</td> <td>0%</td> <td>31</td> <td>36</td> <td>51</td> <td>62</td> <td>22</td> <td>27</td> <td>0</td> <td>1</td> </tr> <tr> <td>EmployeeController</td> <td>41%</td> <td>58%</td> <td>0%</td> <td>8</td> <td>10</td> <td>21</td> <td>30</td> <td>7</td> <td>9</td> <td>0</td> <td>1</td> </tr> <tr> <td>PathListEntryKey</td> <td>9%</td> <td>91%</td> <td>0%</td> <td>15</td> <td>16</td> <td>25</td> <td>29</td> <td>4</td> <td>5</td> <td>5</td> <td>1</td> </tr> <tr> <td>ToDoController</td> <td>75%</td> <td>25%</td> <td>100%</td> <td>5</td> <td>11</td> <td>9</td> <td>32</td> <td>5</td> <td>10</td> <td>0</td> <td>1</td> </tr> <tr> <td>Employee</td> <td>42%</td> <td>57%</td> <td>n/a</td> <td>5</td> <td>6</td> <td>7</td> <td>12</td> <td>5</td> <td>6</td> <td>0</td> <td>1</td> </tr> <tr> <td>DemoApplication</td> <td>37%</td> <td>63%</td> <td>n/a</td> <td>1</td> <td>2</td> <td>2</td> <td>3</td> <td>1</td> <td>2</td> <td>0</td> <td>1</td> </tr> <tr> <td>ToDo</td> <td>89%</td> <td>11%</td> <td>n/a</td> <td>1</td> <td>6</td> <td>2</td> <td>12</td> <td>1</td> <td>6</td> <td>0</td> <td>1</td> </tr> <tr> <td>PathListEntryForm</td> <td>0%</td> <td>100%</td> <td>n/a</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>Total</td> <td>407 of 693</td> <td>41%</td> <td>42 of 44</td> <td>4%</td> <td>67</td> <td>68</td> <td>118</td> <td>181</td> <td>46</td> <td>66</td> <td>1</td> <td>8</td> </tr> </tbody> </table>	Element	Missed Instructions	Cov.	Missed Branches	Cov.	Missed	Ctry	Missed	Lines	Missed	Methods	Missed	Classes	PathListEntry	17%	83%	0%	31	36	51	62	22	27	0	1	EmployeeController	41%	58%	0%	8	10	21	30	7	9	0	1	PathListEntryKey	9%	91%	0%	15	16	25	29	4	5	5	1	ToDoController	75%	25%	100%	5	11	9	32	5	10	0	1	Employee	42%	57%	n/a	5	6	7	12	5	6	0	1	DemoApplication	37%	63%	n/a	1	2	2	3	1	2	0	1	ToDo	89%	11%	n/a	1	6	2	12	1	6	0	1	PathListEntryForm	0%	100%	n/a	1	1	1	1	1	1	1	1	Total	407 of 693	41%	42 of 44	4%	67	68	118	181	46	66	1	8
Element	Missed Instructions	Cov.	Missed Branches	Cov.	Missed	Ctry	Missed	Lines	Missed	Methods	Missed	Classes																																																																																																															
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Total	407 of 693	41%	42 of 44	4%	67	68	118	181	46	66	1	8																																																																																																															
Frontend Lint Test	 <pre> Task wird im Ordner frontend ausgeführt: npm run lint &gt; devops-frontend@0.0.1 lint &gt; ng lint  Linting "path-example"... All files pass linting.  Linting "path-example-e2e"... All files pass linting.  Das Terminal wird von Aufgaben wiederverwendet, drücken Sie zum Schließen eine beliebige Taste. </pre>																																																																																																																										

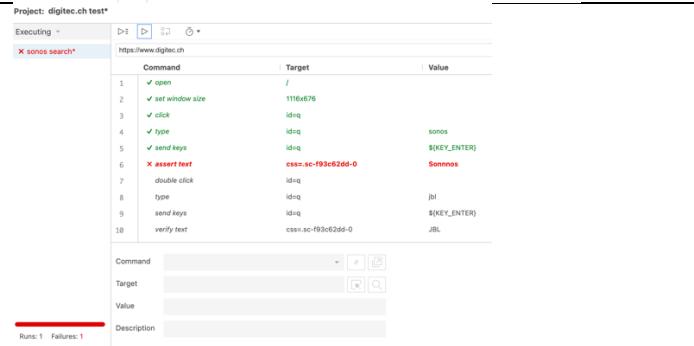
Fehler einbauen	<pre>frontend &gt; src &gt; app &gt; gui-model &gt; ts guimodels.ts GuiModel &gt; application &gt; formList &gt; id 1  /* tslint:disable:max-line-length */ 2  export class GuiModel { 3 4    private _guiModel = { 5      "application": { 6        "title": "DevOpsDemo Note FS2024", 7        "formList": [ 8          { 9            "id": "OwnUserForm", 10           "title": "Notimplemented", 11           "formFieldList": [ 12             { 13               "type": "okButton", 14               "name": "Ok" 15             } 16           ], 17         }, 18         { 19           "id": "NotImplementedForm", 20           "title": "Not Implemented", 21           "url": "/dummyform", 22           "headerVisible": false, 23           "footerVisible": false, 24           "borderStyle": "None", 25           "formFieldList": [ 26             { 27               "id": "NotImplemented", 28               "type": "label", 29               "name": "NotimplementedMessage", 30               "width": 2 31             }, 32           ] 33         } 34       ] 35     } 36   } 37 }</pre> <p>PROBLEME 2 AUSGABE TERMINAL DEBUGGING-KONSOLE PORTS TESTERGEBNISSE</p> <pre>Linting "path-example"... /Users/alessandronole/Documents/devops/sw5devopsdemo/DevOpsDemo/frontend/src/app/gui-model/guimodel.ts 9:27 error Strings must use doublequote quotes  ✖ 1 problem (1 error, 0 warnings)   1 error and 0 warnings potentially fixable with the '--fix' option.  Lint errors found in the listed files.  Linting "path-example-e2e"... /Users/alessandronole/Documents/devops/sw5devopsdemo/DevOpsDemo/frontend/src/app/gui-model/guimodel.ts 9:27 error Strings must use doublequote quotes  ✖ 1 problem (1 error, 0 warnings)   1 error and 0 warnings potentially fixable with the '--fix' option.  Lint errors found in the listed files.  ✖ Der Terminalprozess "/bin/zsh -l", '-c', 'npm run lint' wurde mit folgendem Exitcode beendet: 1. ✖ Das Terminal wird von Aufgaben wiederverwendet, drücken Sie zum Schließen eine beliebige Taste.</pre>						
ES LINT zeigt den Fehler an, damit man lint nicht immer ausführen muss	<pre>TS guimodels 1.M ×</pre> <pre>frontend &gt; src &gt; app &gt; gui-model &gt; ts guimodels.ts GuiModel &gt; application &gt; formList &gt; id 1  /* tslint:disable:max-line-length */ 2  export class GuiModel { 3 4    private _guiModel = { 5      "application": { 6        "title": "DevOpsDemo Note FS2024", 7        "formList": [ 8          { 9            "id": "OwnUserForm", 10           "title": "Notimplemented", 11           "formFieldList": [ 12             { 13               "type": "okButton", 14               "name": "Ok" 15             } 16           ], 17         }, 18         { 19           "id": "NotImplementedForm", 20           "title": "Not Implemented", 21           "url": "/dummyform", 22           "headerVisible": false, 23           "footerVisible": false, 24           "borderStyle": "None", 25           "formFieldList": [ 26             { 27               "id": "NotImplemented", 28               "type": "label", 29               "name": "NotimplementedMessage", 30               "width": 2 31             }, 32           ] 33         } 34       ] 35     } 36   } 37 }</pre>						
Gradle Sonar	<pre>(base) alessandronole@AirvonAlessandro backend % gradle sonar -Dsonar.projectKey=devopsdemo-backend -Dsonar.projectName='devopsdemo-backend' -Dsonar.host.url=http://localhost:9000 -Dsonar.token=sq_ecee7d3234c1c5f48c894f1f66a92ed9ccff6c07 &gt; Configure project : The 'sonar' task depends on compile tasks. This behavior is now deprecated and will be removed in version 5.x. To avoid implicit compilation, set property 'sonar.gradle.skipCompile' to 'true' and make sure your project is compiled, before analysis has started. The 'sonar' task depends on compile tasks. This behavior is now deprecated and will be removed in version 5.x. To avoid implicit compilation, set property 'sonar.gradle.skipCompile' to 'true' and make sure your project is compiled, before analysis has started.  Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0. You can use '-warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plug-ins.  For more on this, please refer to https://docs.gradle.org/8.6/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.  BUILD SUCCESSFUL in 9s 4 actionable tasks: 1 executed, 3 up-to-date (base) alessandronole@AirvonAlessandro backend %</pre>						
Befehl	gradle sonar -Dsonar.projectKey=devopsdemo-backend -Dsonar.projectName='devopsdemo-backend' -Dsonar.host.url=http://localhost:9000 -Dsonar.token=sq_ecee7d3234c1c5f48c894f1f66a92ed9ccff6c07						
Sonarqube Dashboard	<p>Search for projects... Perspective Overall Status Sort by Name 1 project(s)</p> <p>Passed</p> <p>devopsdemo-backend PUBLIC</p> <p>Last analysis: 2 minutes ago • 388 Lines of Code • Java</p> <table> <tbody> <tr> <td>A 0 Bugs</td> <td>A 0 Vulnerabilities</td> <td>E 0.0% Hotspots Reviewed</td> <td>C 17 Code Smells</td> <td>33.6% Coverage</td> <td>0.0% Duplications</td> </tr> </tbody> </table>	A 0 Bugs	A 0 Vulnerabilities	E 0.0% Hotspots Reviewed	C 17 Code Smells	33.6% Coverage	0.0% Duplications
A 0 Bugs	A 0 Vulnerabilities	E 0.0% Hotspots Reviewed	C 17 Code Smells	33.6% Coverage	0.0% Duplications		

Ansicht Backend mit allen Infos	
Github Commit: Verweis Lernjournal X	
Neue Analyse	gradle sonar -Dsonar.projectKey=devopsdemo-backend - Dsonar.projectName='devopsdemo-backend' - Dsonar.host.url=http://localhost:9000 - Dsonar.token=sq...ecee7d3234c1c5f48c894f1f66a92ed9ccff6c07
Failed Fehler suchen	
Fehler Anpassen und neu commiten	
Frontend im SonarQube	npx sonar-scanner -Dsonar.host.url=http://localhost:9000 - Dsonar.projectKey=devopsdemo-frontend -Dsonar.projectName='devopsdemo-frontend' -Dsonar.token=sq...48b8d215e14ccb8cebe94193d4918695057c6ec47
Success	

<h3>Neue Analyse</h3>	<p><b>devopsdemo-backend PUBLIC</b></p> <p>Last analysis: 28 seconds ago · 388 Lines of Code · Java</p> <p><span style="color: green;">A</span> 0 Bugs   <span style="color: green;">A</span> 0 Vulnerabilities   <span style="color: red;">E</span> 0.0% Hotspots Reviewed   <span style="color: green;">A</span> 15 Code Smells   <span style="color: orange;">C</span> 33.6% Coverage   <span style="color: green;">D</span> 0.0% Duplications</p> <p><b>Measures</b></p> <p>New Code   Overall Code</p> <p>New Code: Since May 17, 2024 Started 47 minutes ago</p> <table border="1"> <tbody> <tr> <td><span style="color: green;">A</span> Reliability 0 New Bugs</td><td><span style="color: green;">A</span> Maintainability 0 New Code Smells</td></tr> <tr> <td><span style="color: green;">A</span> Security 0 New Vulnerabilities</td><td><span style="color: green;">A</span> Security Review 0 New Security Hotspots</td></tr> <tr> <td><span style="color: green;">C</span> Coverage <b>100% Coverage</b> Coverage on 2 New Lines to cover</td><td><span style="color: green;">D</span> Duplications 0.0% Duplications Duplications on 3 New Lines</td></tr> </tbody> </table>	<span style="color: green;">A</span> Reliability 0 New Bugs	<span style="color: green;">A</span> Maintainability 0 New Code Smells	<span style="color: green;">A</span> Security 0 New Vulnerabilities	<span style="color: green;">A</span> Security Review 0 New Security Hotspots	<span style="color: green;">C</span> Coverage <b>100% Coverage</b> Coverage on 2 New Lines to cover	<span style="color: green;">D</span> Duplications 0.0% Duplications Duplications on 3 New Lines
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<h3>Weitere Codeanpassungen und neue Analyse</h3>	<p><b>devopsdemo-backend PUBLIC</b></p> <p>Last analysis: 12 seconds ago · 388 Lines of Code · Java</p> <p><span style="color: green;">A</span> 0 Bugs   <span style="color: green;">A</span> 0 Vulnerabilities   <span style="color: red;">E</span> 0.0% Hotspots Reviewed   <span style="color: green;">A</span> 6 Code Smells   <span style="color: orange;">C</span> 33.6% Coverage   <span style="color: green;">D</span> 0.0% Duplications</p>						
	<p><b>devops-frontend / main</b> Version 0.0.1</p> <p>Overview Issues Security Hotspots Measures Code Activity Project Settings Project Information</p> <p>To benefit from more of SonarQube's features, set up analysis in your favorite CI.</p> <p><b>Quality Gate Status</b> Passed</p> <p><b>Measures</b></p> <p>New Code   Overall Code</p> <table border="1"> <tbody> <tr> <td><span style="color: orange;">C</span> Reliability 1 Bugs</td><td><span style="color: green;">A</span> Maintainability 14 Code Smells</td></tr> <tr> <td><span style="color: green;">A</span> Security 0 Vulnerabilities</td><td><span style="color: green;">A</span> Security Review 0 Security Hotspots</td></tr> <tr> <td><span style="color: red;">C</span> Coverage 0.0% Coverage Coverage on 53 Lines to cover - Unit Tests</td><td><span style="color: orange;">C</span> Duplications 11.3% Duplications Duplications on 542 Lines 2 Duplicated Blocks</td></tr> </tbody> </table> <p>Activity</p>	<span style="color: orange;">C</span> Reliability 1 Bugs	<span style="color: green;">A</span> Maintainability 14 Code Smells	<span style="color: green;">A</span> Security 0 Vulnerabilities	<span style="color: green;">A</span> Security Review 0 Security Hotspots	<span style="color: red;">C</span> Coverage 0.0% Coverage Coverage on 53 Lines to cover - Unit Tests	<span style="color: orange;">C</span> Duplications 11.3% Duplications Duplications on 542 Lines 2 Duplicated Blocks
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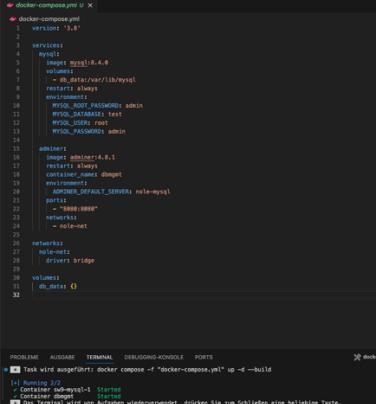
## 2.7 INTEGRATION TESTS

Person 1, Name/Kürzel	Nolevit1
Person 1, Repo URL	<a href="https://github.com/nolevit1/week8-int-test">https://github.com/nolevit1/week8-int-test</a>
Person 2, Name/Kürzel	Thayaagh
Person 2, Repo URL	<a href="https://github.com/thayaagh/Week8_IntegrationTests">https://github.com/thayaagh/Week8_IntegrationTests</a>
Grundgedanke	<a href="https://digitec.ch">https://digitec.ch</a> Suchfeld nutzen und Produkte suchen
Selenium starten und neues Projekt anlegen	
URL angeben auf denen die Aufnahme gestartet wird	
Test name definieren	
Maus und Tastatur wird aufgenommen während ich auf digitec.ch im Suchfeld nach sonos suche. Verify Text untersucht ob die Titelzeile «Sonos» lautet	
Verify Text hier überprüft ob die Titelzeile «Sonnnos» ist, wenn nicht wird der Test nicht abgebrochen sondern läuft weiter	
Beispiel wie es aussieht wenn Verify Text fehlschlägt	

<p>Beispiel wie es aussieht wenn Verify Text fehlschlägt, aber trotzdem weitermacht und als nächstes im Suchfeld nach JBL sucht</p>	 <p>The screenshot shows the Selenium IDE interface with a test case titled "Project: digitec.ch test*". The test steps are as follows:</p> <table border="1"> <thead> <tr> <th>Command</th> <th>Target</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>1 ✓ open</td><td>/</td><td></td></tr> <tr><td>2 ✓ set window size</td><td>1116x676</td><td></td></tr> <tr><td>3 ✓ click</td><td>id#q</td><td></td></tr> <tr><td>4 ✓ type</td><td>id#q</td><td>sonos</td></tr> <tr><td>5 ✓ send keys</td><td>id#q</td><td>\$!KEY_ENTER)</td></tr> <tr><td>6 ✘ assert text</td><td>css=.sc-f93c62dd-0</td><td>Sonnos</td></tr> <tr><td>7 ✓ double click</td><td>id#q</td><td></td></tr> <tr><td>8 ✓ type</td><td>id#q</td><td>jbl</td></tr> <tr><td>9 ✓ send keys</td><td>id#q</td><td>\$!KEY_ENTER)</td></tr> <tr><td>10 verify text</td><td>css=.sc-f93c62dd-0</td><td>JBL</td></tr> </tbody> </table> <p>The step "6 ✘ assert text" is highlighted in red, indicating a failure. The status bar at the bottom shows "Runs: 1 Failures: 1".</p>	Command	Target	Value	1 ✓ open	/		2 ✓ set window size	1116x676		3 ✓ click	id#q		4 ✓ type	id#q	sonos	5 ✓ send keys	id#q	\$!KEY_ENTER)	6 ✘ assert text	css=.sc-f93c62dd-0	Sonnos	7 ✓ double click	id#q		8 ✓ type	id#q	jbl	9 ✓ send keys	id#q	\$!KEY_ENTER)	10 verify text	css=.sc-f93c62dd-0	JBL
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<p>Änderung von Verify Text zu Assert Text. Wenn hier der Test fehlschlägt, was in diesem Fall geschieht, weil Sonnos falsch geschrieben ist, wird der gesamte Test abgebrochen.</p>	 <p>The screenshot shows the Selenium IDE interface with a test case titled "Project: digitec.ch test*". The test steps are as follows:</p> <table border="1"> <thead> <tr> <th>Command</th> <th>Target</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>1 ✓ open</td><td>/</td><td></td></tr> <tr><td>2 ✓ set window size</td><td>1116x676</td><td></td></tr> <tr><td>3 ✓ click</td><td>id#q</td><td></td></tr> <tr><td>4 ✓ type</td><td>id#q</td><td>sonos</td></tr> <tr><td>5 ✓ send keys</td><td>id#q</td><td>\$!KEY_ENTER)</td></tr> <tr><td>6 ✘ assert text</td><td>css=.sc-f93c62dd-0</td><td>Sonnos</td></tr> <tr><td>7 ✓ double click</td><td>id#q</td><td></td></tr> <tr><td>8 ✓ type</td><td>id#q</td><td>jbl</td></tr> <tr><td>9 ✓ send keys</td><td>id#q</td><td>\$!KEY_ENTER)</td></tr> <tr><td>10 verify text</td><td>css=.sc-f93c62dd-0</td><td>JBL</td></tr> </tbody> </table> <p>The step "6 ✘ assert text" is highlighted in red, indicating a failure. The status bar at the bottom shows "Runs: 1 Failures: 1".</p>	Command	Target	Value	1 ✓ open	/		2 ✓ set window size	1116x676		3 ✓ click	id#q		4 ✓ type	id#q	sonos	5 ✓ send keys	id#q	\$!KEY_ENTER)	6 ✘ assert text	css=.sc-f93c62dd-0	Sonnos	7 ✓ double click	id#q		8 ✓ type	id#q	jbl	9 ✓ send keys	id#q	\$!KEY_ENTER)	10 verify text	css=.sc-f93c62dd-0	JBL
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<p>Best practice Know-How Austausch mit Aghishenth</p>	<p>Aghishenth hat den Test mit Selenium mit einer Meteo und der Microsoft Seite getestet. Beide Optionen Verify Text und Assert Text wurden verwendet. Der negative Test etwas falsch anzugeben und dann zu testen ist von hoher Wichtigkeit, anstatt immer mit den richtigen Daten zu testen.</p> <p>Ausserdem habe ich weitere Selenium Tests für die PowerPoint/Video erstellt und ausführlich im Video beschrieben. Diese sind auch im Repo ersichtlich.</p>																																	

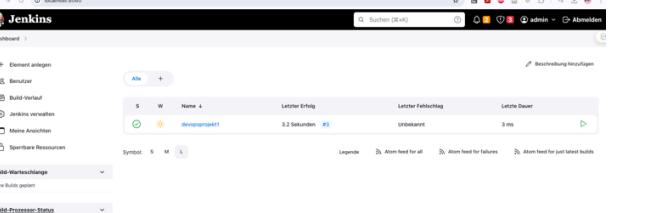
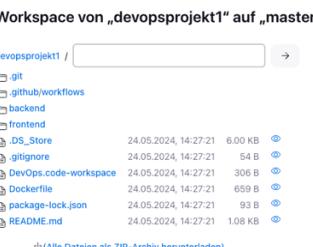
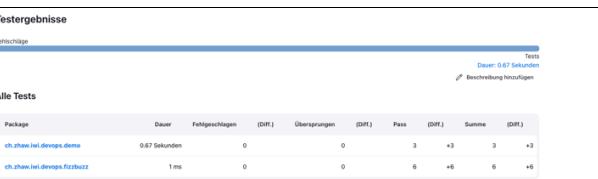
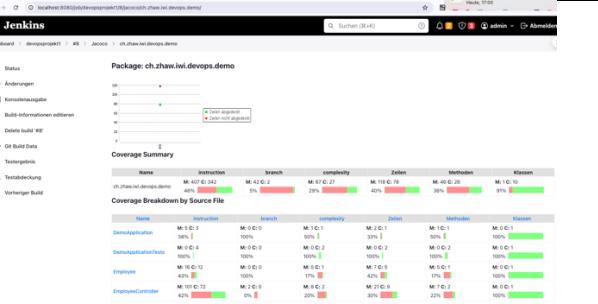
## 2.8 CONTAINERS

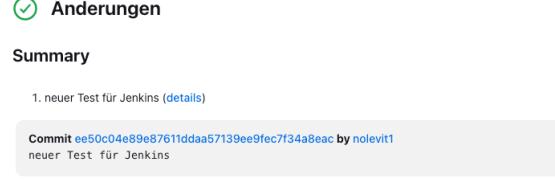
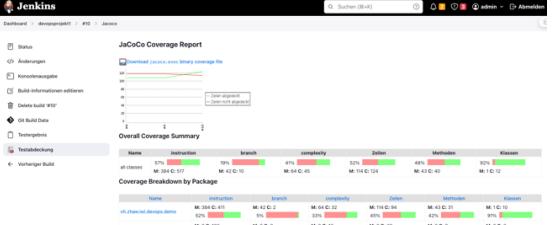
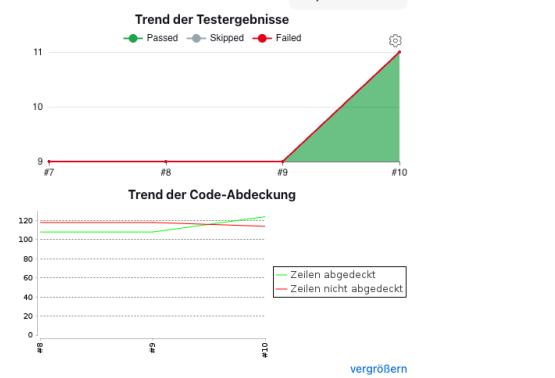
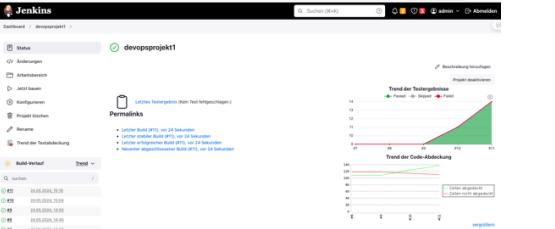
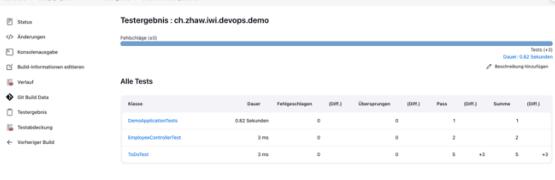
Voller Tag der verwendeten Images	<a href="https://github.com/nolevit1/sw9">https://github.com/nolevit1/sw9</a>																
Verwendetes Image 1: MySQL	INDEX DIGEST: sha256:4a4e5e2a19aab7a67870588952e8f401e17a330466ecfc55c9acf51196da5bd0 docker pull mysql:8.4.0-oracle																
Verwendetes Image 1: Adminer	INDEX DIGEST: sha256:cbbc8caedf029309ac7df72a470785e99a0942e29b3efc9367ee1640e1b330 docker pull adminer:4.8.1																
MySQL pull	<p><b>TAG</b> <b>8.4.0</b> Last pushed 14 days ago by <a href="#">dolancky</a></p> <table> <thead> <tr> <th>Digest</th> <th>OS/ARCH</th> <th>Vulnerabilities</th> <th>Compressed Size</th> </tr> </thead> <tbody> <tr> <td>e193c837211e</td> <td>linux/amd64</td> <td>2 31 13 1 6</td> <td>160.98 MB</td> </tr> <tr> <td>79bf5d05d420</td> <td>linux/arm64</td> <td>2 31 13 1 6</td> <td>158.25 MB</td> </tr> </tbody> </table> <pre>● (base) alessandrone@AirvonAssandro sw9 % docker pull mysql:8.4.0 8.4.0: Pulling from library/mysql 3cc065699099: Pull complete 6746d8c92d7ff: Pull complete 64e7eb221242: Pull complete f787785d518: Pull complete 7585e10d9b184: Pull complete c69999911c83: Pull complete 1142f05d9006: Pull complete d598a5053b5c: Pull complete 3de4462059cc: Pull complete cc926667410: Pull complete Digest: sha256:4a4e5e2a19aab7a67870588952e8f401e17a330466ecfc55c9acf51196da5bd0 Status: Downloaded newer image for mysql:8.4.0 docker.io/library/mysql:8.4.0</pre> <p><b>What's Next?</b> View a summary of image vulnerabilities and recommendations → <a href="#">docker scout quickview mysql:8.4.0</a></p>	Digest	OS/ARCH	Vulnerabilities	Compressed Size	e193c837211e	linux/amd64	2 31 13 1 6	160.98 MB	79bf5d05d420	linux/arm64	2 31 13 1 6	158.25 MB				
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2d7a0cd03490	linux/arm/v5	0 0 43 0	87.02 MB														
Setup von MySQL	<pre>● (base) alessandrone@AirvonAssandro sw9 % docker run --name note-mysql -e MYSQL_ROOT_PASSWORD=admin -d mysql:8.4.0 4ab6e08b02f13c887ab8cc28fb31cd6795dec352c8a484b2af9d0118cd036 ● (base) alessandrone@AirvonAssandro sw9 %</pre>																
Docker Desktop																	
Adminer setup	<pre>● (base) alessandrone@AirvonAssandro sw9 % docker run -d --name dbmgmt --ADMINER_DEFAULT_SERVER=note-mysql -p 8080:8080 adminer:4.8.1 5940d54b5251e6c2ef49556bbfbfe3a81e6d0813ae4ba5be06cbd171028bb ● (base) alessandrone@AirvonAssandro sw9 %</pre>																
Docker Network note-net erstellt wo beide Container hinzugefügt werden	<pre>● (base) alessandrone@AirvonAssandro sw9 % docker network create note-net da5a07e3ce15b26b799911028606e23b81117c048f1500b9caa58b31d6073e9 ● (base) alessandrone@AirvonAssandro sw9 % docker network connect note-net note-mysql ● (base) alessandrone@AirvonAssandro sw9 % docker network connect note-net dbmgmt ● (base) alessandrone@AirvonAssandro sw9 %</pre>																
Wie das Netzwerk im Docker Desktop aussieht																	
Öffnen und testen von Adminer mit der MySQL Datenbank	Anmeldung (PW: admin)																

	
Auch das Erstellen neuer Datenbanken ist über die Adminer Oberfläche verfügbar	
Alle Datenbanken sind ersichtlich	
Erstellung von Tabellen und deren Attributen	
Docker Compose vereinfacht die Konfiguration mehrerer Container. Anstatt jeden Container einzeln zu starten und zu konfigurieren, können alle relevanten Informationen in einer zentralen Datei speichern und die Container dann mit einem einzigen Befehl starten	

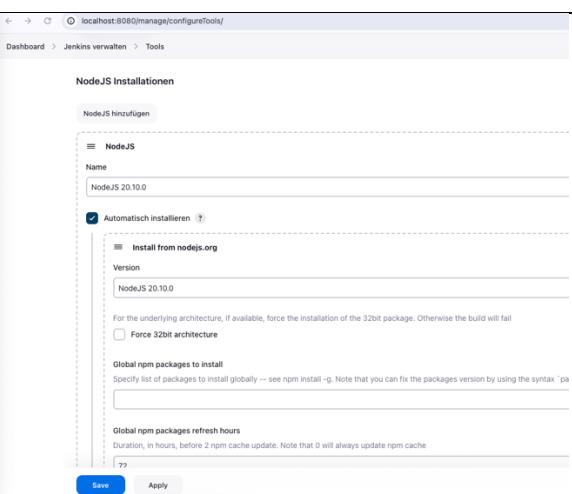
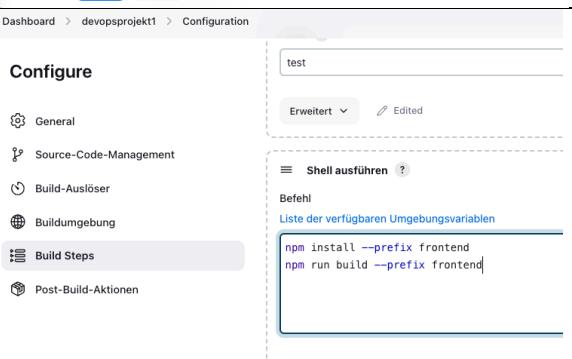
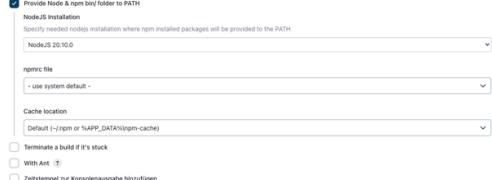
Wie das Netzwerk im Docker Desktop aussieht	
---	---

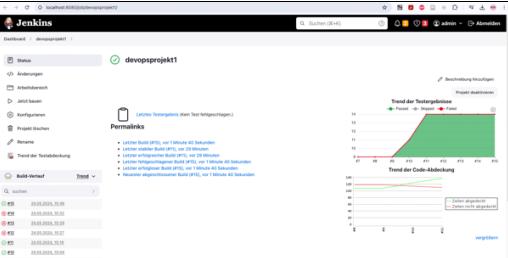
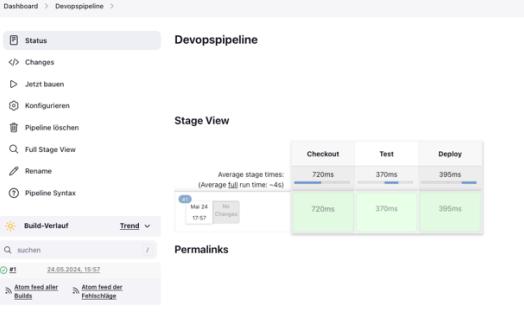
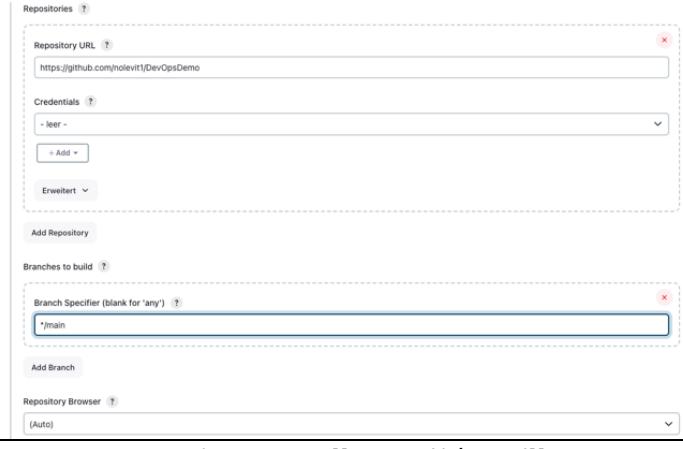
## 2.9 CONTINUOUS INTEGRATION ½

Repo URL (Fork)	<a href="https://github.com/nolevit1/DevOpsDemo">https://github.com/nolevit1/DevOpsDemo</a>
Jenkins Container starten	
Element angelegt und devopsprojekt1 genannt	
Github Repo für die Tests angeben	
Ansicht der Files die auch im Repo verfügbar sind	
Gradle build erfolgreich	
Testergebnisse	
Dashboard	

<p>Anpassung der Tests mit neuen Tests die Committed wurden</p>	 <p>Commit ee50c04e89e87611ddaa57139ee9fec7f34a8ec by nolevit neuer Test für Jenkins</p> <ul style="list-style-type: none"> <li><a href="#">backend/src/test/java/ch/zhaw/iwi/devops/demo/ToDoTest.java (diff)</a></li> <li><a href="#">backend/src/test/java/ch/zhaw/iwi/devops/demo/ToDoControllerTest.java (diff)</a></li> </ul>																																										
<p>Dashboard passt sich an (siehe Graphen)</p>	 <p>JaCoCo Coverage Report</p> <p>Overall Coverage Summary</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Instruction</th> <th>branch</th> <th>complexity</th> <th>Zellen</th> <th>Methode</th> <th>Klassen</th> </tr> </thead> <tbody> <tr> <td>all classes</td> <td>57%</td> <td>19%</td> <td>41%</td> <td>52%</td> <td>48%</td> <td>52%</td> </tr> <tr> <td>MI-Backend-Service</td> <td>57%</td> <td>19%</td> <td>41%</td> <td>52%</td> <td>48%</td> <td>52%</td> </tr> </tbody> </table> <p>Coverage Breakdown by Package</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Instruction</th> <th>branch</th> <th>complexity</th> <th>Zellen</th> <th>Methode</th> <th>Klassen</th> </tr> </thead> <tbody> <tr> <td>ch.zhaw.iwi.devops.demo</td> <td>57%</td> <td>19%</td> <td>41%</td> <td>52%</td> <td>48%</td> <td>52%</td> </tr> <tr> <td>ch.zhaw.iwi.devops.frontend</td> <td>100%</td> <td>100%</td> <td>100%</td> <td>100%</td> <td>100%</td> <td>100%</td> </tr> </tbody> </table>	Name	Instruction	branch	complexity	Zellen	Methode	Klassen	all classes	57%	19%	41%	52%	48%	52%	MI-Backend-Service	57%	19%	41%	52%	48%	52%	Name	Instruction	branch	complexity	Zellen	Methode	Klassen	ch.zhaw.iwi.devops.demo	57%	19%	41%	52%	48%	52%	ch.zhaw.iwi.devops.frontend	100%	100%	100%	100%	100%	100%
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ch.zhaw.iwi.devops.frontend	100%	100%	100%	100%	100%	100%																																					
<p>Nach dem committed zusätzlicher Tests</p>	 <p>Trend der Testergebnisse</p> <p>Trend der Code-Abdeckung</p> <p>vergrößern</p>																																										
<p>Dashboard</p>	 <p>Permaniks</p> <p>Letztes Testergebnis: (nein Test-fertig/abgeschlossen)</p> <p>Projekt aktualisieren</p> <p>Trend der Testergebnisse</p> <p>Trend der Code-Abdeckung</p>																																										
<p>Testergebnisse</p>	 <p>Alle Tests</p> <table border="1"> <thead> <tr> <th>Klasse</th> <th>Dauer</th> <th>Fehlerprotokoll (DE)</th> <th>Startsprünge (DE)</th> <th>Pass (DE)</th> <th>Summe (DE)</th> </tr> </thead> <tbody> <tr> <td>DemografikControllerTest</td> <td>0,02 Sekunden</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>EmployeeControllerTest</td> <td>3 ms</td> <td>0</td> <td>0</td> <td>2</td> <td>2</td> </tr> <tr> <td>TotalTest</td> <td>2 ms</td> <td>0</td> <td>0</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Klasse	Dauer	Fehlerprotokoll (DE)	Startsprünge (DE)	Pass (DE)	Summe (DE)	DemografikControllerTest	0,02 Sekunden	0	0	1	1	EmployeeControllerTest	3 ms	0	0	2	2	TotalTest	2 ms	0	0	3	3																		
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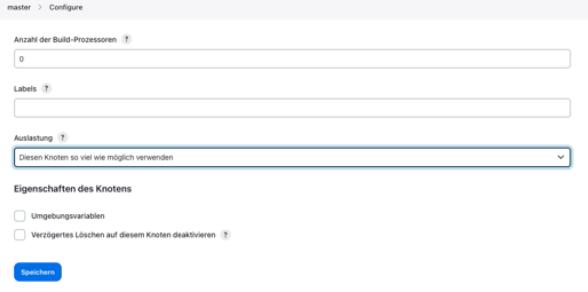
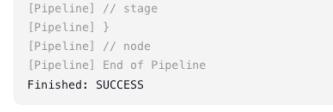
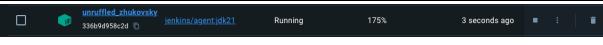
## 2.10 CONTINUOUS INTEGRATION 2/2

Repo URLs	<a href="https://github.com/nolevit1/DevOpsDemo">https://github.com/nolevit1/DevOpsDemo</a>
Überprüfung ob NodeJS Plugin installiert ist	
Node JS Version angeben für die Installation	
NPM installation	
Build erfolgreich	
Überprüfung von NPM	
Fehlersuche	

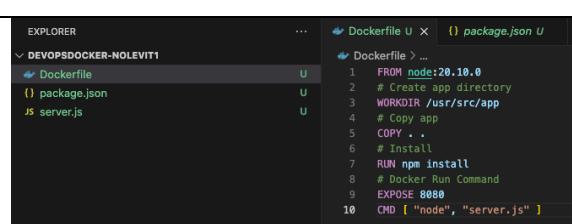
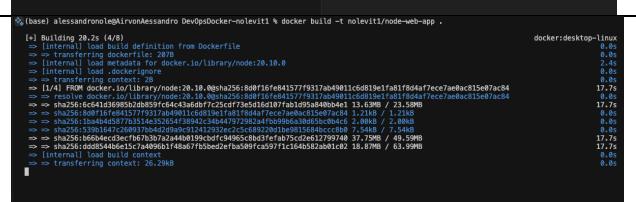
NPM Fehlersuche	
Funktioniert wieder	
Pipeline erstellen mit dem Namen Devopspipeline	
Konfiguration	
Konfiguration	checkout scmGit(branches: [[name: '/main']], extensions: [], userRemoteConfigs: [[url: 'https://github.com/nolevit1/DevOpsDemo']])
Konfiguration	

<h3>Jetzt bauen Status</h3>	
<h3>Workspace kontrollieren</h3>	
<h3>Jenkinsfile erstellt (ohne Dateiendung) und ins Git Repo gepusht</h3>	<pre> Jenkinsfile U x DevOpsDemo &gt; Jenkinsfile 1 pipeline { 2   agent any 3   stages { 4     stage('Checkout') { 5       steps { 6         sh 'echo checkout' 7         checkout scmGit(branches: [[name: '#/main']], extensions: [], userRemoteConfigs: [[url: 'https://github.com/nolevit1/DevOpsDemo.git']]) 8       } 9     } 10    stage('Test') { 11      steps { 12        sh 'echo test' 13      } 14    } 15    stage('Deploy') { 16      steps { 17        sh 'echo deploy' 18      } 19    } 20  } 21 } </pre>
<h3>Konfiguration Pipeline anpassen</h3>	

Jetzt bauen Status	<p>The screenshot shows the Jenkins Devopspipeline status page. It includes a sidebar with options like Status, Changes, Jetzt bauen, Konfigurieren, Pipeline löschen, Full Stage View, Rename, and Pipeline Syntax. The main area features a Stage View with four stages: Declarative: SCM (5s), Checkout (1s), Test (319ms), and Deploy (311ms). Below this is a Build-Verlauf section with a trend graph and a table of recent builds. A Permalinks section lists the last few builds.</p>
Jenkins Cloud Agent erstellen	<p>The screenshot shows the Jenkins 'New cloud' configuration page for Docker. It has fields for Cloud name (Docker) and Type (Docker). A 'Create' button is at the bottom.</p>
Socat für die Kommunikation pullen	<pre>((base) alessandronole@AirvonAlessandro ~ % docker pull alpine/socat Using default tag: latest latest: Pulling from alpine/socat bca4290a9639: Pull complete c419eaecdb58: Pull complete Digest: sha256:4245534158bb1bd3990334730d1778fac713115e8d97bfaa05534df169b4ea6c Status: Downloaded newer image for alpine/socat:latest docker.io/alpine/socat:latest</pre> <p><b>What's Next?</b> View a summary of image vulnerabilities and recommendations → <a href="#">docker scout quickview alpine/socat</a></p>
Socat Konfigurieren	<pre>((base) alessandronole@AirvonAlessandro ~ % docker run -d --restart=always --name socat3 -p 127.0.0.1:2376:2376 -v /var/run/docker.sock:/var/run/docker.sock alpine/socat tcp-listen:2375,fork,reuseaddr,unix-connect:/var/run/docker.sock 17b942abba4c83ef71a161a03363932c51393a17d54d839c3543009753547ab7 (base) alessandronole@AirvonAlessandro ~ %</pre>
IP ausfindig machen	<p>Docker inspect socat2</p> <p>IP: 172.17.0.3</p>
IP für Jenkins Cloud einrichten	<p>The screenshot shows the Jenkins 'New cloud' configuration page for Docker. It has fields for Name (Docker), Docker Host URI (tcp://172.17.0.3:2375), Server credentials (empty), and Enabled (checked). A 'Test Connection' button is at the top right.</p>
Konfiguration	<p>The screenshot shows the Jenkins Docker Agent template configuration page. It includes fields for Labels, Enabled (checked), Name (Jenkins Agent), and Docker Image (jenkins/agent:dk21).</p>

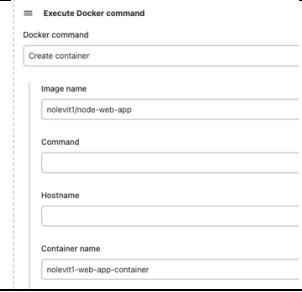
Konfiguration	
Läuft	
Erfolgreich	
Docker	

## 2.11 DOCKER DEPLOYMENT

Repo URLs	<a href="https://github.com/nolevit1/DevOpsDocker-nolevit1">https://github.com/nolevit1/DevOpsDocker-nolevit1</a>
Repo forken und lokal pullen	
Docker Build	
Docker run	

<p>Jenkins Container starten und neues Element erstellen</p>	
<p>Beim Source Code Management mein Git Repo angeben</p>	
<p>Build erfolgreich</p>	
<p>Workspace kontrollieren</p>	
<p>NodeJS Konfigurieren</p>	
<p>Erfolgreich</p>	

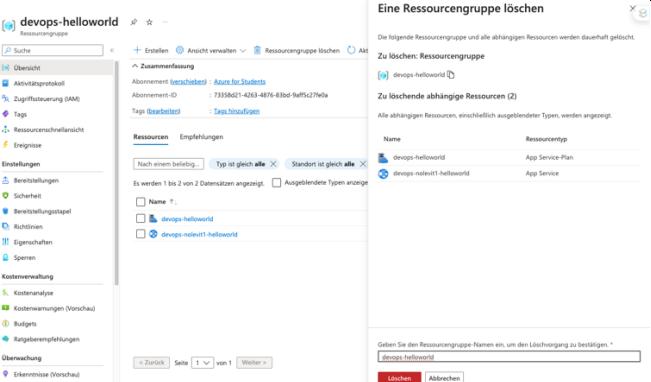
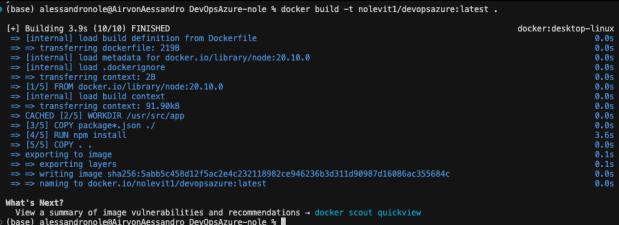
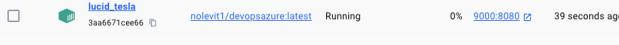
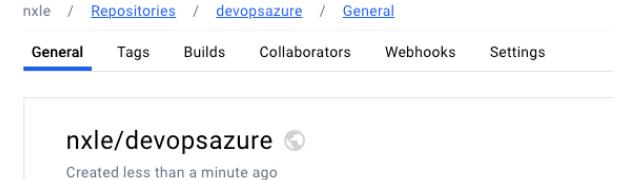
Docker einrichten	<p><b>Docker Builder</b></p> <p>Docker URL <a href="#">?</a> Docker server REST API URL tcp://172.17.0.3:2375</p> <p>Erweitert ▾</p> <p>Connected to tcp://172.17.0.3:2375</p>
Docker Image Konfiguration	<p>≡ Execute Docker command</p> <p>Docker command</p> <p>Create/build image</p> <p>Build context folder</p> <p>\$WORKSPACE</p> <p>Tag of the resulting docker image</p> <p>nolevit1/node-web-app</p> <p>Erweitert ▾</p>
Build erfolgreich	<pre>[Docker] INFO: ---&gt; Running in b3c1ce5766d3 [Docker] INFO: ---&gt; ee14570aafc5 [Docker] INFO: Successfully built ee14570aafc5 [Docker] INFO: Successfully tagged nolevit1/node-web-app:latest [Docker] INFO: Build image id:ee14570aafc5 Finished: SUCCESS</pre>
Build Konfiguration	<p>Build-Auslöser</p> <p><input type="checkbox"/> Builds von außerhalb starten (z.B. skriptgesteuert) <a href="#">?</a></p> <p><input checked="" type="checkbox"/> Starte Build, nachdem andere Projekte gebaut wurden <a href="#">?</a> Zu überwachende Projekte DevOpsDockerBuild,</p> <p><input checked="" type="radio"/> Nur auslösen, wenn der Build stabil ist</p> <p><input type="radio"/> Auslösen, selbst wenn der Build instabil ist</p> <p><input type="radio"/> Auslösen, selbst wenn der Build fehlschlägt</p> <p><input type="radio"/> Always trigger, even if the build is aborted</p> <p><input type="checkbox"/> Builds zeitgesteuert starten <a href="#">?</a></p> <p><input type="checkbox"/> GitHub hook trigger for GITScm polling <a href="#">?</a></p> <p><input type="checkbox"/> Source Code Management System abrufen <a href="#">?</a></p>
Container Konfiguration - Remove	<p>Build Steps</p> <p>≡ Execute Docker command</p> <p>Docker command</p> <p>Remove container(s)</p> <p>Container ID(s) Comma separated list of containers to be removed. nolevit1-web-app-container</p> <p>Erweitert ▾</p>
Status	<p>Dashboard &gt; DevOpsDockerDeploy &gt; #4 Konsolausgabe</p> <p>Status <a href="#">?</a> Änderungen <a href="#">?</a> Konsolausgabe <a href="#">?</a> Als unformatierten Text anzeigen <a href="#">?</a> Build-informationen editieren <a href="#">?</a> Delete build #4# <a href="#">?</a> ← Vorheriger Build</p> <p>Konsolausgabe</p> <p>Started by user admin Running on master Building in workspace /var/jenkins_home/workspace/DevOpsDockerDeploy [Docker] INFO: container 'nolevit1-web-app-container' not found, but skipping this error is turned on, let's continue ... Finished: SUCCESS</p>

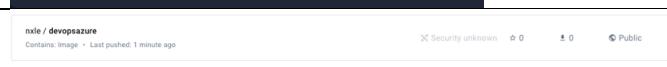
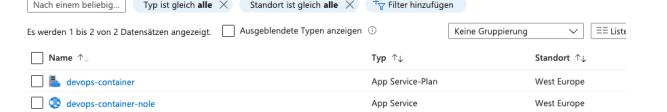
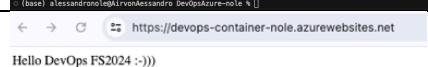
Docker Konfiguration - Create																															
Fehler behoben, IP geändert und erfolgreich getestet	<p>Über nacht hat sich die IP Adresse geändert</p> <pre>[Docker] ERROR: Failed to exec start:org.apache.hc.client5.http.HttpHostConnectException: Connect to http://172.17.0.3:2375 [/172.17.0.3] failed: Connection refused [Docker] ERROR: Failed to create docker image: org.apache.hc.client5.http.HttpHostConnectException: Connect to http://172.17.0.3:2375 [/172.17.0.3] failed: Connection refused ERROR: Build step failed with exception</pre> <p><b>Docker Builder</b></p> <p>Docker URL ?</p> <p>Docker server REST API URL</p> <p>tcp://172.17.0.2:2375</p> <p>Erweitert ▾</p> <p>Connected to tcp://172.17.0.2:2375</p>																														
Neuer erfolgreicher Status	<p>✓ #15      25.05.2024, 07:57</p> <p>✗ #14      25.05.2024, 07:53</p>																														
Docker Image	<p>Images <small>Give feedback</small></p> <p>Local Hub</p> <p>5.31 GB / 3.03 GB in use 14 images Last refresh: 22 hours ago</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Tag</th> <th>Status</th> <th>Created</th> <th>Size</th> <th>Actions</th> </tr> </thead> <tbody> <tr> <td>nolevit1/node-web-app</td> <td>latest</td> <td>Unused</td> <td>1 second ago</td> <td>1.1 GB</td> <td>...</td> </tr> <tr> <td>zabodev0080</td> <td></td> <td></td> <td></td> <td></td> <td>...</td> </tr> <tr> <td>nolevit1_web_app_csr</td> <td>nolevit1_web_app:latest</td> <td>Running</td> <td>0% 9000:8080</td> <td>12 seconds ago</td> <td>...</td> </tr> <tr> <td>7016412d20ed</td> <td></td> <td></td> <td></td> <td></td> <td>...</td> </tr> </tbody> </table>	Name	Tag	Status	Created	Size	Actions	nolevit1/node-web-app	latest	Unused	1 second ago	1.1 GB	...	zabodev0080					...	nolevit1_web_app_csr	nolevit1_web_app:latest	Running	0% 9000:8080	12 seconds ago	...	7016412d20ed					...
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nolevit1/node-web-app	latest	Unused	1 second ago	1.1 GB	...																										
zabodev0080					...																										
nolevit1_web_app_csr	nolevit1_web_app:latest	Running	0% 9000:8080	12 seconds ago	...																										
7016412d20ed					...																										
Docker Container	<p>Applikation test analog zum Git Repo Code</p> <p>localhost:9000</p> <p>Hello FS2024 DevOps Course! :-) I am a Node.js app running in a nice Docker container.</p>																														
Anpassungen gepusht und im Jenkins neu ausgeführt	<p>QUELLECODEVERWALTUNG</p> <p>Nachricht (Blätter für "main" commiten)</p> <p>✓ Commit</p> <p>server.js</p> <pre>&gt; server.js &gt; express() callback   'use strict';   2 const express = require('express');   3 // Constants   4 const PORT = 8080;   5 const HOST = '0.0.0.0';   6 // App   7 const app = express();   8 app.get('/', (req, res) =&gt; {   9   res.send('Hello FS2024 DevOps Course! :-) I am a Node.js app running in a nice Docker container. :-)');  10 });  11 app.listen(PORT, HOST);  12 console.log(`Running on http://\${HOST}:\${PORT}`);</pre>																														
Resultat mit neuem Smile am Ende	<p>localhost:9000</p> <p>Hello FS2024 DevOps Course! :-) I am a Node.js app running in a nice Docker container. ;-)</p>																														

## 2.12 CLOUD DEPLOYMENT

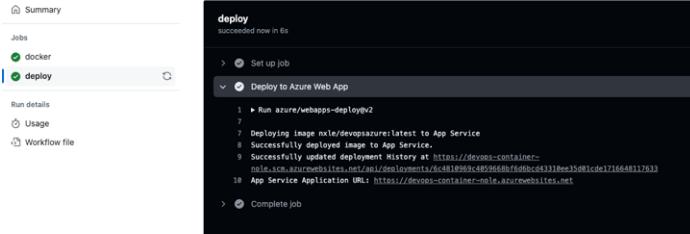
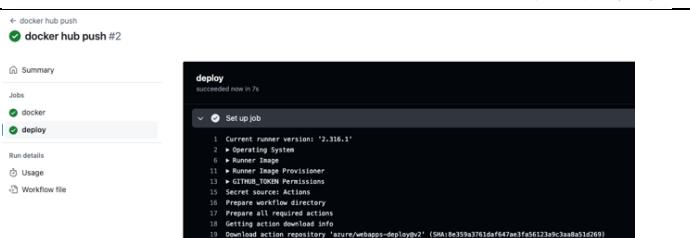
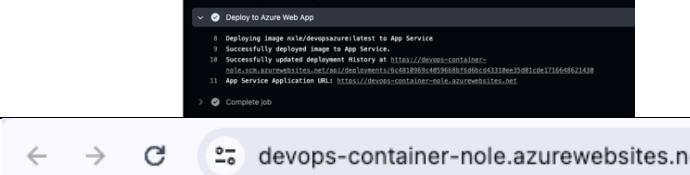
Repo URLs	<a href="https://github.com/nolevit1/DevOpsAzure-nole">https://github.com/nolevit1/DevOpsAzure-nole</a>
Docker Hub URLs	<a href="https://hub.docker.com/repository/docker/nxle/devopsazure/general">https://hub.docker.com/repository/docker/nxle/devopsazure/general</a>
Login Azure über VS Code	<p>localhost:53225/?code=0.AYIAz8aXR8gEEq5g0Uc9ly8Hpv3sATbjRpGu-4C-eG_eC</p> <p>You have logged into Microsoft Azure!</p> <p>You can close this window, or we will redirect you to the <a href="#">Azure CLI documentation</a> in 1 minute.</p>

<h3>Student Subscription als Standard setzen</h3>	<pre>Your CLI is up-to-date. (base) alessandrone@AirvonAlessandro DevOpsAzure-note % az login A browser window has been opened at https://login.microsoftonline.com/organizations/oauth2/v2.0/authorize. Please continue the log in in the web browser. If no web browser is available or if the web browser fails to open, use device code flow with az login --use-device-code.  Retrieving tenants and subscriptions for the selection... Authentication failed against tenant b1bd2d5e-0be6-4a52-904a-081b78549947 'Zurich UAS Racing': AA0STSS0076: Due to a configuration change made by your administrator, or because you moved to a new location, you must use multi-factor authentication to access '979f4846-ba00-4fd7-ba43-dac1f8f63b13'. Trace ID: 3afcb89c-3d45-473f-b42e-d698c2095b00 Correlation ID: d5a3f5ac-f8b1-41d0-9aad-04e8eaeb494 Timestamp: 2024-05-25T10:54:28Z If you encounter any problem, please use 'az login' in the following tenants, please use 'az login --tenant TENANT_ID'. b1bd2d5e-0be6-4a52-904a-081b78549947 'Zurich UAS Racing'  [Tenant and subscription selection] No Subscription name Subscription ID Tenant [1] Azure for Students 73358d21-4263-4876-83bd-9aff5c27fe0a ZHAW [2] * p-v-wvd-sub a32b0911-e2e1-4ba4-bfa8-221332eee287 ZHAW The default is marked with an *; the default tenant is 'ZHAW' and subscription is 'p-v-wvd-sub' (a32b0911-e2e1-4ba4-bfa8-221332eee287). Select a subscription and tenant (Type a number or Enter for no changes): </pre>																					
	<pre>Select a subscription and tenant (Type a number or Enter for no changes): 1 Tenant: ZHAW Subscription: Azure for Students (73358d21-4263-4876-83bd-9aff5c27fe0a)  [Announcements] With the new Azure Cloud Shell, you can now link it to the subscription you want to use more easily. Learn more about it and its configuration at <a href="https://go.microsoft.com/fwlink/?linkid=2271236">https://go.microsoft.com/fwlink/?linkid=2271236</a>  If you encounter any problem, please open an issue at <a href="https://aka.ms/azclibug">https://aka.ms/azclibug</a>  [Warning] The login output has been updated. Please be aware that it no longer displays the full list of available subscriptions by default.</pre>																					
<h3>Ressourcengruppen erstellen</h3>	<pre>(base) alessandrone@AirvonAlessandro DevOpsAzure-note % az group create --name devops-helloworld --location switzerlandnorth {   "id": "/subscriptions/73358d21-4263-4876-83bd-9aff5c27fe0a/resourceGroups/devops-helloworld",   "location": "switzerlandnorth",   "managedBy": null,   "name": "devops-helloworld",   "properties": {     "provisioningState": "Succeeded"   },   "tags": null,   "type": "Microsoft.Resources/resourceGroups" } (base) alessandrone@AirvonAlessandro DevOpsAzure-note % </pre>																					
<h3>Kontrolle</h3>	<h3>Ressourcengruppen</h3> <p>Nach einem beliebigen Abonnement ist gleich alle Standort</p> <p>Es werden 1 bis von 1 Datensätzen angezeigt.</p> <p>Name: devops-helloworld</p>																					
	<pre>Creating zip with contents of dir /Users/alessandrone/Documents/devops/DevOpsAzure-note ... Getting scm site credentials for zip deployment Starting zip deployment. This operation can take a while to complete ... Deployment endpoint responded with status code 202 Polling for deployment status. Last update: 2024-05-25 09:03:59.819582+00:00 UTC Status: Received build request... Time: 0(s) Status: Received build request... Time: 17(s) Status: Build successful. Time: 32(s) Status: Publishing the site... Time: 6(s) Status: Starting the site... Time: 6(s) Status: Site started successfully. Time: 79(s) You can launch the app at http://devops-nolevit1-helloworld.azurewebsites.net Setting up 'az webapp up' default arguments for current directory. Manage defaults with 'az configure --scope local' --resource-group default: devops-helloworld --sku default: F1 --plan/-p default: devops-helloworld --location/-l default: switzerlandnorth --name/-n default: devops-nolevit1-helloworld {   "URL": "http://devops-nolevit1-helloworld.azurewebsites.net",   "appServicePlan": "devops-helloworld",   "location": "switzerlandnorth",   "name": "devops-nolevit1-helloworld",   "os": "Linux",   "resourceGroup": "devops-helloworld",   "runtime": "NODE:20-16",   "runtimeVersion": "2024-05-28-16",   "runtimeVersionDetected": "-",   "sku": "FREE",   "srcPath": "/Users//alessandrone/Documents/devops/DevOpsAzure-note" } (base) alessandrone@AirvonAlessandro DevOpsAzure-note % </pre>																					
<h3>Web-App Funktioniert über Azure</h3>	<p>← → ⌂ devops-nolevit1-helloworld.azurewebsites.net</p> <p>Hello DevOps FS2024 :-)))</p>																					
<h3>Web-App in der Azure Übersicht</h3>	<p>Microsoft Azure</p> <p>Home &gt; devops-helloworld &gt;</p> <p>devops-nolevit1-helloworld</p> <p>Web App</p> <table border="1"> <thead> <tr> <th>Übersicht</th> <th>Zusammenfassung</th> <th>Standarddomäne</th> </tr> </thead> <tbody> <tr> <td>Aktivitätsprotokoll</td> <td>Resourcengruppe: devops-helloworld</td> <td>: devops-nolevit1-helloworld.azurewebsites.net</td> </tr> <tr> <td>Zugriffsteuerung (IAM)</td> <td>Status: Wird ausgeführt</td> <td>App Services-Plan: devops-helloworld (F1: 1)</td> </tr> <tr> <td>Tags</td> <td>Speicherort (verschieben): Switzerland North</td> <td>Betriebssystem: Linux</td> </tr> <tr> <td>Diagnose und Problembehandlung</td> <td>Abonnement (verschieben): Azure for Students</td> <td>Integritätsprüfung: Nicht konfiguriert</td> </tr> <tr> <td>Microsoft Defender for Cloud</td> <td>Abonnement-ID: 73358d21-4263-4876-83bd-9aff5c27fe0a</td> <td></td> </tr> <tr> <td>Eminente Ressourcen</td> <td>Tags (verschieben): Tag hinzufügen</td> <td></td> </tr> </tbody> </table>	Übersicht	Zusammenfassung	Standarddomäne	Aktivitätsprotokoll	Resourcengruppe: devops-helloworld	: devops-nolevit1-helloworld.azurewebsites.net	Zugriffsteuerung (IAM)	Status: Wird ausgeführt	App Services-Plan: devops-helloworld (F1: 1)	Tags	Speicherort (verschieben): Switzerland North	Betriebssystem: Linux	Diagnose und Problembehandlung	Abonnement (verschieben): Azure for Students	Integritätsprüfung: Nicht konfiguriert	Microsoft Defender for Cloud	Abonnement-ID: 73358d21-4263-4876-83bd-9aff5c27fe0a		Eminente Ressourcen	Tags (verschieben): Tag hinzufügen	
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Eminente Ressourcen	Tags (verschieben): Tag hinzufügen																					

Ressourcengruppe löschen	
Image bauen mit Docker Build	
Docker run	
Docker Desktop	
Lokale Webapp funktioniert	
Docker Hub Repo	
Image ins Docker Hub pushen. Komischerweise trotz guter Internetverbindung ... könnte zwar immer besser sein aber in diesem Fall ausreichend 😊	Drei Versuche docker zu pushen

	<pre>(base) alessandrone@AirvonAlessandro DevOpsAzure-note % docker push nxle/devopsazure:latest The push refers to repository [docker.io/nxle/devopsazure] cc03244128d7: Pushed 4588e13682df: Pushed 2258c6bb3a0b: Pushed 0d929f3b7875: Pushed a1c1f92af495: Pushed b1d0d64f41a9: Pushed 3817e7e508ad: Retrying in 1 second c704ecc3cc92: Retrying in 1 second a084ff13e3e2: Pushing [=====] 160.1MB/160.1MB 3817e7e508ad: Pushed 77c68c878a75: Retrying in 1 second 3fc8314e8bdc: Pushing [=====] 97.5MB/138.8MB nxle/devopsazure:latest: Retrying in 1 second context deadline exceeded (Client.Timeout exceeded while awaiting headers) (base) alessandrone@AirvonAlessandro DevOpsAzure-note % docker push nxle/devopsazure:latest The push refers to repository [docker.io/nxle/devopsazure] cc03244128d7: Layer already exists 4588e13682df: Layer already exists 2258c6bb3a0b: Layer already exists 0d929f3b7875: Layer already exists a1c1f92af495: Layer already exists b1d0d64f41a9: Layer already exists 3817e7e508ad: Retrying in 1 second c704ecc3cc92: Pushed 3817e7e508ad: Pushing [=====] 121.0MB/559.8MB 77c68c878a75: Retrying in 1 second 3fc8314e8bdc: Pushing [=====] 45.86MB/138.8MB context deadline exceeded (Client.Timeout exceeded while awaiting headers) (base) alessandrone@AirvonAlessandro DevOpsAzure-note % docker push nxle/devopsazure:latest The push refers to repository [docker.io/nxle/devopsazure] cc03244128d7: Layer already exists 4588e13682df: Layer already exists 2258c6bb3a0b: Layer already exists 0d929f3b7875: Layer already exists a1c1f92af495: Layer already exists b1d0d64f41a9: Layer already exists 3817e7e508ad: Pushed c704ecc3cc92: Layer already exists a084ff13e3e2: Pushed 3817e7e508ad: Pushed 77c68c878a75: Pushed 3fc8314e8bdc: Pushed latest: digest: sha256:8cb3685268801a79hb5b242ef9fb2b0a1a540cc670654d4b3f60 size: 2839 (base) alessandrone@AirvonAlessandro DevOpsAzure-note % [</pre> 
Docker Hub Image	
Neue Ressourcengruppe	<pre>(base) alessandrone@AirvonAlessandro DevOpsAzure-note % az group create --name devops-container --location westeurope {   "id": "/subscriptions/3338d21-4263-4876-83bd-9aff5c27fe0a/resourceGroups/devops-container",   "location": "westeurope",   "managedBy": null,   "name": "devops-container",   "properties": {     "provisioningState": "Succeeded"   },   "tags": null,   "type": "Microsoft.Resources/resourceGroups" } (base) alessandrone@AirvonAlessandro DevOpsAzure-note % [</pre>
Neuer Service Plan	<pre>(base) alessandrone@AirvonAlessandro DevOpsAzure-note % az webapp create --resource-group devops-container --plan devops-container --name devops-container-role --deployment-container-image-name nxle/devopsazure:latest</pre>
Kontrolle im Azure Dashboard	
Neue Web-app	<pre>(base) alessandrone@AirvonAlessandro DevOpsAzure-note % az webapp config appsettings set --resource-group devops-container --name devops-container-role --settings WEBSITES_PORT=8080 App settings have been reduced. Use 'az webapp/logicapp/functionapp config appsettings list' to view. [{"name": "DOCKER_REGISTRY_SERVER_URL", "slotSetting": false, "value": null}, {"name": "DOCKER_REGISTRY_SERVER_USERNAME", "slotSetting": false, "value": null}, {"name": "DOCKER_REGISTRY_SERVER_PASSWORD", "slotSetting": false, "value": null}, {"name": "WEBSITES_ENABLE_APP_SERVICE_STORAGE", "slotSetting": false, "value": null}, {"name": "WEBSITES_PORT", "slotSetting": false, "value": null}] (base) alessandrone@AirvonAlessandro DevOpsAzure-note % [</pre>
Azure Webapp Funktioniert	 <p>Hello DevOps FS2024 :-))</p>

<b>YML anpassungen für die Github Actions</b>	<pre> Dockerfile    ! docker-image.yml M .github &gt; workflows &gt; ! docker-image.yml 1  name: docker hub push 2  on: 3    workflow_dispatch: 4    pushes: 5      branches: 6        - 'main' 7 8  jobs: 9    docker: 10   docker: 11     runs-on: ubuntu-latest 12   steps: 13     - name: Set up QEMU 14       uses: docker/setup-qemu-action@v2 15     - name: Set up Docker Buildx 16       uses: docker/setup-buildx-action@v2 17     - name: Login to Docker Hub 18       uses: docker/login-action@v2 19       with: 20         username: \${secrets.DOCKERHUB_USERNAME} 21         password: \${secrets.DOCKERHUB_TOKEN} 22     - name: Build and push 23       uses: docker/build-push-action@v3 24       with: 25         app-name: \${env.AZURE_WEBAPP_NAME} 26         publish-profile: \${secrets.AZURE_WEBAPP_PUBLISH_PROFILE} 27         images: 'nxle/devopsazure:latest' 28 29   deploy: 30     permissions: 31     contents: none 32     runs-on: ubuntu-latest 33     needs: docker 34   steps: 35     - name: Deploy to Azure Web App 36       id: deploy-to-webapp 37       uses: azure/webapps-deploy@v2 38       with: 39         app-name: \${env.AZURE_WEBAPP_NAME} 40         publish-profile: \${secrets.AZURE_WEBAPP_PUBLISH_PROFILE} 41         images: 'nxle/devopsazure:latest' 42 43 44 45 46 </pre>																
<b>Github Einstellungen für die Sicherheit der Token und Profile</b>	<p>Repository secrets</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Last updated</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>AZURE_WEBAPP_NAME</td> <td>31 minutes ago</td> <td></td> </tr> <tr> <td>AZURE_WEBAPP_PUBLISH_PROFILE</td> <td>now</td> <td></td> </tr> <tr> <td>DOCKERHUB_TOKEN</td> <td>1 minute ago</td> <td></td> </tr> <tr> <td>DOCKERHUB_USERNAME</td> <td>3 minutes ago</td> <td></td> </tr> </tbody> </table>	Name	Last updated	Action	AZURE_WEBAPP_NAME	31 minutes ago		AZURE_WEBAPP_PUBLISH_PROFILE	now		DOCKERHUB_TOKEN	1 minute ago		DOCKERHUB_USERNAME	3 minutes ago		
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<b>Anpassung im Code und commit und push</b>	<pre> server.js    ! docker-image.yml M    JS server.js M X Geänderte Zeilen JS server.js &gt; ↗ app.get('/') callback 1  'use strict'; 2 3  const express = require('express'); 4 5  // Constants 6  const PORT = process.env.PORT    8080; 7  const HOST = '0.0.0.0'; 8 9  // App 10 const app = express(); 11 app.get('/', (req, res) =&gt; { 12   res.send('Hello DevOps FS2024 :-)) - 2nd try!'); 13 }); 14 15 app.listen(PORT, HOST); 16 console.log(`Running on http://\${HOST}:\${PORT}`); 17 </pre>																
<b>Neues Image</b>	<p>hub.docker.com/repository/docker/nxle/devopsazure/general</p> <p>nxle / Repositories / devopsazure / General</p> <p>General Tags Builds Collaborators Webhooks Settings</p> <p><b>nxle/devopsazure</b> ⓘ</p> <p>Updated 1 minute ago</p> <p>devops</p> <p>INTEGRATION &amp; DELIVERY</p> <p>Tags</p> <p>This repository contains 1 tag(s).</p> <table border="1"> <thead> <tr> <th>Tag</th> <th>OS</th> <th>Type</th> <th>Pulled</th> <th>Pushed</th> </tr> </thead> <tbody> <tr> <td>latest</td> <td>Ubuntu</td> <td>Image</td> <td>...</td> <td>2 minutes ago</td> </tr> </tbody> </table> <p>See all</p>	Tag	OS	Type	Pulled	Pushed	latest	Ubuntu	Image	...	2 minutes ago						
Tag	OS	Type	Pulled	Pushed													
latest	Ubuntu	Image	...	2 minutes ago													
<b>Erfolgreiche Anpassungen</b>	<p>← → C devops-container-nole.azurewebsites.net</p> <p>Hello DevOps FS2024 :-)) - 2nd try!</p>																

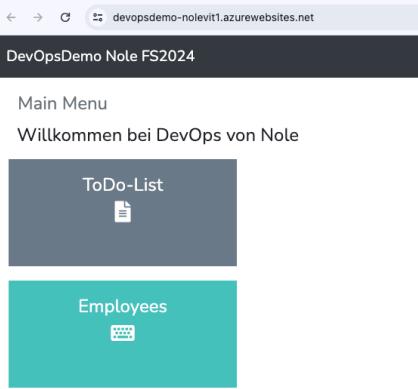
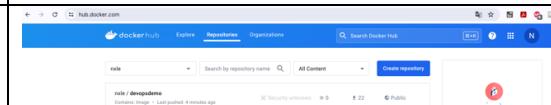
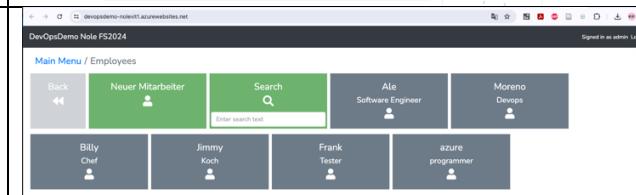
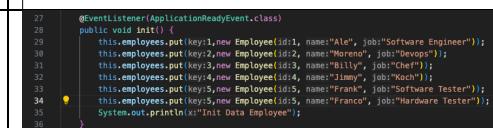
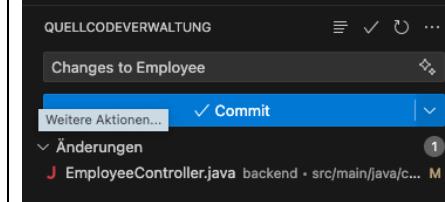
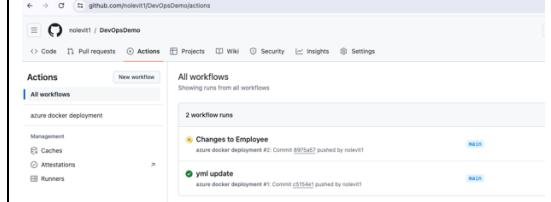
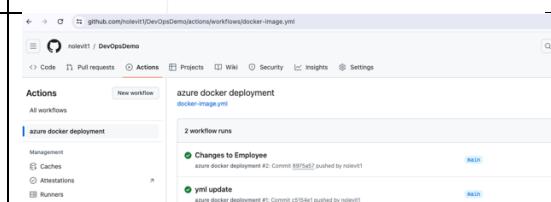
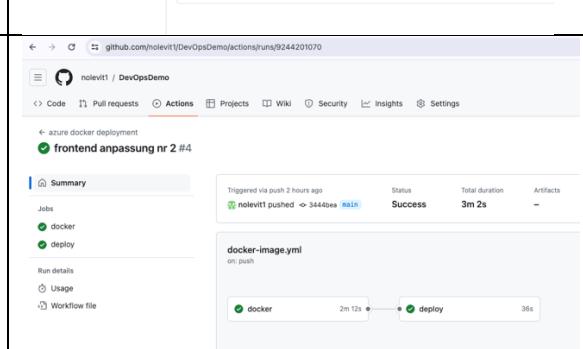
Ansicht im Github Actions	 <p>The screenshot shows the GitHub Actions interface for a repository named 'nolevitt / DevOpsAzure-note'. A green checkmark indicates a successful deployment. The deployment log shows the following steps:</p> <pre> deploy succeeded now in 6s  &gt; ⚡ Set up job &gt; ⚡ Deploy to Azure Web App   1 ► run azur/webapps-deploy@v2   7 Deploying image nrtle/devopsazure:latest to App Service   8 Successfully deployed Image to App Service.   9 Successfully updated deployment history at https://devops-container-nole.azurewebsites.net/deployments/5c61096c4893668bf6d6cd43310e35d81cd171664811763 10 App Service Application URL: https://devops-container-nole.azurewebsites.net &gt; ⚡ Complete job </pre>
Ansicht in Azure	 <p>The screenshot shows the Azure DevOps interface for a deployment. It includes sections for Einstellungen, Containerprotokolle, Buildprotokolle, and FTPS-Anmeldeinformationen. The build logs show a successful deployment:</p> <pre> Zeit Commit-ID Protokolle Kommentarsteller Status Meldung Saturday, May 25, 2024 (Z) 05/25/2024 4:41:57 PM +02:00 6a48109 App-Protokolle nolevit! Erfolgreich (Akto) ("type": "Deployment", "sha": "5c61096c4893668bf6d6cd43310e35d81cd171664811763", "status": "Succeeded", "url": "https://devops-container-nole.azurewebsites.net/deployments/5c61096c4893668bf6d6cd43310e35d81cd171664811763", "actor": "nolevit!", "slotName": "production") </pre>
Neuer Commit	 <p>The screenshot shows the GitHub Actions interface for a repository named 'nolevitt / DevOpsAzure-note'. A green checkmark indicates a successful deployment. The deployment log shows the following steps:</p> <pre> deploy succeeded now in 7s  &gt; ⚡ Set up job   1 Current runner version: '2.316.1'   2 Operating System   3 Runner Image   4 Azure Pipelines Provisioner   5 GITHUB_TOKEN Permissions   6 Secret Source Actions   7 Prepare workflow directory   8 Run .NET Core actions   9 Getting action download info   10 Download action repository 'azur/webapps-deploy@2'   11 Complete job names deploy  &gt; ⚡ Deploy to Azure Web App   12 Deploying Image nrtle/devopsazure:latest to App Service   13 Successfully deployed Image to App Service.   14 Successfully updated deployment history at https://devops-container-nole.azurewebsites.net/deployments/5c61096c4893668bf6d6cd43310e35d81cd171664811743   15 App Service Application URL: https://devops-container-nole.azurewebsites.net &gt; ⚡ Complete job </pre>
Erfolgreich	 <p>The screenshot shows a browser window displaying the URL <a href="https://devops-container-nole.azurewebsites.net">devops-container-nole.azurewebsites.net</a>. The page content is:</p> <p>Hello DevOps FS2024 :-)) - 4rd try!</p>

2.13 DEVOPSDEMO ALS AZURE WEB-APP

DevopsDemo als Azure Web-App	<a href="https://github.com/nolevit1/DevOpsDemo">https://github.com/nolevit1/DevOpsDemo</a>																								
Build erstellen	<pre>(base) alessandrone@AlironAlessandro DevOpsDemo % docker build -t nxle/devopsdemo:latest . [+] Building 8.0s (18/18) FINISHED --&gt; [internal] Load build definition from Dockerfile --&gt; =&gt; transferring dockerfile: 698B --&gt; [internal] determine base image: docker.io/library/openjdk:21-jdk-slim --&gt; =&gt; auto library/openjdk pull, token for registry=1.docker.io --&gt; [internal] load .dockerignore --&gt; =&gt; transferring context: 2B --&gt; [1/12] FROM docker.io/library/openjdk:21-jdk-slim@sha256:7072053847a8a05d7f3a14ebc778a90b30c50ce7e8f199382128a5338 --&gt; [internal] resolve base context --&gt; =&gt; transferring context: 9.08M --&gt; =&gt; CACHED [ 2/12] RUN apt-get update &amp;&amp; apt-get install -y curl &amp;&amp; curl -sL https://deb.nodesource.com/setup_20.x   bash - &amp;&amp; apt-get update &amp;&amp; apt-get install -y python3.10 --&gt; =&gt; CACHED [ 3/12] WORKDIR /usr/src/app --&gt; =&gt; CACHED [ 4/12] COPY . --&gt; =&gt; CACHED [ 5/12] COPY . --&gt; =&gt; CACHED [ 6/12] RUN cd frontend &amp;&amp; npm install --&gt; =&gt; CACHED [ 7/12] RUN mv frontend/dist Frontend/static --&gt; =&gt; CACHED [ 8/12] RUN mv frontend/static backend/src/main/resources --&gt; =&gt; CACHED [ 9/12] RUN rm -r Frontend --&gt; =&gt; CACHED [ 10/12] RUN cd backend &amp;&amp; chmod +x gradlew --&gt; =&gt; CACHED [ 11/12] RUN cd backend &amp;&amp; ./gradlew build --&gt; =&gt; exporting to image --&gt; =&gt; exporting layers --&gt; =&gt; writing Image sha256:c3948a78380c10402f2e99338673552bf47df3aa8be2959ab4e52cb3acb45 --&gt; =&gt; naming to docker.io/nxle/devopsdemo:latest </pre> <p>What's Next? View a summary of image vulnerabilities and recommendations → <a href="#">docker scout quickview</a></p>																								
Testen im Docker Desktop	<p>Containers <a href="#">Give feedback</a></p> <table border="1"> <thead> <tr> <th colspan="2">Container CPU usage</th> <th colspan="2">Container memory usage</th> </tr> <tr> <td>1.25%</td> <td>/ 800% (8 CPUs available)</td> <td>168.2MB</td> <td>/ 3.74GB</td> </tr> </thead> <tbody> <tr> <td colspan="4"> <input type="text" value="Search"/> <input type="button" value="Search"/> <span style="margin-left: 10px;">Only show running containers</span> </td> </tr> <tr> <th>Name</th> <th>Image</th> <th>Status</th> <th>CPU (%)</th> <th>Port(s)</th> <th>Last started</th> </tr> <tr> <td><input type="checkbox"/></td> <td> <a href="#">condescending_edison</a> 2af1c54e4bd7d</td> <td><a href="#">nxle/devopsdemo</a></td> <td>Running</td> <td>0.64% <a href="#">9001:8080</a></td> <td>42 seconds ago</td> </tr> </tbody> </table>	Container CPU usage		Container memory usage		1.25%	/ 800% (8 CPUs available)	168.2MB	/ 3.74GB	<input type="text" value="Search"/> <input type="button" value="Search"/> <span style="margin-left: 10px;">Only show running containers</span>				Name	Image	Status	CPU (%)	Port(s)	Last started	<input type="checkbox"/>	 <a href="#">condescending_edison</a> 2af1c54e4bd7d	<a href="#">nxle/devopsdemo</a>	Running	0.64% <a href="#">9001:8080</a>	42 seconds ago
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<input type="text" value="Search"/> <input type="button" value="Search"/> <span style="margin-left: 10px;">Only show running containers</span>																									
Name	Image	Status	CPU (%)	Port(s)	Last started																				
<input type="checkbox"/>	 <a href="#">condescending_edison</a> 2af1c54e4bd7d	<a href="#">nxle/devopsdemo</a>	Running	0.64% <a href="#">9001:8080</a>	42 seconds ago																				

<p>Funktioniert immernoch ☺</p>	
<p>Auf Docker Hub pushen</p>	<pre>(base) alessandrone@AironAlessandro DevOpsDemo % docker push nxle/devopsdemo:latest 59f7b659306b1e0d: Pushed 5d47e7c7e91d23: Pushed fa97bdd0c4cf: Pushed 2e359f13a926: Pushed 1a1a2a2a2a2a: Pushed d9d19591d1c1: Pushed ac975d85561: Pushed 4f19cb31536b: Pushed 352eb7069eb: Pushed c97218405288: Pushed 0e8a082177d5: Pushed b5a9e082177d5: Pushed 31162778702d: Pushed latest: digest: sha256:819a6caa4a93f7328914b9c44a853a6c250f0fb32876477c3bb18fb1c5fc42 size: 3268 (base) alessandrone@AironAlessandro DevOpsDemo %</pre>
<p>Docker Hub Repo und Image erfolgreich erstellt</p>	
<p>Gleiches Szenario mit Azure Ressourcengruppe</p>	<pre>(base) alessandrone@AironAlessandro DevOpsDemo % az webapp create --resource-group devops-container --name devops-container --os-type Linux --runtime .NETCoreApp,2.1 --deployment-container-image-name mcr.microsoft.com/aspnet:4.0 --ip-address 0.0.0.0 --port 80 --scm-type Kudu Option '--deployment-container-image-name' has been deprecated and will be removed in a future release. App settings have been redacted. Use 'az webapp/logicapp/functionapp config appsettings list' to view. App settings have been redacted. Use 'az webapp/logicapp/functionapp config appsettings list' to view.  {   "availabilityState": "Normal",   "clientCertAuthentication": true,   "clientCertEnabled": false,   "clientCertExclusionPaths": null,   "clientCertRequired": false,   "cloningInfo": null,   "containerSize": 0,   "containerSizeInGb": 0,   "creationTimestamp": "2018-07-10T13:43:29Z",   "dailyMemoryQuota": 0,   "dapConfig": null,   "dataConnectionString": "devopsdemo-nolevit1.azurewebsites.net",   "enabled": true,   "enabledHostNames": [     "devopsdemo-nolevit1.azurewebsites.net",     "devopsdemo-nolevit1.scm.azurewebsites.net"   ],   "extendedLocation": null,   "ftpPublishingUrl": "ftps://www-prod-am-783.ftp.azurewebsites.windows.net/site/wwwroot",   "hostNameSslStates": [     {       "certificateResourceId": null,       "hostType": "Standard",       "ipBased": false,       "ipBasedSslState": "NotConfigured"     }   ] } (base) alessandrone@AironAlessandro DevOpsDemo % az webapp config appsettings set --resource-group devops-container --name devopsdemo-nolevit1 --settings WEBSITES_PORT=8080 App settings have been redacted. Use 'az webapp/logicapp/functionapp config appsettings list' to view.  {   "name": "WEBSITES_ENABLE_APP_SERVICE_STORAGE",   "slotSetting": false,   "value": null }, {   "name": "DOCKER_REGISTRY_SERVER_URL",   "slotSetting": false,   "value": null }, {   "name": "WEBSITES_PORT",   "slotSetting": false,   "value": null } (base) alessandrone@AironAlessandro DevOpsDemo %</pre>
<p>Neue Azure Web-app</p>	

<h2>YML File anpassungen mit passenden Docker hub Usernamen</h2> <pre> name: DevOpsDemo on:   push:     branches:       - 'main'   jobs:     docker:       runs-on: ubuntu-latest       steps:         - name: Set up QEMU           uses: docker/setup-qemu-action@v2         - name: Set up Docker Buildx           uses: docker/setup-buildx-action@v2         - name: Login to Docker Hub           uses: docker/login-action@v2           with:             username: \${{secrets.DOCKERHUB_USERNAME}}             password: \${{secrets.DOCKERHUB_TOKEN}}         - name: Build and push           uses: docker/build-push-action@v3           with:             push: true             tags: nxle/devopsdemo:\${{github.sha}}   deploy:     permissions:       contents: none     runs-on: ubuntu-latest     needs: docker     steps:       - name: Deploy to Azure Web App         id: deploy-to-webapp         uses: azure/webapps-deploy@v2         with:           app-name: \${{env.AZURE_WEBAPP_NAME}}           publish-profile: \${{secrets.AZURE_WEBAPP_PUBLISH_PROFILE}}           images: nxle/devopsdemo:\${{github.sha}} </pre>	
<h2>Neuer Token für Github Actions</h2>	
<h2>Github Secret Keys</h2>	
<h2>Commiten und Pushen</h2>	

Devopsdemo funktioniert	
Kontrolle vom neuen Image	
App funktioniert. Zusätzlich wurde azure programmer noch hinzugefügt über die Oberfläche (nicht im Code)	
Überschreibe Frank mit Franco als Hardware Tester.	
Neue Änderungen commit und pushen	
Github Actions	
Erfolgreich	
Frontend Anpassung	

<p><b>Änderung nachvollziehen</b></p>	
<p><b>Änderung in der Webapp übernommen nach sehr langem warten</b></p>	

### 3 SCHLUSSTEIL

#### 3.1 REFLEXION, ZUSAMMENFASSUNG

Im Laufe des Frühlingssemesters 2024 wurden im DevOps-Kurs zahlreiche Übungen durchgeführt, die einen tiefen Einblick in die DevOps-Methodik gewährten. Dabei waren einige Übungen aufeinander abgestimmt, während andere unabhängig voneinander stattfanden.

Zu Beginn des Semesters stand die Einrichtung der benötigten Software und Entwicklungsumgebungen im Vordergrund. Es wurden GitHub-Konten erstellt, Git-Clients konfiguriert, und Tools wie Java, Gradle, Visual Studio Code, sowie verschiedene Erweiterungen installiert. Zusätzlich wurden npm, Selenium IDE, Docker Desktop, Jenkins, SonarQube und Azure-Services eingerichtet. Ziel war es, eine solide technische Grundlage für die folgenden Übungen zu schaffen. Einige Mac-Nutzer stiessen auf anfängliche Schwierigkeiten, die durch die Unterstützung von Adrian und dem Internet behoben wurden.

Versionskontrolle mit Git und GitHub war ein zentrales Thema. Obwohl ich bereits Vorkenntnisse hatte, gab es Neues zu entdecken, wie beispielsweise Github Actions. Wir lernten, wie man Repositories erstellt, verwaltet, klonnt sowie Branches und Pull Requests nutzt. Diese Fertigkeiten bildeten die Grundlage für zahlreiche Übungen, da wir nahezu wöchentlich mit Git arbeiteten. In den folgenden Wochen wurde das Augenmerk auf die Build-Tools Gradle und npm gelegt, mit denen wir erste Builds erstellten und eigene Beispiele integrierten. Das erworbene Wissen wurde in der darauffolgenden Woche in einem Projekt angewendet, in dem wir eine vorgegebene Applikation mit Front- und Backend erweitern durften.

Beim Unit Testing entwarfen wir Testcodes für Apps, wobei ich mich für das ScoreKeeper-Projekt entschied. Die testgetriebene Entwicklung fand ich besonders reizvoll, da sie eine neue Programmiermethode für mich darstellte. Trotzdem blieb ich skeptisch bezüglich der Realitätstauglichkeit, da ich es aus dem Berufsleben anders gewohnt war. Wir nutzten JUnit für das Schreiben und Integrieren von Unit Tests in unsere Projekte.

In der achten Woche konzentrierten wir uns auf die Überwachung und Verbesserung der Code-Qualität. Wir setzten SonarQube ein, um den Code zu analysieren und integrierten unser Front- und Backend in das Tool, um die Code-Qualität zu überwachen. Außerdem wurden Integrationstests mit Selenium IDE durchgeführt, für die wir eigene Testfälle entwickelten und diese mit Kommilitonen teilten.

Die neunte Woche stand im Zeichen der Containerisierung. Wir lernten den Umgang mit Docker zur Bereitstellung von Anwendungen, die miteinander kommunizieren konnten. Ich konfigurierte MySQL und Adminer als separate Docker-Container und vernetzte sie.

In den Wochen zehn und elf erarbeiteten wir uns Kenntnisse über Continuous Integration (CI) mit Jenkins, lernten das Erstellen und Konfigurieren von Jenkins-Pipelines und setzten JUnit sowie Jacoco zur Messung von Tests und Code-Coverage ein. Dabei nutzten wir erneut unser DevOpsDemo-Repository.

Eines der Highlights war das Docker-Deployment in der zwölften Woche. Wir lernten, Docker-Container mittels Dockerfile zu erstellen und zu verwalten und automatisierten in Jenkins Build- und Deploy-Jobs, die bei jedem neuen Code-Push ausgeführt wurden. Das Semester endete mit Cloud Deployment, wobei Anwendungen in der Azure-Cloud bereitgestellt wurden. Dies beinhaltete die Nutzung von Docker und Azure-Services sowie die Konfiguration von Git-Repositories mit Dockerfiles für automatisierte Workflows.

Das Semester bot eine intensive Einführung in die Welt der DevOps, wobei die praktischen Übungen nicht nur theoretisches Wissen vermittelten, sondern auch unmittelbare Anwendungen ermöglichten, die die Effizienz und Zuverlässigkeit in der Softwareentwicklung deutlich verbesserten.

### 3.2 FEEDBACK ZUR VORLESUNG (OPTIONAL)

Das Modul DevOps war insgesamt sehr spannend und lehrreich, insbesondere die praktischen Übungen haben zum Verständnis der Entwicklungs- und Operations-Prozesse beigetragen. Es wäre jedoch bereichernd gewesen, wenn das Modul eine durchgängige Projektarbeit von Anfang bis Ende für jeden Teilnehmer vorgesehen hätte. Dadurch könnte man den gesamten Entwicklungszyklus eigenständig durchlaufen und praktische Erfahrungen sammeln.

Ein weiterer Punkt, der das Lernerlebnis verbessern würde, ist die Nutzung von GitHub Codespaces. Dies könnte potenzielle Hardware-Probleme vermeiden, die auftreten können, wenn Studierende unterschiedliche Systemkonfigurationen verwenden. Solche Schwierigkeiten haben zeitweise den Lernprozess verlangsamt und waren aufwändig zu beheben. Die Integration von GitHub Codespaces würde einen einheitlicheren Arbeitsbereich bieten, der die Durchführung der Projekte und Übungen erleichtert.

Insgesamt war das Modul jedoch sehr informativ und die praktischen Übungen waren sehr hilfreich, um die Theorie mit realen Anwendungsfällen zu verknüpfen. Adrian hat dies auch sehr gut vermittelt und das Know-How spürt man. Ich hoffe, dass zukünftige Iterationen des Kurses vielleicht eine kontinuierliche Projektarbeit integrieren können, um das Lernen noch weiter zu vertiefen.