



# JAVA exercises testing

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SDA Software development academy

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Background photo: Evening in Klaipėda, Lithuania, 2020



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## Acknowledgements

Our trainers were exceptional: friendly, positive, open, sharing knowledge with passion. I want to acknowledge our trainers:

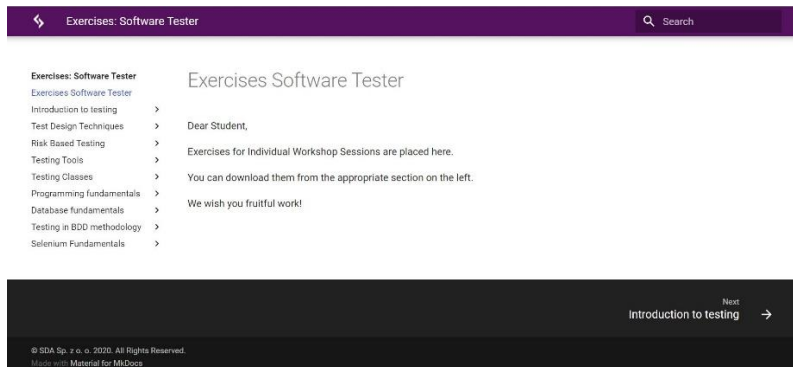
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## Document purpose

SDA academy students use a dedicated webpage for self-training [Exercises: Software Tester](#) (Figure 1). The purpose of this document is to describe performed testing on one of the most extensive parts of this webpage: [Programming fundamentals](#). This part of exercises requires from users JAVA skills. JAVA IDE tool 'IntelliJ IDEA Community v.2020.1.3' was used to run JAVA scripts. TestRail was used as a tool for creation of Testing Project with Testcases, Test runs, Test Report. The bug reports were reported on [GitHub public repository](#).

*Figure 1. SDA webpage for testing.*



## Testing section

Webpage tree with areas for testing and not for testing are shown in Figure 2.

Figure 2. Webpage hierarchical tree and areas for testing.



## Testing checklist

The detailed testing checklist is provided as an Annex 1. SDA\_FP\_2010-10-07 Checklist.xlsx. In total 51 testing points were planned.

Figure 3 The header of testing checklist ( first 10 rows)

Id	Testing point	Pass/Fail/Not tested	Bug ID	Comments	URL
Google Chrome					
1	Subpage Exercise1	Pass			
2	Subpage Exercise2	Pass			
3	Subpage Exercise3	Fail	Bug SDA_FP_T3_D1	<a href="#">GitHub</a>	<a href="https://github.com/jolgri/SDA_FP_Bugs/issues">https://github.com/jolgri/SDA_FP_Bugs/issues</a>
4	Subpage Exercise4	Pass			
5	Subpage Exercise5	Fail	Bug SDA_FP_T5_D2	<a href="#">GitHub</a>	<a href="https://github.com/jolgri/SDA_FP_Bugs/issues">https://github.com/jolgri/SDA_FP_Bugs/issues</a>
6	Subpage Exercise6	Pass			
7	Subpage Exercise7	Pass			
8	Subpage Exercise8	Fail	Bug SDA_FP_T8_D3	<a href="#">GitHub</a>	<a href="https://github.com/jolgri/SDA_FP_Bugs/issues">https://github.com/jolgri/SDA_FP_Bugs/issues</a>
9	Subpage Exercise9	Fail	Bug SDA_FP_T9_D4	<a href="#">GitHub</a>	<a href="https://github.com/jolgri/SDA_FP_Bugs/issues">https://github.com/jolgri/SDA_FP_Bugs/issues</a>
10	Subpage Exercise10	Pass			

Before test creation, I have decided to use TestRail for the management of the testing. I have created new project SDA\_FP\_Java\_Exercises and 3 Test suits with 33 test cases:

Figure 4 Project management in TestRail (testing version) with three Test suits

The screenshot shows the TestRail web interface for a project named 'Exercises 1.25'. The main content area displays three test suites, each with a progress bar indicating the completion status of test cases. The 'Exercises 1.25' suite is 64% complete, 'Main page testing' is 33% complete, and 'Other tests not classified' is 0% complete. The interface includes a sidebar with a '+ Add Test Suite' button and a bottom navigation bar with icons for 'Create a project', 'Add cases', 'Start a run', 'Add results', 'Invite users', and 'Set up integration'. The top navigation bar shows 'OVERVIEW', 'TODO', 'MILESTONES', 'TEST RUNS & RESULTS', 'TEST SUITES & CASES', and 'REPORTS'. The right sidebar shows 'ADMINISTRATION'.

## Detailed test cases

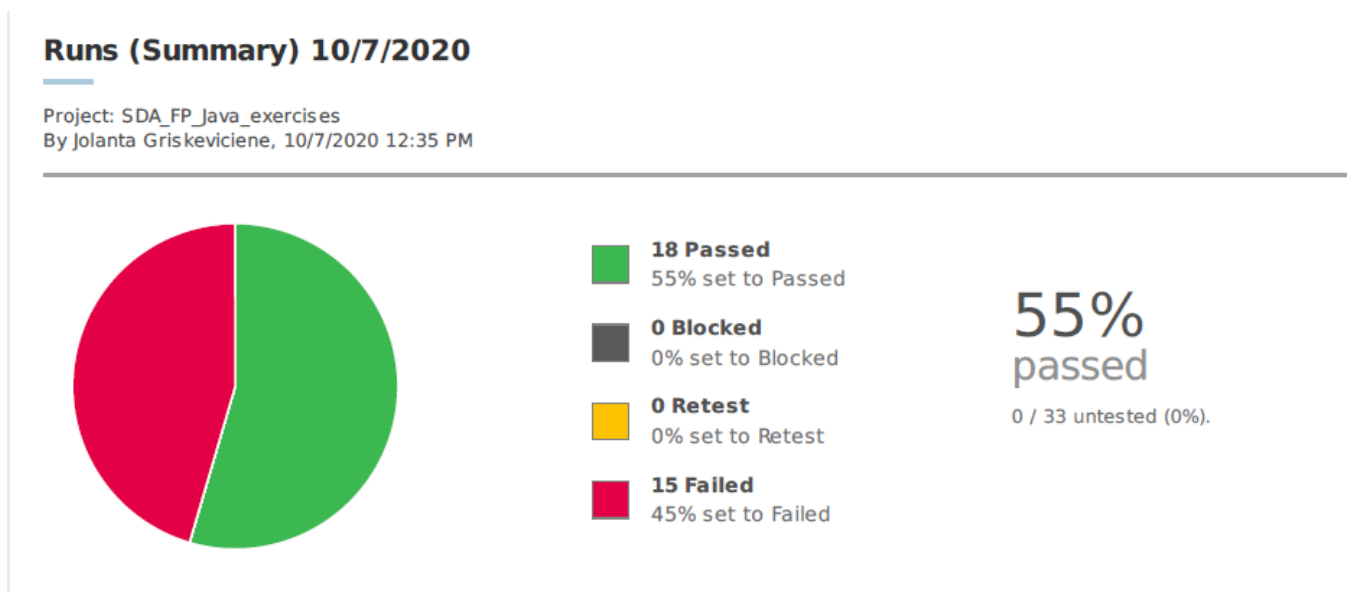
There are 33 test cases created in TestRail environment. All test cases were created and entered into TestRail test version as in Figure 5.

Figure 5. Test case example in TestRail

The screenshot shows a TestRail interface for a test case titled "Exercise 1 testing". The top navigation bar includes links for "Return to Dashboard", "SDA\_FP\_Java\_exercises", and user information. The main content area displays the test case details, including a table with columns for Type, Priority, Estimate, and References. Below this, the "Preconditions" section lists requirements like "https://homeworks.testers.sdcademy.pro/ and JAVA code are available." and "IntelliJ IDEA is available with the project SDA\_FP\_JAVA\_project created for testing". The "Steps" section contains a table with three steps: 1. User opens the webpage and navigates to Programming fundamentals section, exercise 1. 2. User clicks on «Code». 3. User copies the JAVA code into IntelliJ project and runs it. The "Expected Result" column for each step describes the outcome: "Webpage Exercise 1 with a link to a solution (code) is opened.", "New webpage with JAVA code for exercise opens", and "Hello World". A progress bar at the bottom shows the workflow: Create a project, Add cases, Start a run, Add results, Invite users, and Set up integration.

Overall 33 Test cases were run. The percentage of tests passed was 55% as shown in detailed TestRail report. Please find more details in the Annex 2 (SDA\_FP\_2010 10 07 TestRail report 9.pdf)

Figure 6 Test Rail Summary report figure shows 18 passed and 15 failed Test cases (55%, n=33)



## Issues/bugs identified

There are 15 bugs identified and 15 detailed bug reports created in the GitHub platform:

[www.github.com/jolgri/SDA\\_FP\\_Bugs/issues](https://www.github.com/jolgri/SDA_FP_Bugs/issues) :

<input type="checkbox"/>	15 Open	0 Closed	Author	Label	Projects
<input type="checkbox"/>	SDA_FP_Other_T2_D15 Non English language text identified	bug	#15 opened 8 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_Other_T1_D14 Navigation, missing webpages or information	bug	#14 opened 8 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_Main_T5_D13 Scroll bar of stacked menu bar looks abnormal in Internet Edge browser	bug	#13 opened 8 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_Main_T4_D12 The footer navigation bar is not fixed	bug	#12 opened 8 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_Main_T3_D11 The menu bar major chapters are not linked to the specific pages	bug	#11 opened 9 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_Main_T1_D10 Logo is displayed only if full screen view is used	bug	#10 opened 10 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_T24_D9 The input accepted values out of logical range in Exercise 24	bug	#9 opened 20 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_T23_D8 The output section on Exercise 23 webpage has unnecessary empty output container and 2 lines of text.	bug	#8 opened 20 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_T22_D7 The output example is missing on Exercise 22 webpage.	bug	#7 opened 20 hours ago by jolgri		
<input type="checkbox"/>	SDA_FP_T15_B6 The reverse number functionality works only with integers.	bug	#6 opened yesterday by jolgri		
<input type="checkbox"/>	SDA_FP_T13_D5 Discrepancy between the assignment requirements and the output	bug	#5 opened yesterday by jolgri		
<input type="checkbox"/>	SDA_FP_T9_D4 Discrepancy between the assignment text and text in the output.	bug	#4 opened yesterday by jolgri		
<input type="checkbox"/>	SDA_FP_T8_D3 Exercise 8 Java script performs inaccurate, misleading calculation	bug	#3 opened yesterday by jolgri		
<input type="checkbox"/>	SDA_FP_T5_D2 JAVAscript contains comments in the Polish language.	bug	#2 opened 3 days ago by jolgri		
<input type="checkbox"/>	SDA_FP_T3_D1 Javascript with abnormal values of numeric variables causes the IntelliJ blockage of the following tests in Exercise 3.	bug	#1 opened 3 days ago by jolgri		

Each detailed bug report contains mandatory information (bug ID, Title, Description, Steps, Expected result, Test result, Date Raised, Detected By, Status, Severity), and screenshots. Every bug report id is a kind of abbreviation of the linked information in the specific test case in TestRail environment. (Figure 8)

The bug identifier contains this information, e.g. SDA\_FP\_Main\_T1\_D14:

SDA = Software Development Academy;  
FP= Final Project;  
T1= Test case one in Exercises 1\_25 tests suite,  
Main= in Main page tests suite,  
Other= in Other not classified tests suite;  
D14=Defect identifier.

The detailed summary report in TestRail about performed test runs provides an overview of all 15 bugs identified and reported (Annex 3. SDA\_FP\_2010 10 07 TestRail-report-10.pdf).

Figure 7 TestRail Summary report. Number of defects by testing suite( n= 15)

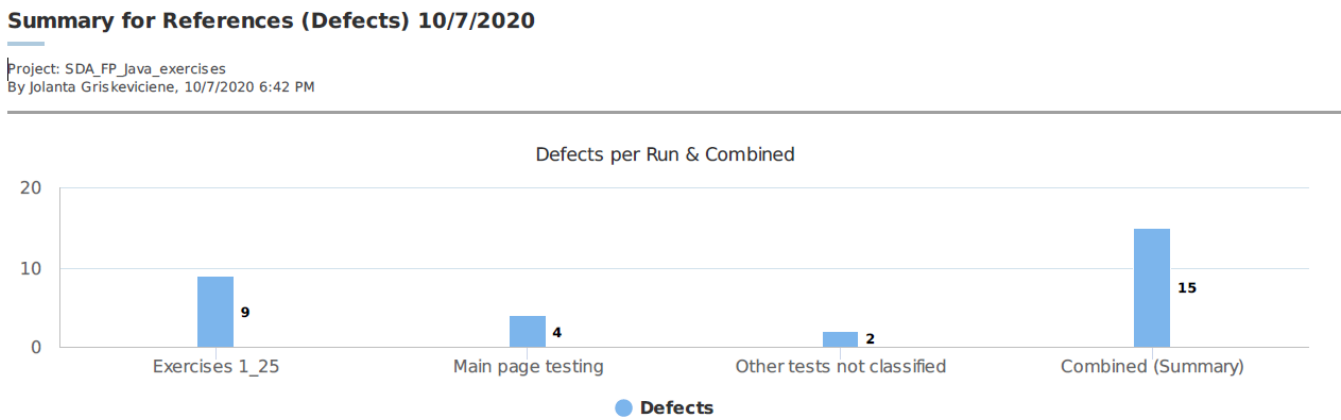


Figure 8 TestRail report. References and Defects.

References & Defects						
References	ID	Title	Exercises 1_25	Main page testing	Other tests not cla...	Latest & Combined
FP_Main_1	C26	Logo hover and link to the home page		FP_Main_T1_D10		FP_Main_T1_D10
FP_Main_2	C27	Search function				
FP_Main_3	C28	Menu bar		FP_Main_T3_D11		FP_Main_T3_D11
FP_Main_4	C29	Home page Body part				
FP_Main_5	C30	Footer		FP_Main_T4_D12		FP_Main_T4_D12
FP_Main_6	C31	Scroll bars		FP_Main_T5_D13		FP_Main_T5_D13
FP_Other_T1	C32	Navigation testing			SDA_FP_Other...	SDA_FP_Other...
FP_Other_T2	C33	Language			SDA_FP_Other...	SDA_FP_Other...
FP_T1	C1	Exercise 1 testing				
FP_T2	C2	Exercise 2 testing				
FP_T3	C3	Exercise 3 testing	FP_T3_D1			FP_T3_D1
FP_T4	C4	Exercise 4 testing				
FP_T5	C5	Exercise 5 testing	FP_T5_D2			FP_T5_D2
FP_T6	C6	Exercise 6 testing				
FP_T7	C7	Exercise 7 testing				
FP_T8	C8	Exercise 8 testing	FP_T8_D3			FP_T8_D3
FP_T9	C9	Exercise 9 testing	FP_T9_D4			FP_T9_D4
FP_T10	C10	Exercise 10 testing				
FP_T11	C11	Exercise 11 testing				
FP_T12	C12	Exercise 12 testing				
FP_T13	C13	Exercise 13 testing	FP_T13_D5			FP_T13_D5
FP_T14	C14	Exercise 14 testing				
FP_T15	C15	Exercise 15 testing	FP_T15_D6			FP_T15_D6



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## Improvements and reflections

Self-learning is a crucial part of education. I liked the SDA Homeworks exercises very much, and due to this reason, I have decided to perform this webpage testing. The homework platform contains beneficial information and can be used by students with various level of knowledge. The trainers should provide access to the training material as early as possible at the beginning of the course.

The chapter programming fundamentals is the chapter which might be used not only by testers but by JAVA course students, too. If I could suggest, it would be a benefit for trainers and students to have one webpage SDA Students page with Training material and additional links to :

- Slides,
- Homeworks,
- ISTQB resources: materials and test examples,
- Recommended e-books,
- Software installations guides,
- SDA optional Video courses ( e.g.GIT, HPPT, Agile etc.),
- SDA optional quizzes (e.g. GIT, HTTP),
- Links to various tools,
- Links to video classes for remote students,

For testing purpose, I have created the first Selenium WebDriver automated test ( Annex 4. SDA\_FP\_2020 10 07 SeleniumWebDriver.py), which checks if we can access the specific JAVA script in Programming Fundamentals. However, this kind of automatisation is possible only with chapters, which have the same three main parts: Assignment, Output example, and solution (code). However, there is only Selenium chapter organised similarly. All training topics are structured differently. The architecture of the training material library is one of the points for discussion.

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## Tools used

Table 1. List of tools

ID	Name of the tool	Webpage	For what purpose was used	Comments
1	Smartdraw	<a href="https://www.smartdraw.com/">https://www.smartdraw.com/</a>	For schemas drawing	
2	IntelliJ IDEA Community v.2020.1.3	<a href="https://www.jetbrains.com/idea/">https://www.jetbrains.com/idea/</a>	For JAVA programming	
3	TestRail	<a href="https://jolgri.testrail.io/index.php?/projects/overview/1">https://jolgri.testrail.io/index.php?/projects/overview/1</a>	For Testing Project creation with Test Suites, Test cases, Test runs and Test reports	
4	GitHub	<a href="https://github.com/jolgri/SDA_FP_Bugs/issues">https://github.com/jolgri/SDA_FP_Bugs/issues</a>	For Detailed Bug reports	
5	Selenium IDE	<a href="https://chrome.google.com/webstore/detail/selenium-ide/mooikfkahbdckldjjndioackbalphokd">https://chrome.google.com/webstore/detail/selenium-ide/mooikfkahbdckldjjndioackbalphokd</a>	For recording steps	
6	Visual Studio Code 2019	<a href="https://code.visualstudio.com/">https://code.visualstudio.com/</a>	To prepare and run Selenium IDE exported python file & Selenium WebDriver	
7	Google Chrome		For Browsers and responsiveness testing	
8	Internet Edge		For Browsers and responsiveness testing	
9	Firefox		For Browsers and responsiveness testing	
10	SAMSUNG Galaxy S9		For Browsers and responsiveness testing	
11	Grammarly		For Spelling check	

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## Annexes

- Annex 1. SDA\_FP\_2010-10-07 Checklist.xlsx
- Annex 2. SDA\_FP\_2010 10 07 TestRail report 9.pdf
- Annex 3. SDA\_FP\_2010 10 07 TestRail report 5.pdf
- Annex 4. SDA\_FP\_2010 10 07 Selenium WebDriver.py