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Contest – Conference

Test Execution Log

Project:	Web-SynDic
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Product:	Web System for Demonstrating and Testing the Syntactic Algorithms for Solving Linear Diophantine Equations in Nonnegative Integers

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Contents

1 Introduction

The Web-SynDic project[1] is a student software engineering (SE) project of the Petrozavodsk State University (PetrSU), Department of Computer Science (CSDept).

The project is related to the research done at CSDept of PetrSU in development of a new type of algorithms for efficient solving some classes of nonnegative linear Diophantine equations (NLDE) by syntactic (parsing) methods [10, 11, 12]. These syntactic algorithms seem to be promising tool for solving some classes of NLDE system; more exactly a class of NLDE system, associated with formal grammars (ANLDE systems). For this class the syntactic algorithms allow efficient (polynomial and pseudo-polynomial) computations comparing with the general NLDE case when the same computational problems are NP-complete or even overNP [13].

The general goal of the project is to develop a full function web system[2] for visual demonstrating and testing the syntactic algorithms via the Internet. This allows researchers to input ANLDE systems (manually or automatically generated), search their Hilbert bases, test the correctness of the found solution, estimate the resource consumption, and compare the efficiency with available solvers, different from syntactic.

1.1 Purpose

This document gives a description of the executed test cases, their results and conclusions. It mostly consists of test execution reports and is based on the Test Plan [5]. The original Test Execution Document is [7].

The goal is in grounding the correctness of the software. The objectives are in covering all requirements by executing all planned test cases, fixing not only discovered errors but all passed tests, and storing compactly related data and results. This information are the base for the debugging phase, guarantees on a certain level that the software satisfies the requirements and also this is needed for regression testing on later phases of the project.

The document is divided into unit (section 2), integration (section 3), validation (section 4), and system (section 5) sections. This corresponds the testing phases used in the project. Detailed description of test cases is presented in the Test Plan [5]. New test cases, not defined in the test plan, may appear when necessary. Supplementary stuff (drivers and stubs code, input/output data, etc.) for each executed test is located in the Web-SynDic CVS repository [2].

1.2 References

[1] Web-SynDic Project development and maintenance site.
`http://zeta.cs.karelia.ru/Web-SynDic/doc/eng/` (English)

[1] The original, more detailed document set of Web-SynDic Project can be found at [1].
[2] The Web-SynDic Server is published at [3].

`http://zeta.cs.karelia.ru/Web-SynDic/doc/rus/` (Russian)

[2] The Web-SynDic CVS repository, located at
`zeta.cs.karelia.ru/usr/local/cvsroot/Web-SynDic/`

[3] The primary Web-SynDic Server is installed at
`http://zeta.cs.karelia.ru:8080/Web-SynDic/main.jsp`

[4] Web-SynDic: Requirements Specification. The original version.
`http://zeta.cs.karelia.ru/Web-SynDic/doc/eng/requirements/`

[5] Web-SynDic: Test Plan. The original version.
`http://zeta.cs.karelia.ru/Web-SynDic/doc/eng/testing/`

[6] Web-SynDic: Implementation Document. The original version.
`http://zeta.cs.karelia.ru/Web-SynDic/doc/eng/implementation/`

[7] Web-SynDic: Test Execution Document. The original version.
`http://zeta.cs.karelia.ru/Web-SynDic/doc/eng/test-exec/`

[8] Roger S. Pressman. *Software Engineering. A Practitioner's Approach.* European adapt., 5th ed. McGraw-Hill, 2000. 915 p.

[9] Ian Sommerville. *Software Engineering.* 6th ed. Addison-Wesley, 2000.

[10] Yury A. Bogoyavlensky, Dmitry G. Korzun, *Obshchiy vid resheniya sistemy lineynih diophantovih uravneniy, associirovannoy s kontextno-svobodnoy grammatikoy.* Trudy Petrozavodskogo gosudarstvennogo universiteta. Ser. "Prikladnaya matematika i informatika". Vol. 6. Petrozavodsk, 1998. pp. 79–94. (in Russian)

[11] Dmitry G. Korzun. *Syntactic Algorithms for Solving Nonnegative Linear Diophantine Equations and their Application for Modelling of Internet Link Workload Structure.* PhD Thesis, Department of Computer Science, University of Petrozavodsk, 2002. 185 p. (in Russian)

[12] Dmitry G. Korzun. *Grammar-Based Algorithms for Solving Certain Classes of Nonnegative Linear Diophantine Systems.* Proceedings of Annual international Finnish Data Processing Week at the University of Petrozavodsk (FDPW'2000): Advances in Methods of Modern Information Technology. Vol. 3. Petrozavodsk, 2001, pp. 52–67.

[13] Schrijver A. *Theory of linear and integer programming.* Wiley, Chichester, 1986.

1.3 Overview

The test execution is based on the Test Plan [5]. If a test case does not provide concrete values of parameters (e.g. ranges only), then they should be specified in this document (or references to separate files). New test cases may also appear when necessary.

The testing phase is divided into unit (U-test), integration (I-test), validation (V-test), and system testing. On the unit testing the targets are unit modules of the software: java classes and java server pages. During the integration testing clusters of units are tested starting from smallest (bottom-up approach). The goal of the validation testing is to check that the user requirements are satisfied. The system testing is a variation of alpha-testing (α-test).

The minimal configuration, with which the web system is guaranteed to work, is defined in the section Configuration Requirements of [4]. Table 1 shows the main characteristics of the test environment.

Table 1: Test environment

Hardware		**Software**		**Testers**	
CPU:	IA32, 1200MHz	OS:	Linux 2.4.19, Windows (98, XP, 2000)	U-test:	developers
RAM:	256Mb	Java:	Sun J2SDK 1.4.1, Apache Tomcat 4	I-test:	developers
		Browser	MS IExplorer, Mozilla, Netscape, Opera	V-test:	developers, experts
				α-test:	students, researches

Test execution reports are organized as a set of tables. Each table corresponds to a logical testing unit, e.g. unit of code, module, or subsystem. A row in a table describes one execution of one test; all rows are sorted in the chronological order.

2 Unit Testing

Unit tests specifications are provided in section 3 *Unit Testing* of the Test Plan [5]. The goal is to exercise that each individual unit works as it is supposed. These tests are executed by the developers in parallel with the implementation.

Each java class or JSP is independently tested according to its test specification by testing key methods or other principal features of this unit.

2.1 JSP Pages

W3C Markup Validation Service is used for checking pages for conformance to the HTML specifications.

Date	Module	Test case	Tester(s)	Type	Result
17.11.2003	login.jsp	Page produces correct response (Log In form layout and input fields).	M. Kryshen	hand-written	passed
17.11.2003	login.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
19.11.2003	main.jsp	Page produces correct response (see Page Layout) with the requested page included in the content area..	M. Kryshen	hand-written	passed
19.11.2003	main.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
19.11.2003	registration.jsp	Page produces correct response (Registration form layout and input fields).	M. Kryshen	hand-written	passed
19.11.2003	registration.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
21.11.2003	userinfo.jsp	Page produces correct response (User Information form layout and input fields).	M. Kryshen	hand-written	passed
21.11.2003	userinfo.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
21.11.2003	userinfo.jsp	Page must not be available for anonymous user.	M. Kryshen	hand-written.	passed

21.11.2003	userinfo.jsp	Registered users (except admin) are not allowed to access other user's profile.	M. Kryshen	hand-written.	passed
22.11.2003	limits-default.jsp	Page produces correct response (Default Limits form layout and input fields).	M. Kryshen	hand-written	passed
22.11.2003	limits-default.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
22.11.2003	limits.jsp	Page produces correct response (Limits form layout and input fields).	M. Kryshen	hand-written	passed
22.11.2003	limits.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
22.11.2003	limits.jsp	Registered users (except admin) are not allowed to access other user's limits.	M. Kryshen	hand-written.	passed
26.11.2003	notes.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	failed: no "maxlength" parameter in the "textarea" tag.
26.11.2003	notes.jsp	Produced HTML code is valid HTML 4.01 (previous error fixed, retry).	M. Kryshen	automatic	passed.
26.11.2003	notes.jsp	Page produces correct response (General Notes and Notes on Solution forms layout and input fields).	M. Kryshen	hand-written	passed

27.11.2003	statistics.jsp	Page produces correct response (Activity Statistics form layout and input fields).	M. Kryshen	hand-written	passed
27.11.2003	statistics.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
28.11.2003	process.jsp	Page produces correct response (Process an ANLDE System form layout and input fields).	M. Kryshen	hand-written	passed
28.11.2003	process.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
29.11.2003	processset.jsp	Page produces correct response (Process a Set of ANLDE Systems form layout and input fields).	M. Kryshen	hand-written	passed
29.11.2003	processset.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
01.12.2003	error-internal.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed
01.12.2003	error-user.jsp	Produced HTML code is valid HTML 4.01.	M. Kryshen	automatic	passed

2.2 Class ANLDEParser

Date	Module	Test case	Tester(s)	Type	Result
19.11.2003	parseANLDE()	Test case 1. Translate a simple (2x4)-test ANLDE system.	A. Salo	hand-written	passed
19.11.2003	parseANLDE()	Test case 2. Translate a simple (3x6)-test ANLDE system.	A. Salo	hand-written	passed
19.11.2003	parseANLDE()	Test case 3. Translate a test ANLDE system with one equation.	A. Salo	hand-written	passed

19.11.2003	parseANLDE()	Test case 4. Translate a test ANLDE system with one equation and empty right-hand side.	A. Salo	hand-written	passed
19.11.2003	parseANLDE()	Test case 5. Translate a test ANLDE system with double appearance of an unknown in a left-hand side.	A. Salo	hand-written	passed (ANLDE-FormatException is thrown)
20.11.2003	parseANLDE()	Test case 6. Translate a test ANLDE system with double appearance of an unknown in a left-hand side in the same equation.	A. Salo	hand-written	passed (ANLDE-FormatException is thrown)
20.11.2003	parseANLDE()	Test case 7. Translate a test ANLDE system with appearance of an unknown in a left-hand side with non-unit coefficient.	A. Salo	hand-written	passed (ANLDE-FormatException is thrown)
20.11.2003	parseANLDE()	Test case 8. Translate a large (equations, unknowns, coefficients) test ANLDE system.	A. Salo	semi-automatic (system template is generated by software)	passed
20.11.2003	parseANLDE()	Test case 8. Translate a large (equations, unknowns, coefficients) test ANLDE system.	A. Salo	semi-automatic (system template is generated by software)	passed

20.11.2003	parseANLDE()	Test case 8. Translate a large (equations, unknowns, coefficients) test ANLDE system.	A. Salo	semi-automatic (system template is generated by software)	passed
20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with double appearance of an unknown in a left-hand side.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)
20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with double appearance of an unknown in a left-hand side in the same equation.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)
20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with appearance of an unknown in a left-hand side with non-unit coefficient.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)
20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with equations limit exceeded.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)

20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with unknowns limit exceeded.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)
20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with coefficients limit exceeded.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)
20.11.2003	parseANLDE()	Test case 9. Translate a large ANLDE system with non-zero right-hand part of some equation.	A. Salo	semi-automatic (system template is generated by software)	passed (ANLDEFormatException is thrown)
22.11.2003	parseANLDE()	Test case 10. Translate a test ANLDE system which contains comments and blank lines.	A. Salo	hand-written	passed
26.11.2003	parseANLDE()	Test case 11. Translate a set of 3 simple test ANLDE systems.	A. Salo	hand-written	passed
26.11.2003	parseANLDE()	Test case 12. Translate a set of one test ANLDE system.	A. Salo	hand-written	passed
26.11.2003	parseANLDE()	Test case 13. Translate a typical (medium) set of medium test ANLDE systems.	A. Salo	semi-automatic (system set template is generated by software)	passed

27.11.2003	parseANLDE()	Test case 14. Translate a set of test ANLDE systems which contains non ANLDE system with double appearance of an unknown in a left-hand side.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 14. Translate a set of test ANLDE systems which contains non ANLDE system with double appearance of an unknown in a left-hand side in the same equation.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 14. Translate a set of test ANLDE systems which contains non ANLDE system with appearance of an unknown in a left-hand side with non-unit coefficient.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 15. Translate a set of test ANLDE systems with systems limit exceeded.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 15. Translate a set of test ANLDE systems which contains ANLDE system with unknowns limit exceeded.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)

27.11.2003	parseANLDE()	Test case 15. Translate a set of test ANLDE systems which contains ANLDE system with equations limit exceeded.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 15. Translate a set of test ANLDE systems which contains ANLDE system with coefficients limit exceeded.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 16. Translate large (systems) set of large (equations, unknowns, coefficients) test ANLDE systems.	A. Salo	semi-automatic (system set template is generated by software)	passed
27.11.2003	parseANLDE()	Test case 17. Translate a large (systems) set of large (equations, unknowns, coefficients) ANLDE systems in the incorrect format.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)
27.11.2003	parseANLDE()	Test case 18. Translate a test ANLDE system set which contains comments and blank lines.	A. Salo	semi-automatic (system set template is generated by software)	passed

27.11.2003	parseANLDE()	Test case 19. Translate a test ANLDE system set containing systems without equations.	A. Salo	semi-automatic (system set template is generated by software)	passed (ANLDEFormatException is thrown)

2.3 Class GaussGenerator

Date	Module	Test case	Tester(s)	Type	Result
20.11.2003	generate()	Test case 1. Generate a simple (3x6)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).
21.11.2003	generate()	Test case 2. Generate a standard (15x20)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out2`).
21.11.2003	generate()	Test case 3. Try to generate a test ANLDE system with incorrect limits (n¿m).	K. Kulakov	hand-written.	passed (ANLDE.error() called) (see file `out3`).
21.11.2003	generate()	Test case 4. Try to fail a generator.	K. Kulakov	hand-written.	passed (ANLDE.error() called) (see file `out4`).
21.11.2003	generateSet()	Test case 1. Generate a simple set of test ANLDE systems.	K. Kulakov	hand-written.	error: generator does not reply.
21.11.2003	generateSet()	Test case 1. Generate a simple set of test ANLDE systems.	K. Kulakov	hand-written.	passed (see file `out1`).
21.11.2003	generateSet()	Test case 2. Generate a set with one ANLDE system.	K. Kulakov	hand-written.	passed (see file `out2`).
21.11.2003	generateSet()	Test case 3. Fail in a generator.	K. Kulakov	hand-written.	passed (see file out3).

21.11.2003	generateSet()	Test case 4. Try to generate a large set.	K. Kulakov	hand-written.	Error: generator does not reply.
21.11.2003	generateSet()	Test case 4. Try to generate a large set.	K. Kulakov	hand-written.	Passed (exception OutOfMemoryError called) (see file `out4`).
21.11.2003	generateSet()	Test case 4. Try to generate a large set with 512Mb java heap size.	K. Kulakov	hand-written.	Passed (see file `out5`).
22.11.2003	generateSet()	Additional test case 1. Try to call ANLDE.error() method.	K. Kulakov	hand-written.	Passed (see file `out6`).
22.11.2003	generateSet()	Additional test case 2. Try to call ANLDE.generated() method.	K. Kulakov	hand-written.	Passed (see file `out7`).
22.11.2003	generate()	Additional test case 1. Try to call ANLDE.error() method.	K. Kulakov	hand-written.	Passed (see file `out5`).
22.11.2003	generate()	Additional test case 2. Try to call ANLDE.generated() method.	K. Kulakov	hand-written.	Error: generator does not reply.
22.11.2003	generate()	Additional test case 2. Try to call ANLDE.generated() method.	K. Kulakov	hand-written.	Passed (see file `out6`).

2.4 Class GordanoGenerator

Date	Module	Test case	Tester(s)	Type	Result
22.11.2003	generate()	Test case 1. Generate a simple (3x6)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).
22.11.2003	generate()	Test case 2. Generate a standard (15x20)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).
22.11.2003	generate()	Test case 3. Try to generate a test ANLDE system with incorrect limits (n¿m).	K. Kulakov	hand-written.	passed (ANLDE.error() called) (see file `out1`).

22.11.2003	generate()	Test case 4. Try to fail a generator (execution program absent).	K. Kulakov	hand-written.	passed (exception IOException called).
22.11.2003	generateSet()	Test case 1. Generate a simple set of test ANLDE systems.	K. Kulakov	hand-written.	Passed (see file `out1`).
22.11.2003	generateSet()	Test case 2. Generate a set with one ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).
22.11.2003	generateSet()	Test case 3. Fail in a generator.	K. Kulakov	hand-written.	passed (see file out1).
22.11.2003	generateSet()	Test case 4. Try to generate a large set.	K. Kulakov	hand-written.	Passed (exception OutOfMemoryError called).

2.5 Class AnldeSolver

Date	Module	Test case	Tester(s)	Type	Result
26.11.2003	solve()	Test case 1. Solving a simple (2x4)-test ANLDE system.	K. Kulakov	hand-written.	error: program couldn't found solver.
26.11.2003	solve()	Test case 1. Solving a simple (2x4)-test ANLDE system.	K. Kulakov	hand-written.	error: wrong temp file was founded.
26.11.2003	solve()	Test case 1. Solving a simple (2x4)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).
26.11.2003	solve()	Test case 2. Solving a medium (5x12)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out2`).
26.11.2003	solve()	Test case 3. Try to solving non-ANLDE system.	K. Kulakov	hand-written.	passed (see file `out3`).
26.11.2003	solve()	Test case 3. Try to solving incorrect ANLDE system with null fields.	K. Kulakov	hand-written.	passed (exception NullPointerException was called).
27.11.2003	solve()	Test case 4. Try to solving hard (100x150)-ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).

27.11.2003	solve()	Test case 5. Solve a set of simple test ANLDE systems.	K. Kulakov	hand-written.	passed (see file `out`).
27.11.2003	solve()	Test case 6. Solve a set with the only test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
27.11.2003	solve()	Test case 7. Solve a typical (medium) set with medium test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
27.11.2003	solve()	Test case 8. Solve hard ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
27.11.2003	solve()	Test case 9. Try to process a large set.	K. Kulakov	hand-written.	passed (see file `out`).
27.11.2003	solve()	Additional test case 1. Check memory limit.	K. Kulakov	hand-written.	passed (see file `out`).

2.6 Class SlopesSolver

Date	Module	Test case	Tester(s)	Type	Result
27.11.2003	solve()	Test case 1. Solving a simple (3x6)-test ANLDE system.	K. Kulakov	hand-written.	error: solver failure.
27.11.2003	solve()	Test case 1. Solving a simple (3x6)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 2. Solve a medium (15x10)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out1`).
28.11.2003	solve()	Test case 2. Solve a medium (5x7)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out2`).
28.11.2003	solve()	Test case 2. Solve a medium (3x7)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out3`).
28.11.2003	solve()	Test case 2. Solve a medium (5x10)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out4`).
28.11.2003	solve()	Test case 2. Solve a medium (5x7)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out5`).
28.11.2003	solve()	Test case 3. Try to solve wrong ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 4. Hard ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 5. Solve a set of simple test ANLDE systems.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 6. Solve a set with the only test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).

28.11.2003	solve()	Test case 7. Solve a typical (medium) set with medium test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 8. Try to solve a set with wrong ANDLE systems.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 9. Hard ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 10. Try to process a large set.	K. Kulakov	hand-written.	passed (see file `out`).

2.7 Class LpSolveSolver

Date	Module	Test case	Tester(s)	Type	Result
28.11.2003	solve()	Test case 1. Solving a simple (2x4)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 2. Solving a medium (5x12)-test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 3. Try to solving non-ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 4. Try to solving hard (100x150)-ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 5. Solve a set of simple test ANLDE systems.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 6. Solve a set with the only test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
28.11.2003	solve()	Test case 7. Solve a typical (medium) set with medium test ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
29.11.2003	solve()	Test case 8. Solve hard ANLDE system.	K. Kulakov	hand-written.	passed (see file `out`).
29.11.2003	solve()	Test case 9. Try to process a large set.	K. Kulakov	hand-written.	passed (see file `out`).

2.8 Class CheckSolutions

Date	Module	Test case	Tester(s)	Type	Result
01.12.2003	hilbertToHilbert()	Test case 1. Compare equal solutions.	K. Kulakov	hand-written.	passed (see file `out`).
01.12.2003	hilbertToHilbert()	Test case 2. Compare not equal solutions.	K. Kulakov	hand-written.	passed (see file `out`).

01.12.2003	solutionToHilbert()	Test case 3. Separate solution into Hilbert basis.	K. Kulakov	hand-written.	error: wrong variable used.
01.12.2003	solutionToHilbert()	Test case 3. Separate solution into Hilbert basis.	K. Kulakov	hand-written.	passed (see file `out`).
01.12.2003	solutionToHilbert()	Test case 4. Try to separate wrong solution into Hilbert basis.	K. Kulakov	hand-written.	passed (see file `out`).

2.9 Class GeneratorSpooler

Date	Module	Test case	Tester(s)	Type	Result
03.12.2003	getBufferCount()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	error: can't find properties.
03.12.2003	getBufferCount()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	error: can't find generator class.
03.12.2003	getBufferCount()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	passed (see file `out`).
03.12.2003	getGeneratorList()	Additional test case 1. Get list of generators.	K. Kulakov	hand-written.	passed (see file `out`).
04.12.2003	getBufferCount()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	error: wrong method was called.
04.12.2003	getBufferCount()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	passed (see file `out`).
04.12.2003	generateANLDESystem()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	error: executable file have wrong permissions.
04.12.2003	generateANLDESystem()	Test case 2. Empty buffer.	K. Kulakov	hand-written.	passed (see file `out`).
04.12.2003	getBufferCount()	Test case 1. Typical nonempty buffer.	K. Kulakov	hand-written.	passed (see file `out`).

04.12.2003	generateANLDESystem()	Test case 1. Empty buffer.	K. Kulakov	hand-written.	passed (see file `out`).
04.12.2003	generateANLDESystem()	Test case 3. Buffer is full.	K. Kulakov	hand-written.	passed (see file `out`).
04.12.2003	generateANLDESystemStr()	Test case 1. Typical nonempty buffer.	K. Kulakov	hand-written.	passed (see file `out`).

2.10 Class SolverSpooler

Date	Module	Test case	Tester(s)	Type	Result
05.12.2003	getSolverList()	Additional test case 1. Get list of solvers.	K. Kulakov	hand-written.	passed (see file `out`).

2.11 Class GeneratorOutputParser

Date	Module	Test case	Tester(s)	Type	Result
28.11.2003	parseANLDE(source, limits, anlde)	Test case 1. Parse one small correct ANLDE system from generator output (try 1).	A. Anan'in	hand-written.	error: Generator failed. Wrong parameter calling.
28.11.2003	parseANLDE(source, limits, anlde)	Test case 1. Parse one small correct ANLDE system from generator output (try 2).	A. Anan'in	hand-written.	error: Generator failed. Wrong dimension of left part vector.
28.11.2003	parseANLDE(source, limits, anlde)	Test case 1. Parse one small correct ANLDE system from generator output (try 2).	A. Anan'in	hand-written.	error: Generator failed. Wrong parameter in constructor ANLDESystem.
28.11.2003	parseANLDE(source, limits, anlde)	Test case 1. Parse one small correct ANLDE system from generator output (try 3).	A. Anan'in	hand-written.	passed.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 2. Parse one medium correct ANLDE system from generator output.	A. Anan'in	hand-written.	passed.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 3. Parse one medium correct ANLDE system from generator output.	A. Anan'in	hand-written.	passed.

29.11.2003	parseANLDE(source, limits, anlde)	Test case 4. Try to parse one ANLDE system with incorrect limits (try 1).	A. Anan'in	hand-written.	error: Generator failed. Wrong catching of exception.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 4. Try to parse one ANLDE system with incorrect limits (try 2).	A. Anan'in	hand-written.	passed: Bad limits exception.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 5. Try to parse fail generator output; blank output.	A. Anan'in	hand-written.	passed: Generator failed exception.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 6. Try to parse fail generator output; incorrect output.	A. Anan'in	hand-written.	passed: Generator failed exception.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 7. Try to parse fail generator output; number of solution exceeded user limit.	A. Anan'in	hand-written.	passed: Bad limits exception.
29.11.2003	parseANLDE(source, limits, anlde)	Test case 8. Try to parse fail generator output; lack of memory.	A. Anan'in	hand-written.	passed: Generator failed exception.
01.12.2003	parseANLDE(source, limits, anlde)	Test case 9. Parse one ANLDE system; n = m = 1.	A. Anan'in	hand-written.	passed.
01.12.2003	parseANLDE(source, limits, anlde)	Test case 10. Parse one ANLDE system; n = m.	A. Anan'in	hand-written.	passed.
01.12.2003	parseANLDE(source, limits, anlde)	Test case 11. Parse one ANLDE system; one equation, solutions limit exceeded.	A. Anan'in	hand-written.	passed: Bad limits exception.
01.12.2003	parseANLDE(source, limits, anlde)	Test case 12. Parse one ANLDE system; more than one equation, solutions limit exceeded.	A. Anan'in	hand-written.	passed: Bad limits exception.

2.12 Class BaseSolverOutputParser

Date	Module	Test case	Tester(s)	Type	Result
03.12.2003	parseOutcome(source, limits, size)	Test case 1. Parse one correct solution and metrics from solver output (try 1).	A. Anan'in	hand-written.	error: Wrong format exception. Wrong iteration calling.
03.12.2003	parseOutcome(source, limits, size)	Test case 1. Parse one typical correct solution and metrics from solver output (try 2).	A. Anan'in	hand-written.	passed.
03.12.2003	parseOutcome(source, limits, size)	Test case 2. Parse one standard correct solution and metrics from solver output (try 1).	A. Anan'in	hand-written.	error: Wrong format exception. Wrong size
03.12.2003	parseOutcome(source, limits, size)	Test case 2. Parse one standard correct solution and metrics from solver output (try 2).	A. Anan'in	hand-written.	passed.
03.12.2003	parseOutcome(source, limits, size)	Test case 3. Parse one standard correct solution and metrics from solver output; ANLDE system is NxN;	A. Anan'in	hand-written.	passed.
03.12.2003	parseOutcome(source, limits, size)	Test case 4. Parse solver result with 0 solution.	A. Anan'in	hand-written.	passed.
03.12.2003	parseOutcome(source, limits, size)	Test case 5. Try to parse special solver termination.	A. Anan'in	hand-written.	passed.

2.13 Class Lp-solveOutputParser

Date	Module	Test case	Tester(s)	Type	Result
04.12.2003	parseANLDE(source, limits, size)	Test case 1. Parse correct typical solution of ANLDE system solver output (try 1).	A. Anan'in	hand-written.	error: Wrong format exception. Wrong iterations.

04.12.2003	parseANLDE(source, limits, size)	Test case 1. Parse correct typical solution of ANLDE system solver output (try 2).	A. Anan'in	hand-written.	passed.
04.12.2003	parseANLDE(source, limits, size)	Test case 3. Parse correct standard solution of ANLDE system solver output.	A. Anan'in	hand-written.	passed.
04.12.2003	parseANLDE(source, limits, size)	Test case 4. Parse solution of ANLDE system solver output with no solutions.	A. Anan'in	hand-written.	passed.
04.12.2003	parseANLDE(source, limits, size)	Test case 4. Try to parse correct standard solution of ANLDE system solver output; wrong limits.	A. Anan'in	hand-written.	passed.

2.14 Class UserProfileStore

Date	Module	Test case	Tester(s)	Type	Result
15.11.2003	getUserProfile()	Test case 1. Get user profile: small values for limits.	A. Anan'in	hand-written.	passed.
15.11.2003	getUserProfile()	Test case 1. Get user profile: medium values for limits.	A. Anan'in	hand-written.	passed.
15.11.2003	getUserProfile()	Test case 1. Get user profile: big values for limits.	A. Anan'in	hand-written.	passed.
15.11.2003	getUserProfile()	Test case 2. Get user profile: file does not exist.	A. Anan'in	hand-written.	passed: FileNotFoundException.
15.11.2003	getUserProfile()	Test case 3. Get user profile: input file has wrong limits values.	A. Anan'in	hand-written.	passed: NumberFormatException.
17.11.2003	setUserProfile()	Test case 1. Save user profile: small values for limits.	A. Anan'in	hand-written.	passed.
17.11.2003	setUserProfile()	Test case 1. Save user profile: medium values for limits.	A. Anan'in	hand-written.	passed.

17.11.2003	setUserProfile()	Test case 1. Save user profile: big values for limits.	A. Anan'in	hand-written.	passed.
17.11.2003	removeUserProfile()	Test case 1. Remove any user profile data file.	A. Anan'in	hand-written.	passed.
17.11.2003	removeUserProfile()	Test case 2. Try to remove user profile data file; user do not have access to the user profile data file.	A. Anan'in	hand-written.	passed: IOException.

2.15 Class DefaultLimitsStore

Date	Module	Test case	Tester(s)	Type	Result
17.11.2003	getDefaultLimits()	Test case 1. Get default limits: small values for limits.	A. Anan'in	hand-written.	passed.
17.11.2003	getDefaultLimits()	Test case 1. Get default limits: medium values for limits.	A. Anan'in	hand-written.	passed.
17.11.2003	getDefaultLimits()	Test case 1. Get default limits: big values for limits.	A. Anan'in	hand-written.	passed.
27.11.2003	getDefaultLimits()	Test case 2. Try to get default limits; the default limits file does not exist.	A. Anan'in	hand-written.	passed.
27.11.2003	getDefaultLimits()	Test case 3. Try to get default limits; the default limits have wrong format.	A. Anan'in	hand-written.	passed.
27.11.2003	setDefaultLimits()	Test case 1. Save default limits.	A. Anan'in	hand-written.	passed.
27.11.2003	setDefaultLimits()	Test case 2. Try to save default limits; the default limits file does not have access.	A. Anan'in	hand-written.	passed.

2.16 Class StatisticsStore

Date	Module	Test case	Tester(s)	Type	Result
19.11.2003	getStatistics()	Test case 1. Get activity statistics.	A. Anan'in	hand-written.	passed.

20.11.2003	getStatistics()	Test case 2. Try to get activity statistics; log file does not exist.	A. Anan'in	hand-written.	passed: FileNotFoundException.
20.11.2003	getStatistics()	Test case 3. Try to get activity statistics; number values have wrong format.	A. Anan'in	hand-written.	passed: NumberFormatException.
21.11.2003	getStatistics()	Test case 3. Try to get activity statistics; IP address has wrong format.	A. Anan'in	hand-written.	passed: exception
11.12.2003	getStatistics()	Test case 4. Try to get activity statistics; blank activity statistics file.	A. Anan'in	hand-written.	passed: exception
11.12.2003	getStatistics()	Test case 5. Try to get activity statistics; one commentary line.	A. Anan'in	hand-written.	passed: exception
21.11.2003	setStatistics()	Test case 1. Save activity statistics; activity statistics file does not exist.	A. Anan'in	hand-written.	passed.
21.11.2003	setStatistics()	Test case 1. Add activity statistics in the file; activity statistics file exist.	A. Anan'in	hand-written.	passed.
21.11.2003	setStatistics()	Test case 2. Try to add activity statistics; wrong IP address in input data.	A. Anan'in	hand-written.	passed: exception.

2.17 Class Management

Date	Module	Test case	Tester(s)	Type	Result
22.11.2003	getUserProfile(nickname, password)	Test case 1. Get user profile with correct password (try 1).	A. Anan'in	hand-written.	error: FileNotFoundException.
22.11.2003	getUserProfile(nickname, password)	Test case 1. Repeat previous test(try 2): Get user profile with correct password.	A. Anan'in	hand-written.	passed: wrong constructor calling.
22.11.2003	getUserProfile(nickname, password)	Test case 2. Try to get user profile; The password is wrong.	A. Anan'in	hand-written.	passed.
22.11.2003	getUserProfile(nickname, password)	Test case 3. Try to get user profile; some of user limits are bigger than default limits.	A. Anan'in	hand-written.	passed.

22.11.2003	getUserProfile(nickname)	Test case 1. Get standard user profile.	A. Anan'in	hand-written.	passed.
22.11.2003	getUserProfile(nickname)	Test case 2. Try to get user profile; some of user limits are bigger than default limits.	A. Anan'in	hand-written.	passed.
22.11.2003	setUserProfile(userprofile)	Test case 1. Save correct user profile.	A. Anan'in	hand-written.	passed.
22.11.2003	setUserProfile(userprofile)	Test case 2. Try to save user profile; user limits are bigger than default limits;	A. Anan'in	hand-written.	passed.
26.11.2003	sendNotes(note, anlde, admemail, userProfile)	Test case 1. Send email message to the system administrator.	A. Anan'in	hand-written.	passed.

3 Integration Testing

Integration test specifications are provided in section 4 *Integration Testing* of the Test Plan [5]. The goal is to exercise systematically all key combinations of subsystems (clusters) to uncover errors and defects associated with subsystem interfaces. Bottom-up incremental integration is used.

3.1 Web server—ANLDE parser

Date	Feature	Test case	Tester(s)	Type	Result
05.12.2003	Parse ANLDE system.	Test case 1. Translate a simple (3x6)-test ANLDE system.	A. Salo	hand-written	passed
05.12.2003	Parse ANLDE system.	Test case 2. Translate a large (equations, unknowns, coefficients) test ANLDE system.	A. Salo	semi-automatic	passed
05.12.2003	Parse ANLDE system.	Test case 3. Translate a test ANLDE system with double appearance of an unknown in a left-hand side.	A. Salo	hand-written	passed (error message is shown)

06.12.2003	Parse ANLDE system.	Test case 4. Translate a test ANLDE system which contains comments and blank lines.	A. Salo	hand-written	passed
06.12.2003	Parse ANLDE system.	Test case 5. Translate a set of 3 simple test ANLDE systems.	A. Salo	hand-written	passed
06.12.2003	Parse ANLDE system.	Test case 6. Translate a set of one test ANLDE system.	A. Salo	hand-written	passed
06.12.2003	Parse ANLDE system.	Test case 7. Translate a large (systems) set of large (equations, unknowns, coefficients) test ANLDE systems.	A. Salo	semi-automatic	passed
06.12.2003	Parse ANLDE system.	Test case 8. Translate a set of test ANLDE systems with systems limit exceeded.	A. Salo	semi-automatic	passed (error message is shown)
06.12.2003	Parse ANLDE system.	Test case 9. Translate a test ANLDE system set containing systems without equations.	A. Salo	semi-automatic	passed (error message is shown)
06.12.2003	Parse ANLDE system.	Test case 10. Translate a test ANLDE system set which contains comments and blank lines.	A. Salo	semi-automatic	passed

3.2 Web server—ActivityStatistics

Date	Feature	Test case	Tester(s)	Type	Result
18.12.2003	Get statistics report.	Test case 1. Process typical log file.	A. Salo	hand-written	passed
18.12.2003	Get statistics report.	Test case 2. Process log file containing only one record.	A. Salo	hand-written	passed
18.12.2003	Get statistics report.	Test case 3. Process log file containing records with the same domain.	A. Salo	hand-written	passed
18.12.2003	Get statistics report.	Test case 4. Process log file which has wrong format.	A. Salo	hand-written	passed (internal error page is displayed)
18.12.2003	Get statistics report.	Test case 5. Process non-existing log file.	A. Salo	hand-written	passed (internal error page is displayed)

18.12.2003	Get statistics report.	Test case 6. Process empty log file.	A. Salo	hand-written	passed (internal error page is displayed)
18.12.2003	Get statistics report.	Test case 7. Process log file containing only one line (treated as comment).	A. Salo	hand-written	passed (internal error page is displayed)
18.12.2003	Write statistics data.	Write statistics data to StatisticsStore.	A. Salo	automatic	passed
18.12.2003	Write statistics data.	Write statistics data to StatisticsStore (after request to servlet (except main.jsp) when session is inactive).	A. Salo	automatic	failed (null was written instead of ip address)
19.12.2003	Write statistics data.	Write statistics data to StatisticsStore (after request to servlet (except main.jsp) when session is inactive).	A. Salo	automatic	passed
19.12.2003	Write statistics data.	Write statistics data to StatisticsStore (after session ending by timeout).	A. Salo	automatic	failed (no data written)
19.12.2003	Write statistics data.	Write statistics data to StatisticsStore (after session ending by timeout).	A. Salo	automatic	passed

3.3 ActivityStatistics—DataStore

Date	Feature	Test case	Tester(s)	Type	Result
03.12.2003	Get statistics data.	Test case 1. Process typical log file.	A. Salo	hand-written	passed
03.12.2003	Get statistics data.	Test case 2. Process log file containing only one record.	A. Salo	hand-written	passed
03.12.2003	Get statistics data.	Test case 3. Process log file containing records with the same domain.	A. Salo	hand-written	passed
03.12.2003	Get statistics data.	Test case 4. Process log file which has wrong format.	A. Salo	hand-written	passed (Exception is thrown)
03.12.2003	Get statistics data.	Test case 5. Process non-existing log file.	A. Salo	hand-written	passed (Exception is thrown)

3.4 Generator—GeneratorOutputParser

Date	Feature	Test case	Tester(s)	Type	Result
06.12.2003	Gauss generator	Test case 1 Generating an simple ANLDE system.	K. Kulakov	hand-written.	passed

06.12.2003	Gauss generator	Test case 2 Generating a set of ANLDE systems.	K. Kulakov	hand-written	Error: NullPointerException was called.
06.12.2003	Gauss generator	Test case 2 Generating a set of ANLDE systems.	K. Kulakov	hand-written.	passed.
06.12.2003	Gauss generator	Test case 3 Generating ANLDE system with small limits.	K. Kulakov	hand-written	passed (IOException was called).
06.12.2003	Gauss generator	Test case 4 Generating a set of ANLDE systems with small limits.	K. Kulakov	hand-written.	passed (IOException was called).
06.12.2003	Gauss generator	Test case 5 Generating a large ANLDE system.	K. Kulakov	hand-written	passed.
06.12.2003	Gauss generator	Test case 6 Generating a large set of ANLDE systems.	K. Kulakov	hand-written	passed.
06.12.2003	Gordano generator	Test case 1 Generating an simple ANLDE system.	K. Kulakov	hand-written	passed
06.12.2003	Gordano generator	Test case 2 Generating a set of ANLDE systems.	K. Kulakov	hand-written	passed.
06.12.2003	Gordano generator	Test case 3 Generating ANLDE system with small limits.	K. Kulakov	hand-written	passed (IOException was called).
06.12.2003	Gordano generator	Test case 4 Generating a set of ANLDE systems with small limits.	K. Kulakov	hand-written	passed (IOException was called).
06.12.2003	Gordano generator	Test case 5 Generating a large ANLDE system.	K. Kulakov	hand-written	passed.
06.12.2003	Gordano generator	Test case 6 Generating a large set of ANLDE systems.	K. Kulakov	hand-written	passed.

3.5 Solver—SolverOutputParser

Date	Feature	Test case	Tester(s)	Type	Result
08.12.2003	anlde solver.	Test case 1 Solving and parsing standard ANLDE system.	K. Kulakov	hand-written.	passed.
08.12.2003	anlde solver.	Test case 2 Solving and parsing a set of standard ANLDE systems.	K. Kulakov	hand-written.	passed.

08.12.2003	anlde solver.	Test case 3 Try to solve and parse large ANLDE system.	K. Kulakov	hand-written.	passed.
08.12.2003	anlde solver.	Test case 4 Try to solve and parse large set of ANLDE systems.	K. Kulakov	hand-written.	passed.
08.12.2003	anlde solver.	Test case 5 Try to solve and parse ANLDE system with wrong limits.	K. Kulakov	hand-written.	passed.
08.12.2003	anlde solver.	Test case 6 Try to solve and parse a set of ANLDE systems with wrong limits.	K. Kulakov	hand-written.	passed.
10.12.2003	slopes solver.	Test case 1 Solving and parsing standard ANLDE system.	K. Kulakov	hand-written.	passed.
10.12.2003	slopes solver.	Test case 2 Solving and parsing a set of standard ANLDE systems.	K. Kulakov	hand-written.	passed.
10.12.2003	slopes solver.	Test case 3 Try to solve and parse large ANLDE system.	K. Kulakov	hand-written.	passed (IOException: "Wrong format." was called).
10.12.2003	slopes solver.	Test case 4 Try to solve and parse large set of ANLDE systems.	K. Kulakov	hand-written.	passed (IOException: "Wrong format." was called).
10.12.2003	slopes solver.	Test case 5 Try to solve and parse ANLDE system with wrong limits.	K. Kulakov	hand-written.	passed (IOException: "Wrong format." was called).
10.12.2003	slopes solver.	Test case 6 Try to solve and parse a set of ANLDE systems with wrong limits.	K. Kulakov	hand-written.	passed (IOException: "Wrong format." was called).
10.12.2003	LpSolve solver.	Test case 1 Solving and parsing standard ANLDE system.	K. Kulakov	hand-written.	passed.
10.12.2003	LpSolve solver.	Test case 2 Solving and parsing a set of standard ANLDE systems.	K. Kulakov	hand-written.	Error: class Solver added unusable information into the solver outcome.

10.12.2003	LpSolve solver.	Test case 2 Solving and parsing a set of standard ANLDE systems.	K. Kulakov	hand-written.	passed.
10.12.2003	LpSolve solver.	Test case 3 Try to solve and parse large ANLDE system.	K. Kulakov	hand-written.	passed (Time limit exceeded).
10.12.2003	LpSolve solver.	Test case 4 Try to solve and parse large set of LpSolve systems.	K. Kulakov	hand-written.	passed.
10.12.2003	LpSolve solver.	Test case 5 Try to solve and parse LpSolve system with wrong limits.	K. Kulakov	hand-written.	passed (Memory limit exceeded).
10.12.2003	LpSolve solver.	Test case 6 Try to solve and parse a set of LpSolve systems with wrong limits.	K. Kulakov	hand-written.	passed (Memory limit exceeded).

3.6 SolverSpooler—Solver—*

Date	Feature	Test case	Tester(s)	Type	Result
11.12.2003	solveANLDE.	Test case 1 Solving standard ANLDE system using main solver.	K. Kulakov	hand-written.	Error: can't print SolverOutcome object.
11.12.2003	solveANLDE.	Test case 1 Solving standard ANLDE system using main solver.	K. Kulakov	hand-written.	passed.
13.12.2003	solveANLDE.	Test case 2 Solving set of standard ANLDE systems using main solver.	K. Kulakov	hand-written.	error: wrong ANLDE system statistics.
13.12.2003	solveANLDE.	Test case 2 Solving set of standard ANLDE systems using main solver.	K. Kulakov	hand-written.	passed.
13.12.2003	solveANLDE.	Test case 3 Solving standard ANLDE system using set of solvers.	K. Kulakov	hand-written.	error: can't find order solvers.
13.12.2003	solveANLDE.	Test case 3 Solving standard ANLDE system using set of solvers.	K. Kulakov	hand-written.	error: can't get information about order solvers.
13.12.2003	solveANLDE.	Test case 3 Solving standard ANLDE system using set of solvers.	K. Kulakov	hand-written.	passed.

13.12.2003	solveANLDE.	Test case 4 Solving a set of standard ANLDE systems using set of solvers.	K. Kulakov	hand-written.	passed.
13.12.2003	solveANLDE.	Additional test case 1 Solving a set of ANLDE systems when same solvers can't solve same tasks.	K. Kulakov	hand-written.	passed.

3.7 Spooler—Solver—SolverOutputParser—TestSolution

Date	Feature	Test case	Tester(s)	Type	Result
15.12.2003	hilbertToHilbert.	Test case 1 Compares equal Hilbert bases.	K. Kulakov	hand-written.	passed.
15.12.2003	hilbertToHilbert.	Test case 2 Compares not equal Hilbert bases.	K. Kulakov	hand-written.	passed.
15.12.2003	solutionToHilbert.	Test case 1 Decomposition correct solution into Hilbert basis.	K. Kulakov	hand-written.	passed.
15.12.2003	solutionToHilbert.	Test case 2 Decomposition incorrect solution into Hilbert basis.	K. Kulakov	hand-written.	passed.

3.8 Spooler—Generator—*

Date	Feature	Test case	Tester(s)	Type	Result
11.12.2003	Gauss generator, generate ANLDE system.	Test case 1 Generating an parsing simple ANLDE system; one task.	A. Ananin	semi-automatic.	passed
11.12.2003	Gordano generator, generate ANLDE system.	Test case 1 Generating an parsing simple ANLDE system; one task.	A. Ananin	semi-automatic.	passed
11.12.2003	Gauss generator, generate ANLDE system.	Test case 1 Generating an parsing simple ANLDE system; few tasks.	A. Ananin	semi-automatic.	passed
11.12.2003	Gordano generator, generate ANLDE system.	Test case 1 Generating an parsing simple ANLDE system; few tasks.	A. Ananin	semi-automatic.	passed
11.12.2003	Gauss generator, generate ANLDE system.	Test case 1 Generating an parsing simple ANLDE system; big number of tasks.	A. Ananin	semi-automatic.	passed
11.12.2003	Gordano generator, generate ANLDE system.	Test case 1 Generating an parsing simple ANLDE system; big number of tasks.	A. Ananin	semi-automatic.	passed

13.12.2003	Gauss generator, generate ANLDE system.	Test case 7 Generating an parsing simple ANLDE system; size of buffer is smaller than number of tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gordano generator, generate ANLDE system.	Test case 7 Generating an parsing simple ANLDE system; size of buffer is smaller than number of tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gauss generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; one task.	A. Ananin	semi-automatic.	passed
13.12.2003	Gordano generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; one task.	A. Ananin	semi-automatic.	passed
13.12.2003	Gauss generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; few tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gordano generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; few tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gauss generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; big number of tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gordano generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; big number of tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gauss generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; size of buffer is smaller than number of tasks.	A. Ananin	semi-automatic.	passed
13.12.2003	Gordano generator, generate a set of ANLDE systems.	Test case 1 Generating an parsing simple set of ANLDE systems; size of buffer is smaller than number of tasks.	A. Ananin	semi-automatic.	passed

3.9 Web server—Algorithm server—*

Date	Feature	Test case	Tester(s)	Type	Result
15.12.2003	get generators list.	Test case 1. Get generators list from algorithm server.	K. Kulakov	hand-written	Error: can't load generators

15.12.2003	get generators list.	Test case 1. Get generators list from algorithm server.	K. Kulakov	hand-written	passed
15.12.2003	get solvers list.	Test case 1. Get solvers list from algorithm server.	K. Kulakov	hand-written	passed
17.12.2003	generate ANLDE.	Test case 1. generate an ANLDE system.	K. Kulakov	hand-written	Error: can't get ANLDE system
17.12.2003	generate ANLDE.	Test case 1. generate an ANLDE system.	K. Kulakov	hand-written	Error: can't execute algorithm
17.12.2003	generate ANLDE.	Test case 1. generate an ANLDE system.	K. Kulakov	hand-written	Error: error in method's name
17.12.2003	generate ANLDE.	Test case 1. generate an ANLDE system.	K. Kulakov	hand-written	Error: passed
17.12.2003	generate ANLDE.	Test case 2. generate a set of ANLDE systems.	K. Kulakov	hand-written	passed
17.12.2003	generate ANLDE.	Test case 1. generate an ANLDE system.	K. Kulakov	hand-written	Error: comment same necessary strings
17.12.2003	generate ANLDE.	Test case 1. generate an ANLDE system.	K. Kulakov	hand-written	passed
18.12.2003	generate ANLDE.	Test case 2. generate a set of ANLDE systems.	K. Kulakov	hand-written	Can't report about generating.
18.12.2003	generate ANLDE.	Test case 2. generate a set of ANLDE systems.	K. Kulakov	hand-written	passed.
18.12.2003	solve ANLDE.	Test case 1. solve an ANLDE system.	K. Kulakov	hand-written	Error: can't find execution algorithm.
18.12.2003	solve ANLDE.	Test case 1. solve an ANLDE system.	K. Kulakov	hand-written	Error: can't execute algorithm.
18.12.2003	solve ANLDE.	Test case 1. solve an ANLDE system.	K. Kulakov	hand-written	passed.
18.12.2003	solve ANLDE.	Test case 2. solve a set of ANLDE systems.	K. Kulakov	hand-written	passed.
18.12.2003	solve ANLDE.	Test case 1. solve an ANLDE system.	K. Kulakov	hand-written	Error: abnormal algorithm termination.

18.12.2003	solve ANLDE.	Test case 1. solve an ANLDE system.	K. Kulakov	hand-written	passed.

3.10 WebServer—Management—DataStore

Date	Feature	Test case	Tester(s)	Type	Result
18.12.2003	Get user profile (with password checking.	Login. Log a registered user (test) in.	M. Kryshen.	hand-written.	passed.

4 Validation Testing

Validation testing is the highest-level testing of the product, performing to ensure all features of the web system meet their requirements. The goal is to exercise on the behavior and the advanced functionality of the whole web system. User scenarios will be executed against the web system. This includes functional, performance, security, and acceptance test cases.

Validation test specifications are provided in section 5 *Validation Testing* of the Test Plan [5]. Validation criteria are specified in the Requirements Specification [4].

4.1 Session

Date	Test case	Tester(s)	Type	Result
15.12.2003	Test case 1 Start session.	A. Anan'in	hand-written.	passed.
15.12.2003	Test case 2 Work during session.	A. Anan'in	hand-written.	passed.
17.12.2003	Test case 3 Work during session.	A. Anan'in	hand-written.	passed.
17.12.2003	Test case 4 Session interrupt.	A. Anan'in	hand-written.	passed.
17.12.2003	Test case 5 Simultaneous browser windows; cookies are enabled.	A. Anan'in	hand-written.	passed.
17.12.2003	Test case 5 Simultaneous browser windows; cookies are disabled.	A. Anan'in	hand-written.	passed.
17.12.2003	Test case 7 Same session ID.	A. Anan'in	hand-written.	passed.

4.2 Process an ANLDE system

Date	Test case	Tester(s)	Type	Result

18.12.2003	Test case 4. Solve ANLDE system.	A. Anan'in	hand-written.	error: incorrect reloading "Content" area. ';' problem in MS IE URL is fixed.
18.12.2003	Test case 4. Solve ANLDE system; standard ANLDE system.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 2. ANLDE inputting; manual inputting.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 2. ANLDE inputting; generating: one simple ANLDE system.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 2. ANLDE inputting; generating: one big ANLDE system.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 2. ANLDE inputting; generating: few big ANLDE systems as different tasks.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 1. Process form.	A. Anan'in	hand-written.	passed.

4.3 Process a set of ANLDE system

Date	Test case	Tester(s)	Type	Result
19.12.2003	Test case 1. Process form.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 2. Inputting ANLDE systems; generation.	A. Anan'in	hand-written.	passed.
19.12.2003	Test case 2. Inputting ANLDE systems; input from file.	A. Anan'in	hand-written.	error: NullPointerException.
20.12.2003	Test case 2. Inputting ANLDE systems; input from file. Try 2.	A. Anan'in	hand-written.	passed.

4.4 Log In

Date	Test case	Tester(s)	Type	Result
17.12.2003	Test case 1 Log In.	A. Anan'in	hand-written.	passed.
17.12.2003	Test case 2 Log Out.	A. Anan'in	hand-written.	passed.

4.5 Send a note

Date	Test case	Tester(s)	Type	Result
17.12.2003	Test case 1 General notes.	A. Anan'in	hand-written.	passed.

4.6 Register a user

Date	Test case	Tester(s)	Type	Result
18.12.2003	Test case 1 Load registration form.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Register a user.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Try to register a user; obligatory fields are not filled.	A. Anan'in	hand-written.	passed.

4.7 Manage user limits

Date	Test case	Tester(s)	Type	Result
18.12.2003	Test case 1 Initialize management of user limits.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Change and submit user limits; not registered user.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Change and submit user limits; not registered user; input values are bigger than default limits.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Change and submit user limits; registered user.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Change and submit user limits; registered user; input values are bigger than default limits.	A. Anan'in	hand-written.	passed.

4.8 Manage users

Date	Test case	Tester(s)	Type	Result
18.12.2003	Test case 1 Initialize management of users.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Load user information form.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 3 Change and submit user information.	A. Anan'in	hand-written.	passed.

4.9 Manage default limits

Date	Test case	Tester(s)	Type	Result
18.12.2003	Test case 1 Initialize management of default limits.	A. Anan'in	hand-written.	passed.

18.12.2003	Test case 2 Change and submit user limits; not registered user.	A. Anan'in	hand-written.	passed.

4.10 Get statistics

Date	Test case	Tester(s)	Type	Result
18.12.2003	Test case 1 IP address domain.	A. Anan'in	hand-written.	passed.
18.12.2003	Test case 2 Nickname domain.	A. Anan'in	hand-written.	passed.

5 System Testing

For this project the system testing consists of variations of alpha- and beta-testing [8, 9]. The goal is to exercise the web system in real or almost real environments with different conditions. It includes usability, stress, and security testing.

5.1 Alpha-testing

For this testing sophomore and junior students of the PetrSU CSDept are attracted.

5.1.1 First stage

The first stage of the alpha-testing was started at 16.01.2004 and was finished at 18.01.2004. There were 58 students.

This alpha-testing was executed with the full-scale copy of the Web-SynDic without documentation part. All students were divided into 6 groups and each group tests Web-SynDic about 1 hour 30 minutes.

Before starting the test the technical manager (Kirill Kulakov) make short introduction to the Web-SynDic system. During the testing period all members may ask the technical manager about Web-SynDic. If the member finds a error or wants to make an opinion, then she/he tells this to the technical manager and also sends the note to administrator about this problem.
Execution results: During the testing period the Web-SynDic server was reloaded 5 times. The short description of found flaws, given testers' proposals, technical manager comments and information about fixation this problem is given in the following table.

Problem description	Technical manager comments	Information about fixation
After input ANLDE system and click solve button the page forward request to the arbitrary page.	This problem situated only one computer and it is possible that it may be infect with computer virus.	Project team try to repeat this situation but was not get this result.
If user sent request for generating system like 5 equations and 10 unknowns the web server fault.	The generator classes did not check that equations must be greater than unknowns.	Fixed.
On registration process Web-SynDic did not check correctly e-mail field.	After discussion between team members we decide that e-mail must contain symbol '@', before and after this symbol must be non-empty string.	In progress.
If browser did not work with cookie and user open 2 window then in first window we input ANLDE system with 6 equations. In second window we change user limits: the number of equations from 3 to 6 and commit it. Then we moved into the first window and send request for solving this ANLDE system. The server answer that the number of equations exceeded limit value".	Needed check Web-SynDic work without cookie supports.	In progress.

User can send empty note.	The Web-SynDic did not check that note not empty.	Fixed.

Web-SynDic can not solve this ANLDE system:
 	
`x1 = 2*x1 + x3`
`x2 = 2*x1 + x3`
`x3 = 2*x1 + x3`
`x4 = 2*x1 + x3`
 	
When request for solving was send the server did not answered.
	It is possible that member send request for solving this system when server was fault.	We check this system and server solve it.

If user save the ANLDE system into the file and try to load this file into the server the Web-SynDic give out error message about wrong format of ANLDE system.	When the Web-SynDic saved ANLDE system into the file it added same symbols before the system.	Fixed.
If in the browser properties the forwarding was disabled then in solving process the report on solution did not printed.	The process page must contain link for open next page and if browser can not forward request for next page user can open it.	Fixed.
If the ANLDE system contain large coefficient like 50000000000000000000000 the server receive Internal Error page.	The parser did not check large coefficients.	Fixed.
If user input incorrect ANLDE system and send request for solving ANLDE system, the server receive error message and previous ANLDE system.	It is Web-SynDic feature.	Not needed to fixed.
When the user click auto agree button then the Web-SynDic make logout.	The link for auto agree button was wrong.	Fixed.
If user want to process with a set of ANLDE systems and load file the check box “Load a set from a text file” did not focused.	After discussion between team members we decide that page “process with a set of ANLDE systems” must be changed.	In progress.

In the header of all pages the link "Department of computer science" points to the Russian page.	This page is default in this site.	Fixed.
If user input coefficient like 0000 the system did not send error message.	This is Web-SynDic feature.	Not needed to fixed.
For change user password did not required input old password.	For registered users changing password and removing account must be able after user input old password.	In processing.
If all limit values is 1 then if user send request for generating and solving a set of ANLDE system the server receive empty error message.	After generating process was ended the Web-SynDic did not check result of generating process. And if generating process was failed then solving process was failing too and server send empty error message.	Fixed.
If user input wrong link into the command line like ".../main.jsp?page=" the server receive Internal Error page.	The main page did not check parameters.	Fixed.

5.1.2 Second stage

The second stage will be the Microsoft Contest–Conference in SPbSTU on 3–5.03.2004.

5.1.3 Third stage

According with the Project Plan this stage will be in the middle of March, 2004. It is supposed to attract again students of PetrSU CSDept and also several researches in the area.

5.2 Beta-testing

The execution of this testing will start after deployment the Web-SynDic system in the Internet for public access. According with the Project Plan [1] this will happen in April–May 2004.