COMBINATIONS MINIMIZER

An Overview (23-SEP-2013), Heiko Schmitt

CONTENT

- Problem
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PROBLEM

- **Given**
  A system with a high number of variables and parameters

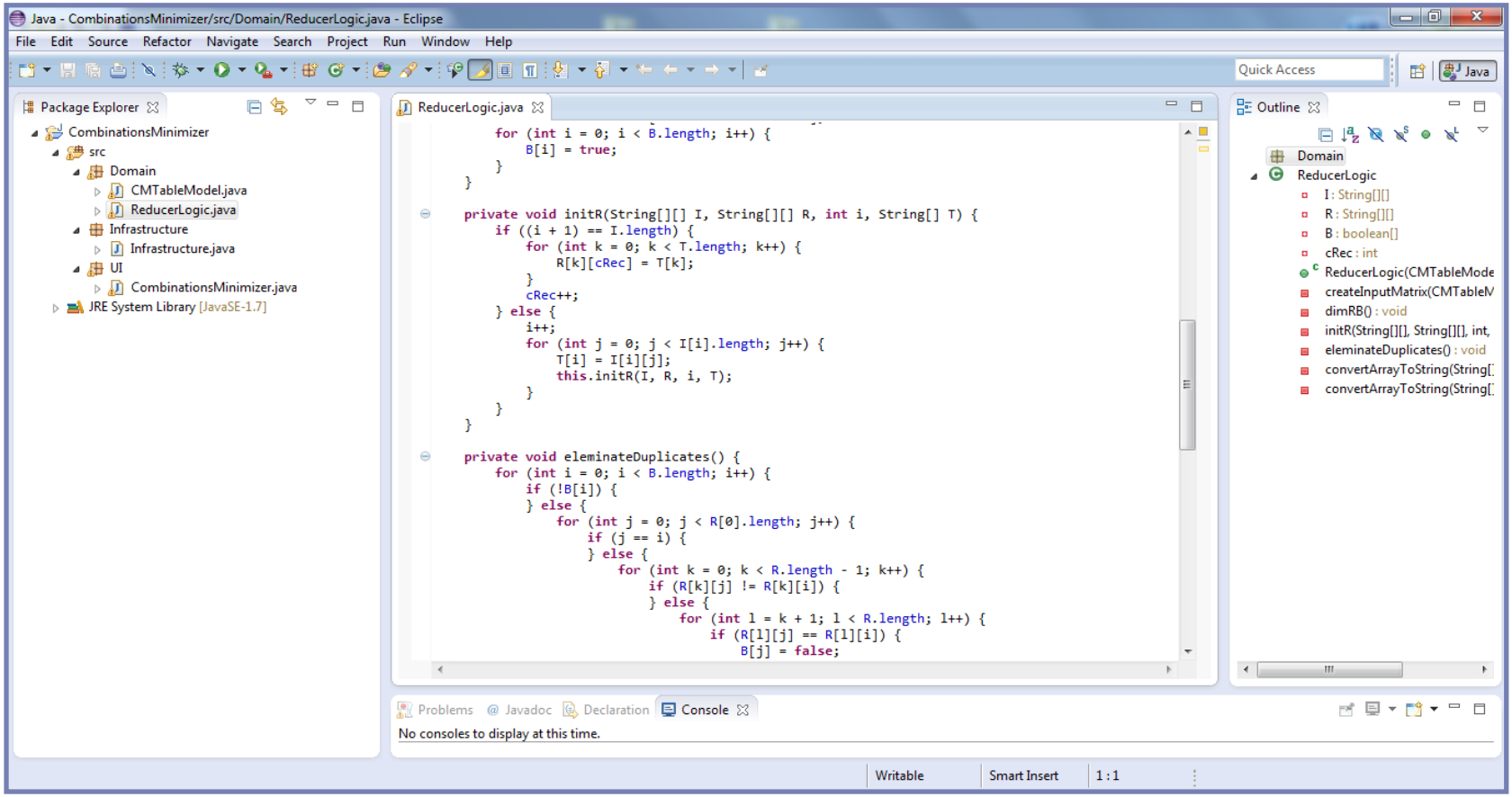
- **Searched**
  A structured way to test the system by not violating the constraints

- **Contraints**
  Limited in time and budget
  Automated testing not possible (e.g. UI not fully implemented)
  Only compiled code of system available

SOLUTION IN VBA/EXCEL

Microsoft Excel
ro-Enabled Worksl

SOLUTION IN JAVA



REQUIREMENTS

ID	Type	Name	Description
1	CRQ	The system shall be able to run platform-independent	java program
2	CRQ	The system shall have a high usability	UI components (AWT)
3	CRQ	The system shall be documented	arc42 template
4	PRQ	The system shall be able to handle an unlimited number of variables and parameters	recursive methods
5	PRQ	The system shall be able to display all combinations in a structured order	
6	PRQ	The system shall be able to display all combinations in a randomized order	
7	PRQ	The system shall be able to handle empty parameters	
8	PRQ	The system shall be able to handle Equivalence Classes and Boundary Value Analysis	
9	PRQ	The system shall be able to export the generated Test Sets into Excel	
10	PRQ	The system shall be flexibel and easily maintainable	Polymorphism, interfaces and abstract classes, Presentation-, Domain- and Infrastucture Layer
11	PRQ	The system shall be able to mark a field as obligatory (respected) and not obligatory (not respected)	
12	SRQ	The system shall highlight these combinations in a randomized order that are allocated to a test set	
13	SRQ	The system shall mark a test case with one or more empty and obligatory parameters as "Negative Test Case"	
14	SRQ	The system shall mark these test cases as "Negative Test Case" that have negative (not supported) combinations	

CURRENT IMPLEMENTATION STATE (ALPHA 1)

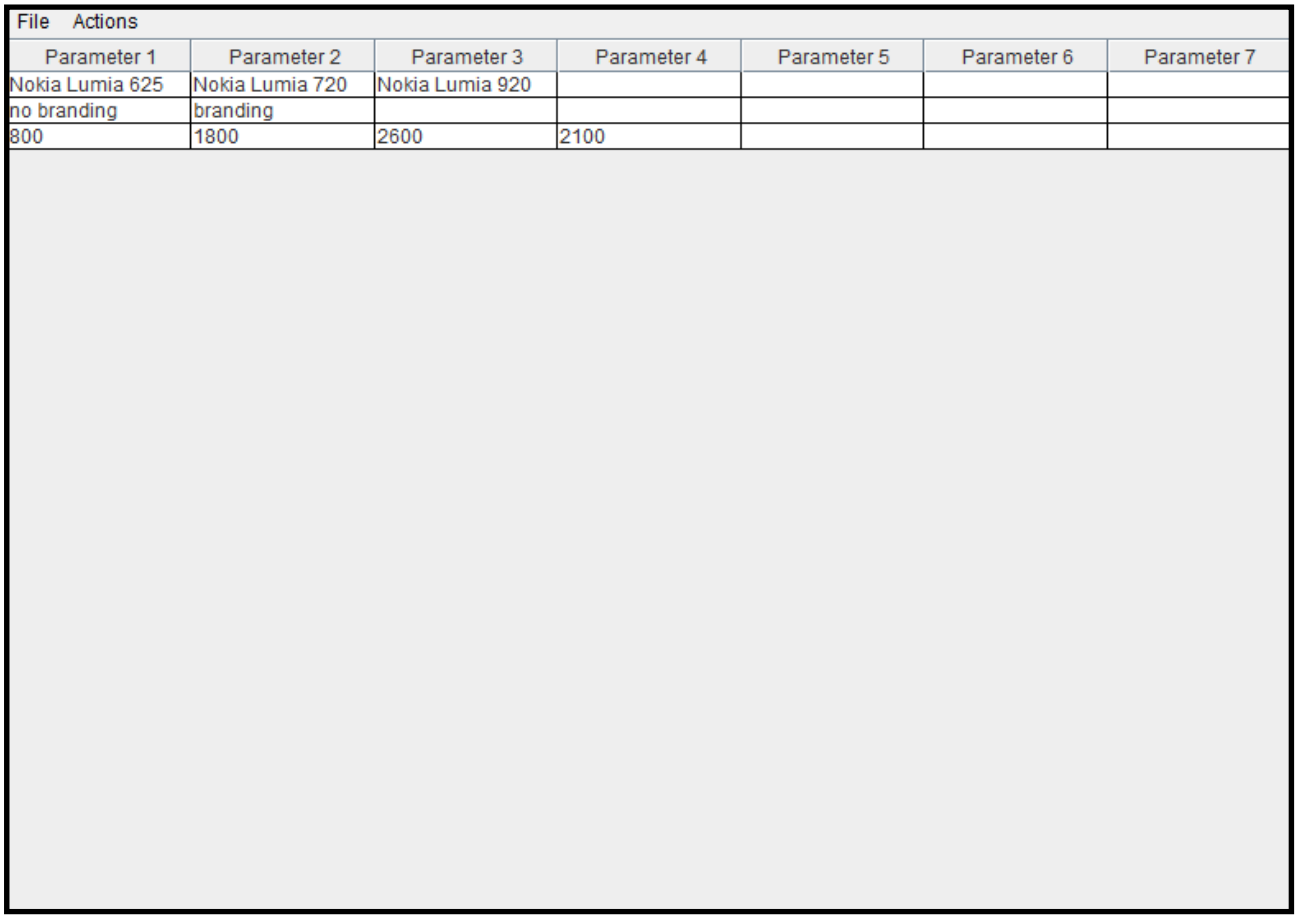
ID	Type	Name	Description	Release Status	Target Cycle	Tech. Implementation State	Tech. Implementation
1	CRQ	The system shall be able to run platform-independent	java program	a1	a1	partially impl.	generateRrandom (R,R2) not implemented
2	CRQ	The system shall have a high usability	UI components (AWT)	a1	a1	fully impl.	
3	CRQ	The system shall be documented	arc42 template		b1		
4	PRQ	The system shall be able to handle an unlimited number of variables and parameters	recursive methods	a1	a1	partially impl.	only variables
5	PRQ	The system shall be able to display all combinations in a structured order		a1	a1	fully impl.	
6	PRQ	The system shall be able to display all combinations in a randomized order			a1		
7	PRQ	The system shall be able to handle empty parameters		a1	a2	fully impl.	
8	PRQ	The system shall be able to handle Equivalence Classes and Boundary Value Analysis		a1	a2	fully impl.	
9	PRQ	The system shall be able to export the generated Test Sets into Excel		a1	a3	partially impl.	csv file
10	PRQ	The system shall be flexibel and easily maintainable	Polymorphism, interfaces and abstract classes, Presentation-, Domain- and Infrastucture Layer	a1	a1	fully impl.	
11	PRQ	The system shall be able to mark a field as obligatory (respected) and not obligatory (not respected)			a2		
12	SRQ	The system shall highlight these combinations in a randomized order that are allocated to a test set			a1		
13	SRQ	The system shall mark a test case with one or more empty and obligatory parameters as "Negative Test Case"			a2		
14	SRQ	The system shall mark these test cases as "Negative Test Case" that have negative (not supported) combinations			a2		

QUESTION

Q: How did the programmer die in the shower?

A: He read the shampoo bottle instructions: Lather. Rinse. Repeat.

DEMO OF COMBINATIONSMINIMIZER ALPHA 1


File Actions

Parameter 1	Parameter 2	Parameter 3	Parameter 4	Parameter 5	Parameter 6	Parameter 7
Nokia Lumia 625	Nokia Lumia 720	Nokia Lumia 920				
no branding	branding					
800	1800	2600	2100			

OUTLOOK – ALPHA 2

ID	Type	Name	Description	Release Status	Target Cycle	Tech. Implementation State	Tech. Implementation
1	CRQ	The system shall be able to run platform-independent	java program	a1	a1	partially impl.	generateRrandom (R,R2) not implemented
2	CRQ	The system shall have a high usability	UI components (AWT)	a1	a1	fully impl.	
3	CRQ	The system shall be documented	arc42 template		b1		
4	PRQ	The system shall be able to handle an unlimited number of variables and parameters	recursive methods	a1	a1	partially impl.	only variables
5	PRQ	The system shall be able to display all combinations in a structured order		a1	a1	fully impl.	
6	PRQ	The system shall be able to display all combinations in a randomized order			a1		
7	PRQ	The system shall be able to handle empty parameters		a1	a2	fully impl.	
8	PRQ	The system shall be able to handle Equivalence Classes and Boundary Value Analysis		a1	a2	fully impl.	
9	PRQ	The system shall be able to export the generated Test Sets into Excel		a1	a3	partially impl.	csv file
10	PRQ	The system shall be flexibel and easily maintainable	Polymorphism, interfaces and abstract classes, Presentation-, Domain- and Infrastucture Layer	a1	a1	fully impl.	
11	PRQ	The system shall be able to mark a field as obligatory (respected) and not obligatory (not respected)			a2		
12	SRQ	The system shall highlight these combinations in a randomized order that are allocated to a test set			a1		
13	SRQ	The system shall mark a test case with one or more empty and obligatory parameters as "Negative Test Case"			a2		
14	SRQ	The system shall mark these test cases as "Negative Test Case" that have negative (not supported) combinations			a2		

OUTLOOK - TESTING

ID	Type	Name	Description	Needed Testing Time (hours)	Testing Level
1	CRQ	The system shall be able to run platform-independent	java program	4	UTC
2	CRQ	The system shall have a high usability	UI components (AWT)		
3	CRQ	The system shall be documented	arc42 template		
4	PRQ	The system shall be able to handle an unlimited number of variables and parameters	recursive methods	0.5	STC
5	PRQ	The system shall be able to display all combinations in a structured order		0.25	STC
6	PRQ	The system shall be able to display all combinations in a randomized order		0.25	STC
7	PRQ	The system shall be able to handle empty parameters		1	UTC and STC
8	PRQ	The system shall be able to handle Equivalence Classes and Boundary Value Analysis		2	UTC and STC
9	PRQ	The system shall be able to export the generated Test Sets into Excel		0.5	STC
10	PRQ	The system shall be flexibel and easily maintainable	Polymorphism, interfaces and abstract classes, Presentation-, Domain- and Infrastucture Layer		
11	PRQ	The system shall be able to mark a field as obligatory (respected) and not obligatory (not respected)		0.5	STC
12	SRQ	The system shall highlight these combinations in a randomized order that are allocated to a test set		0.5	UTC and STC
13	SRQ	The system shall mark a test case with one or more empty and obligatory parameters as "Negative Test Case"		0.5	UTC and STC
14	SRQ	The system shall mark these test cases as "Negative Test Case" that have negative (not supported) combinations		1	UTC and STC
				Total 11	

REFERENCES

http://en.wikipedia.org/wiki/All-pairs_testing

http://www.combinatorialtesting.com/

THANKS FOR YOUR ATTENTION