Summary

Sink States:$0(0 \times 10^0)$

Table 1: Pulse Analysis Summary

Classes	Methods	States	Unsatisfiable Clauses	Unreachable States	Possible concurrent Methods	Total. no. of pairs	No. of concurrent pairs	Percentage of concurrent Methods
SampleAction	5	1	0	0	4	15	7	47
JMLAnnotatedJavaClass	7	1	0	0	6	28	11	39
PluralParser	41	1	0	0	41	861	83	10
EJmlSpecification	14	1	0	0	1	105	1	1
EGhost	6	1	0	0	3	21	6	29
Time	2	1	0	0	0	3	0	0
FileReader	2	1	0	0	1	3	1	33
UserSelectedClassesAnalysis	14	1	0	0	12	105	42	40
EVMDDSMCGenerator	16	1	0	0	15	136	15	11
EPackage	8	1	0	0	3	36	6	17
EClass	26	1	0	0	13	351	91	26
EMethod	22	1	0	0	6	253	21	8
ESpecification	8	1	0	0	7	36	10	28
EGeneratedPluralSpecification	3	1	0	0	0	6	0	0
ESMCModel	65	1	0	0	64	2145	74	3
EField	11	1	0	0	3	66	6	9
EDim	5	1	0	0	2	15	3	20
EParameter	9	1	0	0	4	45	10	22
EState	11	1	0	0	5	66	15	23
EInvariant	11	1	0	0	10	66	20	30
EBoolInvariant	3	1	0	0	2	6	3	50
EGrarphWriter	6	1	0	0	1	21	1	5
EOutputLatex	28	1	0	0	0	406	0	0
WorkspaceUtilities	9	1	0	0	8	45	30	67
SMCVisitor	7	1	0	0	6	28	15	54
PulseSettings	11	1	0	0	5	66	15	23
specificationStruct	1	1	0	0	0	1	0	0
Clause	1	1	0	0	0	1	0	0
Signature	1	1	0	0	0	1	0	0
MethodFindVisitor	2	1	0	0	0	3	0	0
Activator	5	1	0	0	1	15	1	7
GAPHandler	8	1	0	0	7	36	25	69
GAPIFileAction	4	1	0	0	3	10	3	30
Anonymous	2	1	0	0	0	3	0	0

Main	5	1	0	0	4	15	7	47
TypestateReturn	1	1	0	0	0	1	0	0
AtApPermissionReturn	1	1	0	0	0	1	0	0
AccesspermissionReturn	1	1	0	0	0	1	0	0
PluralLexer	63	1	0	0	62	2016	1892	94
DFA7	2	1	0	0	1	3	1	33
EAPTypeState	5	1	0	0	0	15	0	0
Total Classes=41	452	41	0	0	300	7056	2415	34

Contents

1 JGFMonteCarloBenchSizeA 3

2 JGFMonteCarloBench 4

3 CallAppDemo 5

4 AppDemo 6

5 Universal 8

6 PathId 9

7 RatePath 10

8 ReturnPath 11

9 MonteCarloPath 13

10 ToInitAllTasks 15

11 ToResult 17

12 PriceStock 18

13 ToTask 19

14 DemoException 20

15 JGFInstrumentor 21

16 JGFTimer 22

17 test 23

18 Utilities 24

19 Abbreviation 25

20 Annotated Version of Sequential Java Program generated by Sip4j 26

1 SampleAction

Table 2: Methods Requires Clause Satisfiability

Method	Satisfiability
SampleAction	√
run	√
selectionChanged	√
dispose	√
init	√

Table 3: State Transition Matrix

	alive
alive	↑

Table 4: Methods Concurrency Matrix

	SampleAction	run	selectionChanged	dispose	init
SampleAction	∦	∦	∦	∦	∦
run	∦	∦	‖	‖	∦
selectionChanged	∦	‖	‖	‖	‖
dispose	∦	‖	‖	‖	‖
init	∦	∦	‖	‖	∦

2 JMLAnnotatedJavaClass

Table 5: Methods Requires Clause Satisfiability

Method	Satisfiability
JMLAnnotatedJavaClass	$\surd$
translateJMLAnnotationsToPlural	$\surd$
translateClassSpecifications	$\surd$
parseAndStoreJMLAnnotation	$\surd$
translateMethodSpecification	$\surd$
getInputStream	$\surd$
readFileAsString	$\surd$

Table 6: State Transition Matrix

	alive
alive	$\uparrow$

Table 7: Methods Concurrency Matrix

	JMLAnnotatedJavaClass	translateJMLAnnotationsToPlural	translateClassSpecifications	parseAndStoreJMLAnnotation	translateMethodSpecification	getInputStream	readFileAsString
JMLAnnotatedJavaClass	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
translateJMLAnnotationsToPlural	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$	$\parallel$
translateClassSpecifications	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$	$\parallel$
parseAndStoreJMLAnnotation	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$	$\parallel$
translateMethodSpecification	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$	$\parallel$
getInputStream	$\nparallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$
readFileAsString	$\nparallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$

3 PluralParser

Table 8: Methods Requires Clause Satisfiability

Method	Satisfiability
PluralParser	√
jmlSpecifications	√
jmlClassSpecifications	√
jmlGhostDeclaration	√
jmlGhostInv	√
jmlMethodSpecification	√
jmlRequires	√
jmlReq	√
jmlOrReq	√
jmlLessThanEqualReq	√
jmlAssign	√
jmlEnsures	√
jmlEns	√
jmlOldEns	√
specifications	√
perm	√
requiresensuresClause	√
requiresClause	√
reaccesspermissionTypestates	√
accesspermission	√
typestate	√
ensuresclause	√
enaccesspermissiontypestates	√
attype	√
atappermission	√
usevalue	√
cases	√
other	√
classstates	√
startClassstates	√
state	√
invariant	√
condition	√
endclassstates	√
refine	√
states	√
dimension	√
value	√
item	√
getTokenNames	√
getGrammarFileName	√

Table 9: State Transition Matrix

	alive
alive	↑

Table 10: Methods Concurrency Mat

	PluralParser	jmlSpecifications	jmlClassSpecifications	jmlGhostDeclaration	jmlGhostInv	jmlMethodSpecification	jmlRequires	jmlReq	jmlOrReq	jmlLessThanEqualReq	jmlAssign	jmlEnsures	jmlEns	jmlOldEns	specifications	perm	requiresensuresClause	requiresClause	reaccesspermissionTypestates	accesspermission	typestate
PluralParser	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlSpecifications	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlClassSpecifications	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlGhostDeclaration	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlGhostInv	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlMethodSpecification	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlRequires	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlReq	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlOrReq	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlLessThanEqualReq	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlAssign	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlEnsures	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlEns	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
jmlOldEns	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
specifications	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
perm	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
requiresensuresClause	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
requiresClause	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
reaccesspermissionTypestates	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
accesspermission	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	
typestate	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
ensuresclause	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
enaccesspermissiontypestates	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
attype	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
atappermission	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	
usevalue	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
cases	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
other	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
classstates	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
startClassstates	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
state	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
invariant	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
condition	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
endclassstates	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
refine	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
states	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
dimension	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
value	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
item	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#

getTokenNames	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||
getGrammarFileName	|\	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||	||

4 EJmlSpecification

Table 11: Methods Requires Clause Satisfiability

Method	Satisfiability
EJmlSpecification	√
setDimensionName	√
setDimensionValues	√
addRequires	√
setPerm	√
setEnsures	√
JmlClassSpec2PluralClassSpec	√
reset	√
JmlMethodSpec2PluralMethodSpec	√
moreRequires	√
getPerm	√
determineEnsures	√
oneRequires	√
noRequires	√

Table 12: State Transition Matrix

	alive
alive	↑

Table 13: Methods Concurrency Matrix

	EJmlSpecification	setDimensionName	setDimensionValues	addRequires	setPerm	setEnsures	JmlClassSpec2PluralClassSpec	reset	JmlMethodSpec2PluralMethodSpec	moreRequires	getPerm	determineEnsures	oneRequires	noRequires
EJmlSpecification	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setDimensionName	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setDimensionValues	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
addRequires	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setPerm	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setEnsures	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
JmlClassSpec2PluralClassSpec	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
reset	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
JmlMethodSpec2PluralMethodSpec	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
moreRequires	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

getPerm	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦	∦	∦
determineEnsures	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
oneRequires	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
noRequires	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

5 EGhost

Table 14: Methods Requires Clause Satisfiability

Method	Satisfiability
EGhost	√
setDimensionName	√
setDimensionValues	√
getDimensionName	√
getLowValueofInv	√
getHighValueofInv	√

Table 15: State Transition Matrix

	alive
alive	↑

Table 16: Methods Concurrency Matrix

	EGhost	setDimensionName	setDimensionValues	getDimensionName	getLowValueofInv	getHighValueofInv
EGhost	∦	∦	∦	∦	∦	∦
setDimensionName	∦	∦	∦	∦	∦	∦
setDimensionValues	∦	∦	∦	∦	∦	∦
getDimensionName	∦	∦	∦	‖	‖	‖
getLowValueofInv	∦	∦	∦	‖	‖	‖
getHighValueofInv	∦	∦	∦	‖	‖	‖

6 Time

Table 17: Methods Requires Clause Satisfiability

Method	Satisfiability
Time	√
toString	√

Table 18: State Transition Matrix

	alive
alive	↑

Table 19: Methods Concurrency Matrix

	Time	toString
Time	∦	∦
toString	∦	∦

7 FileReader

Table 20: Methods Requires Clause Satisfiability

Method	Satisfiability
FileReader	$\surd$
readFile	$\surd$

Table 21: State Transition Matrix

	alive
alive	$\uparrow$

Table 22: Methods Concurrency Matrix

	FileReader	readFile
FileReader	$\nparallel$	$\nparallel$
readFile	$\nparallel$	$\parallel$

8 UserSelectedClassesAnalysis

Table 23: Methods Requires Clause Satisfiability

Method	Satisfiability
UserSelectedClassesAnalysis	√
getCompilationUnit	√
analyzeFromCommandLine	√
callModelCheckerThroughCommandLine	√
printMetrics	√
printMethodMetrics	√
getTime	√
CreatePdfSummary_CommandLine	√
makePdfCommandLine	√
analyzeFromPlugin	√
getInputStream	√
callModelCheckerThroughPlugin	√
createPdfSummaryPlugin	√
makePdfPlugin	√

Table 24: State Transition Matrix

	alive
alive	↑

Table 25: Methods Concurrency Matrix

	UserSelectedClassesAnalysis	getCompilationUnit	analyzeFromCommandLine	callModelCheckerThroughCommandLine	printMetrics	printMethodMetrics	getTime	CreatePdfSummary_CommandLine	makePdfCommandLine	analyzeFromPlugin	getInputStream	callModelCheckerThroughPlugin	createPdfSummaryPlugin	makePdfPlugin
UserSelectedClassesAnalysis	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getCompilationUnit	∦	‖	‖	‖	‖	‖	‖	∦	‖	‖	‖	‖	‖	‖
analyzeFromCommandLine	∦	‖	∦	∦	∦	∦	∦	∦	‖	∦	‖	∦	∦	‖
callModelCheckerThroughCommandLine	∦	‖	∦	∦	∦	∦	∦	∦	‖	∦	‖	∦	∦	‖
printMetrics	∦	‖	∦	∦	∦	∦	∦	∦	‖	∦	‖	∦	∦	‖
printMethodMetrics	∦	‖	∦	∦	∦	∦	∦	∦	‖	∦	‖	∦	∦	‖
getTime	∦	‖	∦	∦	∦	∦	∦	∦	‖	∦	‖	∦	∦	‖
CreatePdfSummary_CommandLine	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

makePdfCommandLine	∦	∥	∥	∥	∥	∥	∥	∦	∥	∥	∥	∥	∥	∥
analyzeFromPlugin	∦	∥	∦	∦	∦	∦	∦	∦	∥	∦	∥	∦	∦	∥
getInputStream	∦	∥	∥	∥	∥	∥	∥	∦	∥	∥	∥	∥	∥	∥
callModelCheckerThroughPlugin	∦	∥	∦	∦	∦	∦	∦	∦	∥	∦	∥	∦	∦	∥
createPdfSummaryPlugin	∦	∥	∦	∦	∦	∦	∦	∦	∥	∦	∥	∦	∦	∥
makePdfPlugin	∦	∥	∥	∥	∥	∥	∥	∦	∥	∥	∥	∥	∥	∥

9 EVMDDSMCGenerator

Table 26: Methods Requires Clause Satisfiability

Method	Satisfiability
EVMDDSMCGenerator	√
reset	√
modifyConstructorSpecifications	√
getPkgObject	√
addRequiresAPTS	√
addRequiresParamAPTS	√
addEnsuresAPTS	√
addEnsuresResultAPTS	√
addEnsuresParamAPTS	√
addCase	√
addState	√
addBoolStateInvariant	√
addStateInvariant	√
addDimension	√
addDimensionValue	√
addPkgObject	√

Table 27: State Transition Matrix

	alive
alive	↑

Table 28: Methods Concurrency Matrix

	EVMDDSMCGenerator	reset	modifyConstructorSpecifications	getPkgObject	addRequiresAPTS	addRequiresParamAPTS	addEnsuresAPTS	addEnsuresResultAPTS	addEnsuresParamAPTS	addCase	addState	addBoolStateInvariant	addStateInvariant	addDimension	addDimensionValue	addPkgObject
EVMDDSMCGenerator	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
reset	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
modifyConstructorSpecifications	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
getPkgObject	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addRequiresAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addRequiresParamAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addEnsuresAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addEnsuresResultAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addEnsuresParamAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖

addCase	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addState	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addBoolStateInvariant	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addStateInvariant	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addDimension	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addDimensionValue	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖
addPkgObject	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖

10 EPackage

Table 29: Methods Requires Clause Satisfiability

Method	Satisfiability
EPackage	$\surd$
getClasses	$\surd$
getTotalStates	$\surd$
getTotalReachableStates	$\surd$
getSinkStates	$\surd$
setSinkStates	$\surd$
setName	$\surd$
getName	$\surd$

Table 30: State Transition Matrix

	alive
alive	$\uparrow$

Table 31: Methods Concurrency Matrix

	EPackage	getClasses	getTotalStates	getTotalReachableStates	getSinkStates	setSinkStates	setName	getName
EPackage	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
getClasses	$\nparallel$	$\parallel$	$\nparallel$	$\parallel$	$\parallel$	$\nparallel$	$\nparallel$	$\nparallel$
getTotalStates	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
getTotalReachableStates	$\nparallel$	$\parallel$	$\nparallel$	$\parallel$	$\parallel$	$\nparallel$	$\nparallel$	$\nparallel$
getSinkStates	$\nparallel$	$\parallel$	$\nparallel$	$\parallel$	$\parallel$	$\nparallel$	$\nparallel$	$\nparallel$
setSinkStates	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
setName	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
getName	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$

11 EClass

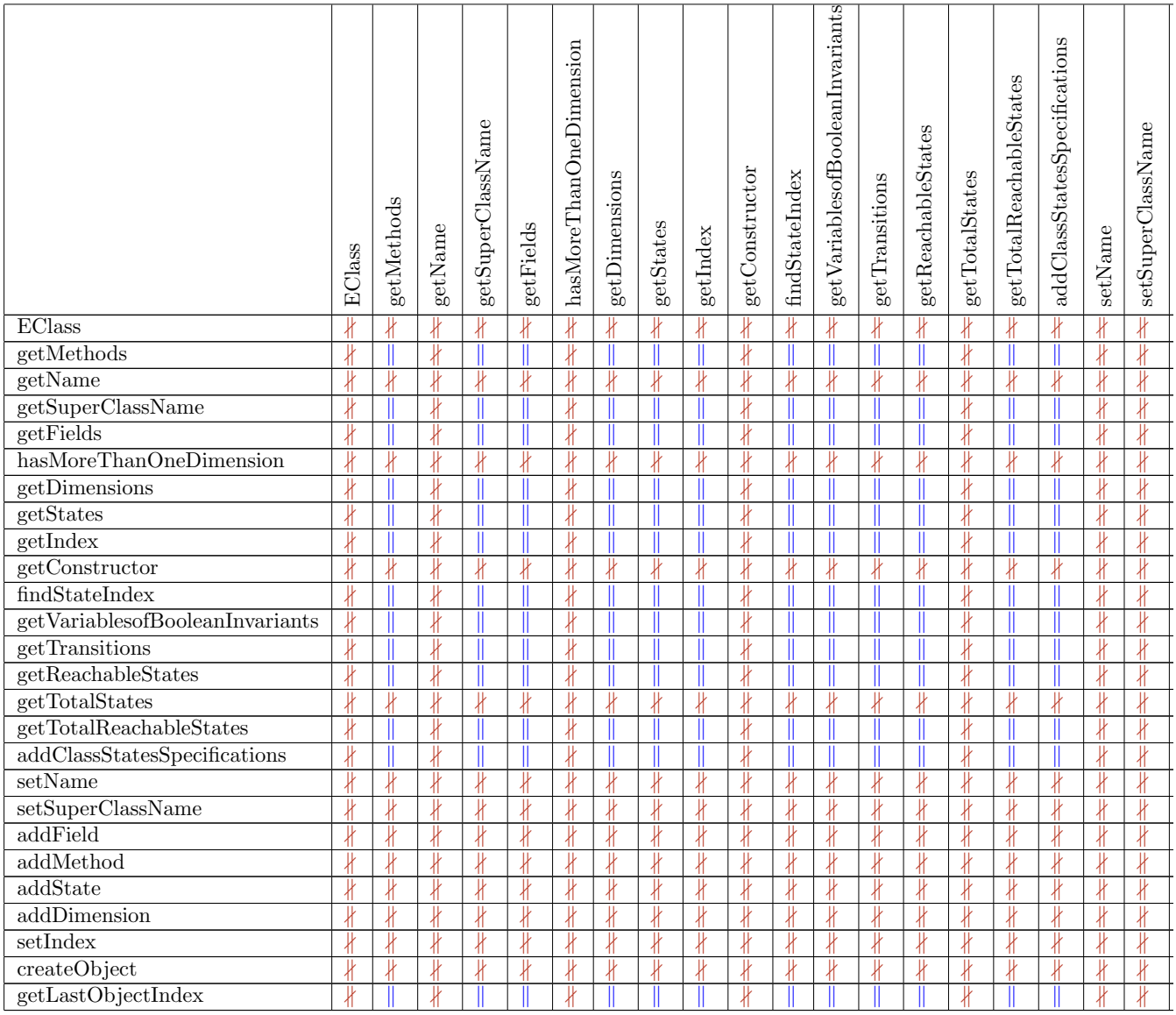
Table 32: Methods Requires Clause Satisfiability

Method	Satisfiability
EClass	√
getMethods	√
getName	√
getSuperClassName	√
getFields	√
hasMoreThanOneDimension	√
getDimensions	√
getStates	√
getIndex	√
getConstructor	√
findStateIndex	√
getVariablesofBooleanInvariants	√
getTransitions	√
getReachableStates	√
getTotalStates	√
getTotalReachableStates	√
addClassStatesSpecifications	√
setName	√
setSuperClassName	√
addField	√
addMethod	√
addState	√
addDimension	√
setIndex	√
createObject	√
getLastObjectIndex	√

Table 33: State Transition Matrix

	alive
alive	↑

Table 34: Methods Concurrency Matrix


EClass
getMethods
getName
getSuperClassName
getFields
hasMoreThanOneDimension
getDimensions
getStates
getIndex
getConstructor
findStateIndex
getVariablesofBooleanInvariants
getTransitions
getReachableStates
getTotalStates
getTotalReachableStates
addClassStatesSpecifications
setName
setSuperClassName
EClass
getMethods
getName
getSuperClassName
getFields
hasMoreThanOneDimension
getDimensions
getStates
getIndex
getConstructor
findStateIndex
getVariablesofBooleanInvariants
getTransitions
getReachableStates
getTotalStates
getTotalReachableStates
addClassStatesSpecifications
setName
setSuperClassName
addField
addMethod
addState
addDimension
setIndex
createObject
getLastObjectIndex

12 EMethod

Table 35: Methods Requires Clause Satisfiability

Method	Satisfiability
EMethod	√
getName	√
getRequiresAPTS	√
getEnsuresAPTS	√
getIdentifier	√
getParameters	√
getIndex	√
getRequiresClauseSatisfiability	√
isConcurrentMethod	√
setRequiresClauseSatisfiability	√
setConcurrentMethod	√
addSpecifications	√
setName	√
setReturnType	√
setIdentifier	√
addParameter	√
getReturnType	√
setCaseNumber	√
getCaseNumber	√
setIndex	√
setJMLPermission	√
getJMLPermission	√

Table 36: State Transition Matrix

	alive
alive	↑

Table 37: Methods Concurrency Matrix

	EMethod	getName	getRequiresAPTS	getEnsuresAPTS	getIdentifier	getParameters	getIndex	getRequiresClauseSatisfiability	isConcurrentMethod	setRequiresClauseSatisfiability	setConcurrentMethod	addSpecifications	setName	setReturnType	setIdentifier	addParameter	getReturnType	setCaseNumber	getCaseNumber	setIndex
EMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getName	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getRequiresAPTS	∦	∦	‖	‖	∦	‖	‖	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
getEnsuresAPTS	∦	∦	‖	‖	∦	‖	‖	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦

getIdentifier	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getParameters	∦	∦	‖	‖	∦	‖	‖	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
getIndex	∦	∦	‖	‖	∦	‖	‖	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
getRequiresClauseSatisfiability	∦	∦	‖	‖	∦	‖	‖	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
isConcurrentMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setRequiresClauseSatisfiability	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setConcurrentMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
addSpecifications	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setName	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setReturnType	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setIdentifier	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
addParameter	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getReturnType	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setCaseNumber	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getCaseNumber	∦	∦	‖	‖	∦	‖	‖	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
setIndex	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setJMLPermission	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getJMLPermission	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

13 ESpecification

Table 38: Methods Requires Clause Satisfiability

Method	Satisfiability
ESpecification	$\surd$
setAP	$\surd$
getParentClass	$\surd$
getFieldName	$\surd$
getTS	$\surd$
getAP	$\surd$
setAPTS	$\surd$
clone	$\surd$

Table 39: State Transition Matrix

	alive
alive	$\uparrow$

Table 40: Methods Concurrency Matrix

	ESpecification	setAP	getParentClass	getFieldName	getTS	getAP	setAPTS	clone
ESpecification	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
setAP	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$
getParentClass	$\nparallel$	$\nparallel$	$\parallel$	$\parallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$
getFieldName	$\nparallel$	$\nparallel$	$\parallel$	$\parallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$
getTS	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$
getAP	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$
setAPTS	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\parallel$
clone	$\nparallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$	$\parallel$

14 EGeneratedPluralSpecification

Table 41: Methods Requires Clause Satisfiability

Method	Satisfiability
EGeneratedPluralSpecification	√
createFromCommandLine	√
createFromPlugin	√

Table 42: State Transition Matrix

	alive
alive	↑

Table 43: Methods Concurrency Matrix

	EGeneratedPluralSpecification	createFromCommandLine	createFromPlugin
EGeneratedPluralSpecification	∦	∦	∦
createFromCommandLine	∦	∦	∦
createFromPlugin	∦	∦	∦

15 ESMCModel

Table 44: Methods Requires Clause Satisfiability

Method	Satisfiability
ESMCModel	√
setK	√
generateSMCmodelCommandLine	√
Transitions	√
comment	√
declarationsAndinitilizations	√
initialize	√
modelAlias	√
isClassExist	√
createInstanceInModel	√
modelPrimePCandMethod	√
startMethod	√
modelPCConstructor	√
modelAPs	√
getClass	√
getObjectIndex	√
modelPCMethod	√
getFieldClass	√
getDimensionIndex	√
startAPTS	√
startAPTSPARAM	√
error	√
startPrimeTSPARAM	√
starPrimeAP	√
modelPrimeConstructor	√
modelInheritance	√
modelPrimeAPStateInvariants	√
getClassIndex	√
modelPrimeAP	√
getAPId	√
modelEndPCMethod	√
endMethod	√
modelEndPCConstructor	√
modelPrimePCConstructor	√
modelPrimePC	√
endPrimeAPTS	√
modelendConstructor	√
updateBoolStateInvariants	√
updateStateInvariants	√
updateState	√
modelState	√
modelStateInvariants	√
modelBoolStateInvariants	√
methodsReachability	√
modelAP	√
updateTokens	√
endPrimeAPTSPARAM	√

initilizeVariables	√
initilizeKVariables	√
defineVariables	√
defineKVariables	√
isPrivateAndIndexEqualToZero	√
generateSMCmodelPlugin	√
createAlias	√
addIndexes	√
createDimensionsObject	√
createDimensionAsField	√
createParentObject	√
createParentAsField	√
addInvariantStateIndex	√
setInvariantVariableType	√
Spec	√
statesAdjancyMatrix	√
concurrentMethods	√
sinkStates	√

Table 45: State Transition Matrix

	alive
alive	↑

	ESMCModel	setK	generateSMCmodelCommandLine	Transitions	comment	declarationsAndinitilizations	initialize	modelAlias	isClassExist	createInstanceInModel	modelPrimePCandMethod	startMethod	modelPCConstructor	modelAPs	getClass	getObjectIndex	modelPCMethod	getFieldClass	getDimensionIndex	startAPTS
ESMCModel	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setK	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
generateSMCmodelCommandLine	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
Transitions	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
comment	∦	∦	∦	∦	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
declarationsAndinitilizations	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
initialize	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelAlias	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
isClassExist	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
createInstanceInModel	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPrimePCandMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

startMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPCConstructor	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelAPs	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getClass	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getObjectIndex	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPCMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getFieldClass	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getDimensionIndex	∦	∦	∦	∦	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
startAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
startAPTSPARAM	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
error	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
startPrimeTSPARAM	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
starPrimeAP	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPrimeConstructor	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelInheritance	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPrimeAPStateInvariants	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getClassIndex	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPrimeAP	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getAPId	∦	∦	∦	∦	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
modelEndPCMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
endMethod	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelEndPCConstructor	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPrimePCConstructor	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelPrimePC	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
endPrimeAPTS	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelendConstructor	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
updateBoolStateInvariants	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
updateStateInvariants	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
updateState	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelState	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelStateInvariants	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelBoolStateInvariants	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
methodsReachability	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
modelAP	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
updateTokens	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
endPrimeAPTSPARAM	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
initilizeVariables	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
initilizeKVariables	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
defineVariables	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
defineKVariables	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
isPrivateAndIndexEqualToZero	∦	∦	∦	∦	‖	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	‖	∦
generateSMCmodelPlugin	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
createAlias	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
addIndexes	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
createDimensionsObject	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
createDimensionAsField	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
createParentObject	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
createParentAsField	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
addInvariantStateIndex	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setInvariantVariableType	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
Spec	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

statesAdjancyMatrix	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
concurrentMethods	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
sinkStates	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫

16 EField

Table 47: Methods Requires Clause Satisfiability

Method	Satisfiability
EField	√
getName	√
getObjectIndex	√
getType	√
getClassIndex	√
getModifier	√
setName	√
setType	√
setModifier	√
setClassIndex	√
setObjectIndex	√

Table 48: State Transition Matrix

	alive
alive	↑

Table 49: Methods Concurrency Matrix

	EField	getName	getObjectIndex	getType	getClassIndex	getModifier	setName	setType	setModifier	setClassIndex	setObjectIndex
EField	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getName	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getObjectIndex	∦	∦	‖	∦	‖	‖	∦	∦	∦	∦	∦
getType	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getClassIndex	∦	∦	‖	∦	‖	‖	∦	∦	∦	∦	∦
getModifier	∦	∦	‖	∦	‖	‖	∦	∦	∦	∦	∦
setName	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setType	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setModifier	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setClassIndex	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setObjectIndex	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦

17 EDim

Table 50: Methods Requires Clause Satisfiability

Method	Satisfiability
EDim	$\surd$
getValues	$\surd$
addValue	$\surd$
setName	$\surd$
getName	$\surd$

Table 51: State Transition Matrix

	alive
alive	$\uparrow$

Table 52: Methods Concurrency Matrix

	EDim	getValues	addValue	setName	getName
EDim	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
getValues	$\nparallel$	$\parallel$	$\nparallel$	$\nparallel$	$\parallel$
addValue	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
setName	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$	$\nparallel$
getName	$\nparallel$	$\parallel$	$\nparallel$	$\nparallel$	$\parallel$

18 EParameter

Table 53: Methods Requires Clause Satisfiability

Method	Satisfiability
EParameter	√
getRequiresAPTS	√
getType	√
getEnsuresAPTS	√
getName	√
getNumber	√
setNumber	√
setName	√
setType	√

Table 54: State Transition Matrix

	alive
alive	↑

Table 55: Methods Concurrency Matrix

	EParameter	getRequiresAPTS	getType	getEnsuresAPTS	getName	getNumber	setNumber	setName	setType
EParameter	∦	∦	∦	∦	∦	∦	∦	∦	∦
getRequiresAPTS	∦	‖	‖	‖	∦	‖	∦	∦	∦
getType	∦	‖	‖	‖	∦	‖	∦	∦	∦
getEnsuresAPTS	∦	‖	‖	‖	∦	‖	∦	∦	∦
getName	∦	∦	∦	∦	∦	∦	∦	∦	∦
getNumber	∦	‖	‖	‖	∦	‖	∦	∦	∦
setNumber	∦	∦	∦	∦	∦	∦	∦	∦	∦
setName	∦	∦	∦	∦	∦	∦	∦	∦	∦
setType	∦	∦	∦	∦	∦	∦	∦	∦	∦

19 EState

Table 56: Methods Requires Clause Satisfiability

Method	Satisfiability
EState	√
getName	√
getInvariants	√
getBoolInvariants	√
getStateIndex	√
isReachable	√
setReachability	√
isReachableState	√
addBoolInvariant	√
addInvariant	√
setIndex	√

Table 57: State Transition Matrix

	alive
alive	↑

Table 58: Methods Concurrency Matrix

	EState	getName	getInvariants	getBoolInvariants	getStateIndex	isReachable	setReachability	isReachableState	addBoolInvariant	addInvariant	setIndex
EState	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
getName	⫫	‖	‖	‖	‖	‖	⫫	⫫	⫫	⫫	⫫
getInvariants	⫫	‖	‖	‖	‖	‖	⫫	⫫	⫫	⫫	⫫
getBoolInvariants	⫫	‖	‖	‖	‖	‖	⫫	⫫	⫫	⫫	⫫
getStateIndex	⫫	‖	‖	‖	‖	‖	⫫	⫫	⫫	⫫	⫫
isReachable	⫫	‖	‖	‖	‖	‖	⫫	⫫	⫫	⫫	⫫
setReachability	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
isReachableState	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
addBoolInvariant	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
addInvariant	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫
setIndex	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫	⫫

20 EInvariant

Table 59: Methods Requires Clause Satisfiability

Method	Satisfiability
EInvariant	√
getAP	√
getVariableType	√
getVariable	√
getStateName	√
getStateInvariants	√
setVariableType	√
setStateIndex	√
setAP	√
setVariable	√
setState	√

Table 60: State Transition Matrix

	alive
alive	↑

Table 61: Methods Concurrency Matrix

	EInvariant	getAP	getVariableType	getVariable	getStateName	getStateInvariants	setVariableType	setStateIndex	setAP	setVariable	setState
EInvariant	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getAP	∦	‖	‖	‖	‖	∦	∦	‖	∦	∦	∦
getVariableType	∦	‖	‖	‖	‖	∦	∦	‖	∦	∦	∦
getVariable	∦	‖	‖	‖	‖	∦	∦	‖	∦	∦	∦
getStateName	∦	‖	‖	‖	‖	∦	∦	‖	∦	∦	∦
getStateInvariants	∦	∦	∦	∦	∦	∦	∦	‖	∦	∦	∦
setVariableType	∦	∦	∦	∦	∦	∦	∦	‖	∦	∦	∦
setStateIndex	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
setAP	∦	∦	∦	∦	∦	∦	∦	‖	∦	∦	∦
setVariable	∦	∦	∦	∦	∦	∦	∦	‖	∦	∦	∦
setState	∦	∦	∦	∦	∦	∦	∦	‖	∦	∦	∦

21 EBoolInvariant

Table 62: Methods Requires Clause Satisfiability

Method	Satisfiability
EBoolInvariant	√
getVariable	√
getValue	√

Table 63: State Transition Matrix

	alive
alive	↑

Table 64: Methods Concurrency Matrix

	EBoolInvariant	getVariable	getValue
EBoolInvariant	∦	∦	∦
getVariable	∦	‖	‖
getValue	∦	‖	‖

22 EGrarphWriter

Table 65: Methods Requires Clause Satisfiability

Method	Satisfiability
EGrarphWriter	√
addTrnsitions	√
parseMethodReachability	√
createGraph	√
getNumberofUnReachableMethods	√
setNumberofUnReachableMethods	√

Table 66: State Transition Matrix

	alive
alive	↑

Table 67: Methods Concurrency Matrix

	EGrarphWriter	addTrnsitions	parseMethodReachability	createGraph	getNumberofUnReachableMethods	setNumberofUnReachableMethods
EGrarphWriter	∦	∦	∦	∦	∦	∦
addTrnsitions	∦	∦	∦	∦	∦	∦
parseMethodReachability	∦	∦	∦	∦	∦	∦
createGraph	∦	∦	∦	∦	∦	∦
getNumberofUnReachableMethods	∦	∦	∦	∦	‖	∦
setNumberofUnReachableMethods	∦	∦	∦	∦	∦	∦

23 EOutputLatex

Table 68: Methods Requires Clause Satisfiability

Method	Satisfiability
EOutputLatex	√
create_CommandLine	√
addUsePackages	√
writeToLatex	√
WriteSummary	√
addSummaryTableColumns	√
addSummaryTableHeaders	√
addSummaryTableRows	√
writeRequiresClauseSatisfiabilty	√
writeStateTransitionMatrix	√
addSTMNumberofColumns	√
addSTMColumnsHeaders	√
addSTMRows	√
getStateReachabilityValue	√
writeMethodConcurrencyMatrix	√
addConcurrencyMatrixColumns	√
addConcurrencyMatrixHeaders	√
addConcurrencyMatrixRows	√
getConcurrencyValue	√
writeAbbervations	√
reset	√
setText	√
parseRequires	√
getMethod	√
parseTransitions	√
parseConcurrentMethods	√
parseSinkStates	√
create_Plugin	√

Table 69: State Transition Matrix

	alive
alive	↑

Table 70: Methods Concurrency Matrix

	EOutputLatex	create_CommandLine	addUsePackages	writeToLatex	WriteSummary	addSummaryTableColumns	addSummaryTableHeaders	addSummaryTableRows	writeRequiresClauseSatisfiabilty	writeStateTransitionMatrix	addSTMNumberofColumns	addSTMColumnsHeaders	addSTMRows	getStateReachabilityValue	writeMethodConcurrencyMatrix	addConcurrencyMatrixColumns	addConcurrencyMatrixHeaders	addConcurrencyMatrixRows	getConcurrencyValue
EOutputLatex	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
create_CommandLine	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addUsePackages	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
writeToLatex	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
WriteSummary	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addSummaryTableColumns	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addSummaryTableHeaders	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addSummaryTableRows	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
writeRequiresClauseSatisfiabilty	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
writeStateTransitionMatrix	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addSTMNumberofColumns	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addSTMColumnsHeaders	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addSTMRows	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
getStateReachabilityValue	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
writeMethodConcurrencyMatrix	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addConcurrencyMatrixColumns	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addConcurrencyMatrixHeaders	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
addConcurrencyMatrixRows	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
getConcurrencyValue	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
writeAbbervations	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
reset	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
setText	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
parseRequires	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
getMethod	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
parseTransitions	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
parseConcurrentMethods	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
parseSinkStates	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
create_Plugin	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠

24 WorkspaceUtilities

Table 71: Methods Requires Clause Satisfiability

Method	Satisfiability
WorkspaceUtilities	√
getASTNodeFromCompilationUnit	√
scanForCompilationUnits	√
collectCompilationUnits	√
findCompilationUnits	√
getWorkspaceRelativeName	√
parseCompilationUnits	√
scanForMethodDeclarations	√
scanForMethodDeclarationsFromAST	√

Table 72: State Transition Matrix

	alive
alive	↑

Table 73: Methods Concurrency Matrix

	WorkspaceUtilities	getASTNodeFromCompilationUnit	scanForCompilationUnits	collectCompilationUnits	findCompilationUnits	getWorkspaceRelativeName	parseCompilationUnits	scanForMethodDeclarations	scanForMethodDeclarationsFromAST
WorkspaceUtilities	∦	∦	∦	∦	∦	∦	∦	∦	∦
getASTNodeFromCompilationUnit	∦	‖	‖	‖	‖	‖	‖	‖	‖
scanForCompilationUnits	∦	‖	∦	∦	∦	‖	‖	‖	‖
collectCompilationUnits	∦	‖	∦	∦	∦	‖	‖	‖	‖
findCompilationUnits	∦	‖	∦	∦	∦	‖	‖	‖	‖
getWorkspaceRelativeName	∦	‖	‖	‖	‖	‖	‖	‖	‖
parseCompilationUnits	∦	‖	‖	‖	‖	‖	‖	‖	‖
scanForMethodDeclarations	∦	‖	‖	‖	‖	‖	‖	‖	‖
scanForMethodDeclarationsFromAST	∦	‖	‖	‖	‖	‖	‖	‖	‖

25 SMCVisitor

Table 74: Methods Requires Clause Satisfiability

Method	Satisfiability
SMCVisitor	√
addUnparsedSpecifications	√
preVisit	√
postVisit	√
visit	√
endVisit	√
callParser	√

Table 75: State Transition Matrix

	alive
alive	↑

Table 76: Methods Concurrency Matrix

	SMCVisitor	addUnparsedSpecifications	preVisit	postVisit	visit	endVisit	callParser
SMCVisitor	∦	∦	∦	∦	∦	∦	∦
addUnparsedSpecifications	∦	∦	‖	‖	∦	‖	∦
preVisit	∦	‖	‖	‖	‖	‖	‖
postVisit	∦	‖	‖	‖	‖	‖	‖
visit	∦	∦	‖	‖	∦	‖	∦
endVisit	∦	‖	‖	‖	‖	‖	‖
callParser	∦	∦	‖	‖	∦	‖	∦

26 PulseSettings

Table 77: Methods Requires Clause Satisfiability

Method	Satisfiability
PulseSettings	√
getInheritance	√
getFullModel	√
getInvariants	√
getDimensions	√
setInvariants	√
setAliasPerObject	√
setFullModel	√
setDimensions	√
setInheritance	√
getAliasPerObject	√

Table 78: State Transition Matrix

	alive
alive	↑

Table 79: Methods Concurrency Matrix

	PulseSettings	getInheritance	getFullModel	getInvariants	getDimensions	setInvariants	setAliasPerObject	setFullModel	setDimensions	setInheritance	getAliasPerObject
PulseSettings	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getInheritance	∦	‖	‖	‖	‖	∦	∦	∦	∦	∦	‖
getFullModel	∦	‖	‖	‖	‖	∦	∦	∦	∦	∦	‖
getInvariants	∦	‖	‖	‖	‖	∦	∦	∦	∦	∦	‖
getDimensions	∦	‖	‖	‖	‖	∦	∦	∦	∦	∦	‖
setInvariants	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setAliasPerObject	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setFullModel	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setDimensions	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
setInheritance	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getAliasPerObject	∦	‖	‖	‖	‖	∦	∦	∦	∦	∦	‖

27 specificationStruct

Table 80: Methods Requires Clause Satisfiability

Method	Satisfiability
specificationStruct	√

Table 81: State Transition Matrix

	alive
alive	↑

28 Clause

Table 82: Methods Requires Clause Satisfiability

Method	Satisfiability
Clause	√

Table 83: State Transition Matrix

	alive
alive	↑

29 Signature

Table 84: Methods Requires Clause Satisfiability

Method	Satisfiability
Signature	√

Table 85: State Transition Matrix

	alive
alive	↑

30 MethodFindVisitor

Table 86: Methods Requires Clause Satisfiability

Method	Satisfiability
MethodFindVisitor	√
visit	√

Table 87: State Transition Matrix

	alive
alive	↑

Table 88: Methods Concurrency Matrix

	MethodFindVisitor	visit
MethodFindVisitor	∦	∦
visit	∦	∦

31 Activator

Table 89: Methods Requires Clause Satisfiability

Method	Satisfiability
Activator	√
start	√
stop	√
getDefault	√
getImageDescriptor	√

Table 90: State Transition Matrix

	alive
alive	↑

Table 91: Methods Concurrency Matrix

	Activator	start	stop	getDefault	getImageDescriptor
Activator	∦	∦	∦	∦	∦
start	∦	∦	∦	∦	∦
stop	∦	∦	∦	∦	∦
getDefault	∦	∦	∦	‖	∦
getImageDescriptor	∦	∦	∦	∦	∦

32 GAPHandler

Table 92: Methods Requires Clause Satisfiability

Method	Satisfiability
GAPHandler	√
addHandlerListener	√
dispose	√
execute	√
extractSettings	√
isEnabled	√
isHandled	√
removeHandlerListener	√

Table 93: State Transition Matrix

	alive
alive	↑

Table 94: Methods Concurrency Matrix

	GAPHandler	addHandlerListener	dispose	execute	extractSettings	isEnabled	isHandled	removeHandlerListener
GAPHandler	∦	∦	∦	∦	∦	∦	∦	∦
addHandlerListener	∦	‖	‖	‖	‖	‖	‖	‖
dispose	∦	‖	‖	‖	‖	‖	‖	‖
execute	∦	‖	‖	∦	∦	‖	‖	‖
extractSettings	∦	‖	‖	∦	∦	‖	‖	‖
isEnabled	∦	‖	‖	‖	‖	‖	‖	‖
isHandled	∦	‖	‖	‖	‖	‖	‖	‖
removeHandlerListener	∦	‖	‖	‖	‖	‖	‖	‖

33 GAPIFileAction

Table 95: Methods Requires Clause Satisfiability

Method	Satisfiability
GAPIFileAction	√
selectionChanged	√
setActivePart	√
run	√

Table 96: State Transition Matrix

	alive
alive	↑

Table 97: Methods Concurrency Matrix

	GAPIFileAction	selectionChanged	setActivePart	run
GAPIFileAction	∦	∦	∦	∦
selectionChanged	∦	∦	∥	∦
setActivePart	∦	∥	∥	∥
run	∦	∦	∥	∦

34 Anonymous

Table 98: Methods Requires Clause Satisfiability

Method	Satisfiability
Anonymous	√
run	√

Table 99: State Transition Matrix

	alive
alive	↑

Table 100: Methods Concurrency Matrix

	Anonymous	run
Anonymous	∦	∦
run	∦	∦

35 Main

Table 101: Methods Requires Clause Satisfiability

Method	Satisfiability
Main	√
main	√
testRead	√
seprateJavaFile	√
anTest	√

Table 102: State Transition Matrix

	alive
alive	↑

Table 103: Methods Concurrency Matrix

	Main	main	testRead	seprateJavaFile	anTest
Main	∦	∦	∦	∦	∦
main	∦	∦	‖	∦	‖
testRead	∦	‖	‖	‖	‖
seprateJavaFile	∦	∦	‖	∦	‖
anTest	∦	‖	‖	‖	‖

36 TypestateReturn

Table 104: Methods Requires Clause Satisfiability

Method	Satisfiability
TypestateReturn	√

Table 105: State Transition Matrix

	alive
alive	↑

37 AtApPermissionReturn

Table 106: Methods Requires Clause Satisfiability

Method	Satisfiability
AtApPermissionReturn	√

Table 107: State Transition Matrix

	alive
alive	↑

38 AccesspermissionReturn

Table 108: Methods Requires Clause Satisfiability

Method	Satisfiability
AccesspermissionReturn	√

Table 109: State Transition Matrix

	alive
alive	↑

39 PluralLexer

Table 110: Methods Requires Clause Satisfiability

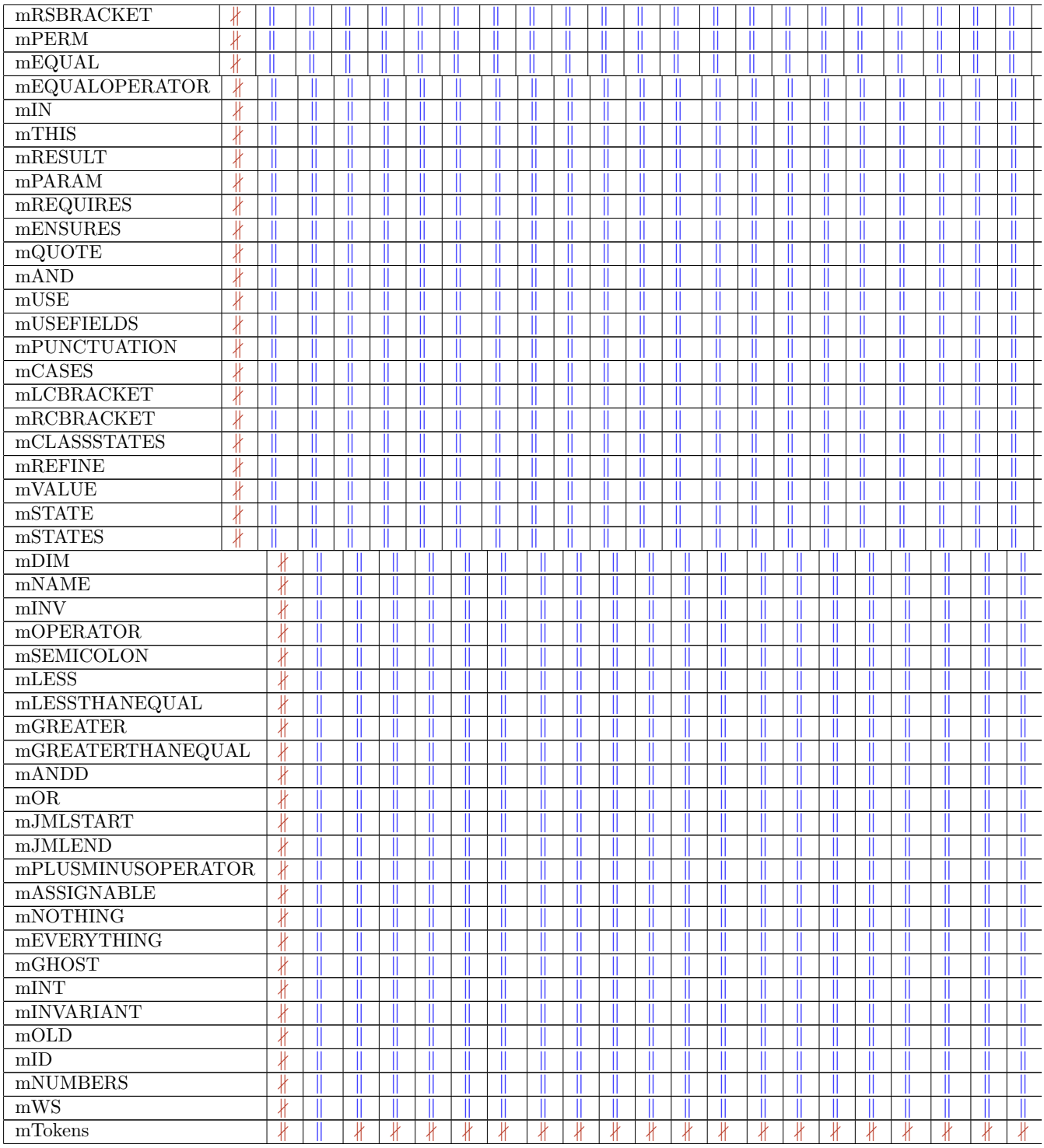
Method	Satisfiability
PluralLexer	√
getGrammarFileName	√
mATFULL	√
mATPURE	√
mATIMMUTABLE	√
mATSHARE	√
mATUNIQUE	√
mPUBLICBEHAVIOR	√
mFULL	√
mPURE	√
mIMMUTABLE	√
mSHARE	√
mUNIQUE	√
mNONE	√
mLSBRACKET	√
mRSBRACKET	√
mPERM	√
mEQUAL	√
mEQUALOPERATOR	√
mIN	√
mTHIS	√
mRESULT	√
mPARAM	√
mREQUIRES	√
mENSURES	√
mQUOTE	√
mAND	√
mUSE	√
mUSEFIELDS	√
mPUNCTUATION	√
mCASES	√
mLCBRACKET	√
mRCBRACKET	√
mCLASSSTATES	√
mREFINE	√
mVALUE	√
mSTATE	√
mSTATES	√
mDIM	√
mNAME	√
mINV	√
mOPERATOR	√
mSEMICOLON	√
mLESS	√
mLESSTHANEQUAL	√
mGREATER	√
mGREATERTHANEQUAL	√

mANDD	√
mOR	√
mJMLSTART	√
mJMLEND	√
mPLUSMINUSOPERATOR	√
mASSIGNABLE	√
mNOTHING	√
mEVERYTHING	√
mGHOST	√
mINT	√
mINVARIANT	√
mOLD	√
mID	√
mNUMBERS	√
mWS	√
mTokens	√

Table 111: State Transition Matrix

	alive
alive	↑

	PluralLexer	getGrammarFileName	mATFULL	mATPURE	mATIMMUTABLE	mATSHARE	mATUNIQUE	mPUBLICBEHAVIOR	mFULL	mPURE	mIMMUTABLE	mSHARE	mUNIQUE	mNONE	mLSBRACKET	mRSBRACKET	mPERM	mEQUAL	mEQUALOPERATOR	mIN	mTHIS	mRESULT
PluralLexer	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦	∦
getGrammarFileName	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mATFULL	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mATPURE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mATIMMUTABLE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mATSHARE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mATUNIQUE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mPUBLICBEHAVIOR	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mFULL	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mPURE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mIMMUTABLE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mSHARE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mUNIQUE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mNONE	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖
mLSBRACKET	∦	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖	‖


mRSBRACKET
mPERM
mEQUAL
mEQUALOPERATOR
mIN
mTHIS
mRESULT
mPARAM
mREQUIRES
mENSURES
mQUOTE
mAND
mUSE
mUSEFIELDS
mPUNCTUATION
mCASES
mLCBRACKET
mRCBRACKET
mCLASSSTATES
mREFINE
mVALUE
mSTATE
mSTATES
mDIM
mNAME
mINV
mOPERATOR
mSEMICOLON
mLESS
mLESSTHANEQUAL
mGREATER
mGREATERTHANEQUAL
mANDD
mOR
mJMLSTART
mJMLEND
mPLUSMINUSOPERATOR
mASSIGNABLE
mNOTHING
mEVERYTHING
mGHOST
mINT
mINVARIANT
mOLD
mID
mNUMBERS
mWS
mTokens

40 DFA7

Table 113: Methods Requires Clause Satisfiability

Method	Satisfiability
DFA7	√
getDescription	√

Table 114: State Transition Matrix

	alive
alive	↑

Table 115: Methods Concurrency Matrix

	DFA7	getDescription
DFA7	∦	∦
getDescription	∦	‖

41 EAPTypeState

Table 116: Methods Requires Clause Satisfiability

Method	Satisfiability
EAPTypeState	√
setAP	√
getAP	√
setTS	√
getTS	√

Table 117: State Transition Matrix

	alive
alive	↑

Table 118: Methods Concurrency Matrix

	EAPTypeState	setAP	getAP	setTS	getTS
EAPTypeState	∦	∦	∦	∦	∦
setAP	∦	∦	∦	∦	∦
getAP	∦	∦	∦	∦	∦
setTS	∦	∦	∦	∦	∦
getTS	∦	∦	∦	∦	∦

42 Abbreviation

Table 119: Used Abbreviation

Symbol	Meaning
$\surd$	requires clause of the method is satisfiable
$\times$	requires clause of the method is unsatisfiable
$\uparrow$	The row-state can be transitioned to the column-state
$\times$	The row-state cannot be transitioned to the column-state
$\parallel$	The row-method can be possibly executed parallel with the column-method
$\nparallel$	The row-method cannot be executed parallel with the column-method

43 Annotated Version of Sequential Java Program generated by Sip4j

```
1  package outputs;
2  import edu.cmu.cs.plural.annot.*;

4  @ClassStates({@State(name = "alive")})
5  class SampleAction {
6  @Perm(ensures="unique(this) in alive")
7  SampleAction() {   }

9  @Perm(requires="share(this) in alive",
10 ensures="share(this) in alive")
11  public void run(IAction action) {

13 }

15  public void selectionChanged(IAction action, ISelection selection) {

17 }

19  public void dispose() {

21 }
22 @Perm(requires="share(this) in alive",
23 ensures="share(this) in alive")
24  public void init(IWorkbenchWindow window) {

26 }

28 }ENDOFCLASS

30 @ClassStates({@State(name = "alive")})

32 class JMLAnnotatedJavaClass {
33 @Perm(ensures="unique(this) in alive")
34 JMLAnnotatedJavaClass() {   }

36 @Perm(requires="unique(this) in alive",
37 ensures="unique(this) in alive")
38  public String translateJMLAnnotationsToPlural(String JProgram) {
39  return null;

41 }
42 @Perm(requires="unique(this) in alive",
43 ensures="unique(this) in alive")
44  private String translateClassSpecifications(String JProgram) {
45  return null;

47 }
48 @Perm(requires="unique(this) in alive",
49 ensures="unique(this) in alive")
50  private void parseAndStoreJMLAnnotation(String JMLAnnotation) {

52 }
53 @Perm(requires="unique(this) in alive",
54 ensures="unique(this) in alive")
55  private String translateMethodSpecification(String JProgram) {
56  return null;

58 }

60  public String getInputStream(ICompilationUnit unit) {
61  return null;

63 }

65  public String readFileAsString(String filePath) {
66  return null;

68 }

70 }ENDOFCLASS

72 @ClassStates({@State(name = "alive")})

74 class PluralParser {
75 @Perm(ensures="unique(this) in alive")
```

```
76  PluralParser() {   }

78  @Perm(requires="unique(this) in alive",
79  ensures="unique(this) in alive")
80    void jmlSpecifications() {

82  }
83  @Perm(requires="unique(this) in alive",
84  ensures="unique(this) in alive")
85    void jmlClassSpecifications() {

87  }
88  @Perm(requires="unique(this) in alive",
89  ensures="unique(this) in alive")
90    void jmlGhostDeclaration() {

92  }
93  @Perm(requires="unique(this) in alive",
94  ensures="unique(this) in alive")
95    void jmlGhostInv() {

97  }
98  @Perm(requires="unique(this) in alive",
99  ensures="unique(this) in alive")
100   void jmlMethodSpecification() {

102 }
103 @Perm(requires="unique(this) in alive",
104 ensures="unique(this) in alive")
105   void jmlRequires() {

107 }
108 @Perm(requires="unique(this) in alive",
109 ensures="unique(this) in alive")
110   void jmlReq() {

112 }
113 @Perm(requires="unique(this) in alive",
114 ensures="unique(this) in alive")
115   void jmlOrReq() {

117 }
118 @Perm(requires="unique(this) in alive",
119 ensures="unique(this) in alive")
120   void jmlLessThanEqualReq() {

122 }
123 @Perm(requires="unique(this) in alive",
124 ensures="unique(this) in alive")
125   void jmlAssign() {

127 }
128 @Perm(requires="unique(this) in alive",
129 ensures="unique(this) in alive")
130   void jmlEnsures() {

132 }
133 @Perm(requires="unique(this) in alive",
134 ensures="unique(this) in alive")
135   void jmlEns() {

137 }
138 @Perm(requires="unique(this) in alive",
139 ensures="unique(this) in alive")
140   void jmlOldEns() {

142 }
143 @Perm(requires="unique(this) in alive",
144 ensures="unique(this) in alive")
145   void specifications() {

147 }
148 @Perm(requires="unique(this) in alive",
149 ensures="unique(this) in alive")
150   void perm() {

152 }
153 @Perm(requires="unique(this) in alive",
154 ensures="unique(this) in alive")
155   void requiresensuresClause() {
```

```
157  }
158  @Perm(requires="unique(this) in alive",
159  ensures="unique(this) in alive")
160    void requiresClause() {

162  }
163  @Perm(requires="unique(this) in alive",
164  ensures="unique(this) in alive")
165    void reaccesspermissionTypestates() {

167  }
168  @Perm(requires="immutable(this) in alive",
169  ensures="immutable(this) in alive")
170    AccesspermissionReturn accesspermission() {
171   return null;

173  }
174  @Perm(requires="unique(this) in alive",
175  ensures="unique(this) in alive")
176    TypestateReturn typestate() {
177   return null;

179  }
180  @Perm(requires="unique(this) in alive",
181  ensures="unique(this) in alive")
182    void ensuresclause() {

184  }
185  @Perm(requires="unique(this) in alive",
186  ensures="unique(this) in alive")
187    void enaccesspermissiontypestates() {

189  }
190  @Perm(requires="unique(this) in alive",
191  ensures="unique(this) in alive")
192    void attype() {

194  }
195  @Perm(requires="immutable(this) in alive",
196  ensures="immutable(this) in alive")
197    AtApPermissionReturn atappermission() {
198   return null;

200  }
201  @Perm(requires="unique(this) in alive",
202  ensures="unique(this) in alive")
203    void usevalue() {

205  }
206  @Perm(requires="unique(this) in alive",
207  ensures="unique(this) in alive")
208    void cases() {

210  }
211  @Perm(requires="unique(this) in alive",
212  ensures="unique(this) in alive")
213    void other() {

215  }
216  @Perm(requires="unique(this) in alive",
217  ensures="unique(this) in alive")
218    void classstates() {

220  }
221  @Perm(requires="unique(this) in alive",
222  ensures="unique(this) in alive")
223    void startClassstates() {

225  }
226  @Perm(requires="unique(this) in alive",
227  ensures="unique(this) in alive")
228    void state() {

230  }
231  @Perm(requires="unique(this) in alive",
232  ensures="unique(this) in alive")
233    void invariant() {

235  }
236  @Perm(requires="unique(this) in alive",
237  ensures="unique(this) in alive")
```

```
238   void condition() {

240 }
241 @Perm(requires="unique(this) in alive",
242 ensures="unique(this) in alive")
243   void endclassstates() {

245 }
246 @Perm(requires="unique(this) in alive",
247 ensures="unique(this) in alive")
248   void refine() {

250 }
251 @Perm(requires="unique(this) in alive",
252 ensures="unique(this) in alive")
253   void states() {

255 }
256 @Perm(requires="unique(this) in alive",
257 ensures="unique(this) in alive")
258   void dimension() {

260 }
261 @Perm(requires="unique(this) in alive",
262 ensures="unique(this) in alive")
263   void value() {

265 }
266 @Perm(requires="unique(this) in alive",
267 ensures="unique(this) in alive")
268   void item() {

270 }
271 @Perm(ensures="none(this) in alive")
272  public String[] getTokenNames() {
273  return null;

275 }

277  public String getGrammarFileName() {
278  return null;

280 }

282 }ENDOFCLASS

284 @ClassStates({@State(name = "alive")})

286 class EJmlSpecification {
287 @Perm(ensures="unique(this) in alive")
288 EJmlSpecification() {   }

290 @Perm(requires="share(this) in alive",
291 ensures="share(this) in alive")
292   void setDimensionName(String str) {

294 }
295 @Perm(requires="share(this) in alive",
296 ensures="share(this) in alive")
297   void setDimensionValues(int low, int high) {

299 }
300 @Perm(requires="share(this) in alive",
301 ensures="share(this) in alive")
302   void addRequires(String str) {

304 }
305 @Perm(requires="share(this) in alive",
306 ensures="share(this) in alive")
307   void setPerm(String str) {

309 }
310 @Perm(requires="share(this) in alive",
311 ensures="share(this) in alive")
312   void setEnsures(String str) {

314 }
315 @Perm(requires="share(this) in alive",
316 ensures="share(this) in alive")
317   String JmlClassSpec2PluralClassSpec() {
318  return null;
```

```
}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void reset() {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  String JmlMethodSpec2PluralMethodSpec() {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  String moreRequires() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
  String getPerm() {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  String determineEnsures(String req) {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  String oneRequires() {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  String noRequires() {
 return null;

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EGhost {
@Perm(ensures="unique(this) in alive")
EGhost() {   }

@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setDimensionName(String str) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setDimensionValues(int low, int high) {

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getDimensionName() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public int getLowValueofInv() {
 return 0;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public int getHighValueofInv() {
 return 0;

}
```

```
}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class Time {
@Perm(ensures="unique(this) in alive")
Time() {   }

@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public String toString() {
 return null;

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class FileReader {
@Perm(ensures="unique(this) in alive")
FileReader() {   }


  String readFile(String pathname) {
 return null;

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class UserSelectedClassesAnalysis {
@Perm(ensures="unique(this) in alive")
UserSelectedClassesAnalysis() {   }


 private CompilationUnit getCompilationUnit(String prog) {
 return null;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void analyzeFromCommandLine(LinkedList<String> inputFiles, String strType, String strK) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void callModelCheckerThroughCommandLine() {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void printMetrics() {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void printMethodMetrics() {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  Time getTime() {
 return null;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void CreatePdfSummary_CommandLine() {

}

  void makePdfCommandLine() {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
 public void analyzeFromPlugin(List<ICompilationUnit> compilationUnitList, int test) {
```

```
}

 public String getInputStream(ICompilationUnit unit) {
 return null;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void callModelCheckerThroughPlugin() {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void createPdfSummaryPlugin() {

}

  void makePdfPlugin() {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EVMDDSMCGenerator {
@Perm(ensures="unique(this) in alive")
EVMDDSMCGenerator() {   }

@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void reset() {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  String modifyConstructorSpecifications(String prog) {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  EPackage getPkgObject() {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addRequiresAPTS(String ap, String ts) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addRequiresParamAPTS(String ap, String ts, String argumentNumber) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addEnsuresAPTS(String ap, String ts) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void addEnsuresResultAPTS(String ap, String ts) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addEnsuresParamAPTS(String ap, String ts, String argumentNumber) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void addCase() {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addState(String stateName) {

}
```

```
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addBoolStateInvariant(String variable, String operator, String value) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addStateInvariant(String accessPermission, String variable, String state) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addDimension(String name) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void addDimensionValue(String value) {

}

  void addPkgObject(EPackage _pkg) {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EPackage {
@Perm(ensures="unique(this) in alive")
EPackage() {   }

@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public LinkedList<EClass> getClasses() {
 return null;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
 public int getTotalStates() {
 return 0;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public int getTotalReachableStates() {
 return 0;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getSinkStates() {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setSinkStates(String sinkStates) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setName(String str) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
 public String getName() {
 return null;

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EClass {
@Perm(ensures="unique(this) in alive")
EClass() {   }
```

```
644 @Perm(requires="pure(this) in alive",
645 ensures="pure(this) in alive")
646  public LinkedList<EMethod> getMethods() {
647  return null;

649 }
650 @Perm(requires="unique(this) in alive",
651 ensures="unique(this) in alive")
652  public String getName() {
653  return null;

655 }
656 @Perm(requires="pure(this) in alive",
657 ensures="pure(this) in alive")
658  public String getSuperClassName() {
659  return null;

661 }
662 @Perm(requires="pure(this) in alive",
663 ensures="pure(this) in alive")
664  public LinkedList<EField> getFields() {
665  return null;

667 }
668 @Perm(requires="share(this) in alive",
669 ensures="share(this) in alive")
670  public boolean hasMoreThanOneDimension() {
671  return 0;

673 }
674 @Perm(requires="pure(this) in alive",
675 ensures="pure(this) in alive")
676  public LinkedList<EDim> getDimensions() {
677  return null;

679 }
680 @Perm(requires="pure(this) in alive",
681 ensures="pure(this) in alive")
682  public LinkedList<EState> getStates() {
683  return null;

685 }
686 @Perm(requires="pure(this) in alive",
687 ensures="pure(this) in alive")
688  public int getIndex() {
689  return 0;

691 }
692 @Perm(requires="share(this) in alive",
693 ensures="share(this) in alive")
694  public EMethod getConstructor() {
695  return null;

697 }
698 @Perm(requires="pure(this) in alive",
699 ensures="pure(this) in alive")
700  public int findStateIndex(String st) {
701  return 0;

703 }
704 @Perm(requires="immutable(this) in alive",
705 ensures="immutable(this) in alive")
706  public ArrayList<String> getVariablesofBooleanInvariants() {
707  return null;

709 }
710 @Perm(requires="immutable(this) in alive",
711 ensures="immutable(this) in alive")
712  public LinkedList<String> getTransitions() {
713  return null;

715 }
716 @Perm(requires="pure(this) in alive",
717 ensures="pure(this) in alive")
718  public LinkedList<EState> getReachableStates() {
719  return null;

721 }
722 @Perm(requires="unique(this) in alive",
723 ensures="unique(this) in alive")
```

```
724  public int getTotalStates() {
725  return 0;

727 }
728 @Perm(requires="pure(this) in alive",
729 ensures="pure(this) in alive")
730  public int getTotalReachableStates() {
731  return 0;

733 }
734 @Perm(requires="immutable(this) in alive",
735 ensures="immutable(this) in alive")
736  public void addClassStatesSpecifications(String annotation) {

738 }
739 @Perm(requires="share(this) in alive",
740 ensures="share(this) in alive")
741  public void setName(String str) {

743 }
744 @Perm(requires="share(this) in alive",
745 ensures="share(this) in alive")
746  public void setSuperClassName(String str) {

748 }
749 @Perm(requires="share(this) in alive",
750 ensures="share(this) in alive")
751  public void addField(EField field) {

753 }
754 @Perm(requires="share(this) in alive",
755 ensures="share(this) in alive")
756  public void addMethod(EMethod method) {

758 }
759 @Perm(requires="share(this) in alive",
760 ensures="share(this) in alive")
761  public void addState(EState state) {

763 }
764 @Perm(requires="share(this) in alive",
765 ensures="share(this) in alive")
766  public void addDimension(EDim dim) {

768 }
769 @Perm(requires="share(this) in alive",
770 ensures="share(this) in alive")
771  public void setIndex(int classIndex) {

773 }
774 @Perm(requires="share(this) in alive",
775 ensures="share(this) in alive")
776  public void createObject() {

778 }
779 @Perm(requires="pure(this) in alive",
780 ensures="pure(this) in alive")
781  public int getLastObjectIndex() {
782  return 0;

784 }

786 }ENDOFCLASS

788 @ClassStates({@State(name = "alive")})

790 class EMethod {
791 @Perm(ensures="unique(this) in alive")
792 EMethod() {   }

794 @Perm(requires="unique(this) in alive",
795 ensures="unique(this) in alive")
796  public String getName() {
797  return null;

799 }
800 @Perm(requires="immutable(this) in alive",
801 ensures="immutable(this) in alive")
802  public LinkedList<ESpecification> getRequiresAPTS() {
803  return null;
```

```
805  }
806  @Perm(requires="immutable(this) in alive",
807  ensures="immutable(this) in alive")
808   public LinkedList<ESpecification> getEnsuresAPTS() {
809   return null;

811  }
812  @Perm(requires="unique(this) in alive",
813  ensures="unique(this) in alive")
814   public String getIdentifier() {
815   return null;

817  }
818  @Perm(requires="pure(this) in alive",
819  ensures="pure(this) in alive")
820   public LinkedList<EParameter> getParameters() {
821   return null;

823  }
824  @Perm(requires="pure(this) in alive",
825  ensures="pure(this) in alive")
826   public int getIndex() {
827   return 0;

829  }
830  @Perm(requires="pure(this) in alive",
831  ensures="pure(this) in alive")
832   public boolean getRequiresClauseSatisfiability() {
833   return 0;

835  }
836  @Perm(requires="share(this) in alive",
837  ensures="share(this) in alive")
838   public Boolean isConcurrentMethod() {
839   return null;

841  }
842  @Perm(requires="share(this) in alive",
843  ensures="share(this) in alive")
844   public void setRequiresClauseSatisfiability(Boolean flag) {

846  }
847  @Perm(requires="share(this) in alive",
848  ensures="share(this) in alive")
849   public void setConcurrentMethod(String toMethod) {

851  }
852  @Perm(requires="share(this) in alive",
853  ensures="share(this) in alive")
854   public void addSpecifications(String annotation) {

856  }
857  @Perm(requires="share(this) in alive",
858  ensures="share(this) in alive")
859   public void setName(String str) {

861  }
862  @Perm(requires="share(this) in alive",
863  ensures="share(this) in alive")
864   public void setReturnType(String str) {

866  }
867  @Perm(requires="share(this) in alive",
868  ensures="share(this) in alive")
869   public void setIdentifier(String str) {

871  }
872  @Perm(requires="share(this) in alive",
873  ensures="share(this) in alive")
874   public void addParameter(EParameter parameter) {

876  }
877  @Perm(requires="unique(this) in alive",
878  ensures="unique(this) in alive")
879   public String getReturnType() {
880   return null;

882  }
883  @Perm(requires="share(this) in alive",
884  ensures="share(this) in alive")
885   public void setCaseNumber(int x) {
```

```
887 }
888 @Perm(requires="pure(this) in alive",
889 ensures="pure(this) in alive")
890  public int getCaseNumber() {
891  return 0;

893 }
894 @Perm(requires="share(this) in alive",
895 ensures="share(this) in alive")
896  public void setIndex(int methodIndex) {

898 }
899 @Perm(requires="share(this) in alive",
900 ensures="share(this) in alive")
901  public void setJMLPermission(String Permission) {

903 }
904 @Perm(requires="unique(this) in alive",
905 ensures="unique(this) in alive")
906  public String getJMLPermission() {
907  return null;

909 }

911 }ENDOFCLASS

913 @ClassStates({@State(name = "alive")})

915 class ESpecification {
916 @Perm(ensures="unique(this) in alive")
917 ESpecification() {   }

919 @Perm(requires="share(this) in alive",
920 ensures="share(this) in alive")
921  public void setAP(String ap) {

923 }
924 @Perm(requires="pure(this) in alive",
925 ensures="pure(this) in alive")
926  public EClass getParentClass() {
927  return null;

929 }
930 @Perm(requires="pure(this) in alive",
931 ensures="pure(this) in alive")
932  public String getFieldName() {
933  return null;

935 }
936 @Perm(requires="unique(this) in alive",
937 ensures="unique(this) in alive")
938  public String getTS() {
939  return null;

941 }
942 @Perm(requires="unique(this) in alive",
943 ensures="unique(this) in alive")
944  public String getAP() {
945  return null;

947 }
948 @Perm(requires="share(this) in alive",
949 ensures="share(this) in alive")
950  public void setAPTS(String ap, String ts) {

952 }

954  public Object clone() {
955  return null;

957 }

959 }ENDOFCLASS

961 @ClassStates({@State(name = "alive")})

963 class EGeneratedPluralSpecification {
964 @Perm(ensures="unique(this) in alive")
965 EGeneratedPluralSpecification() {   }
```

```
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void createFromCommandLine(String prog, String className) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void createFromPlugin(String prog, String className) {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class ESMCModel {
@Perm(ensures="unique(this) in alive")
ESMCModel() {   }

@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void setK(int k) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void generateSMCmodelCommandLine(int testType) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void Transitions() {

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
  String comment(String str) {
 return null;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void declarationsAndinitilizations() {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void initialize(LinkedList<EClass> _listClasses) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void modelAlias(String className, Integer objectIndex, Integer refIndex) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  boolean isClassExist(String className) {
 return 0;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void createInstanceInModel(EClass _class, String name, int objectIndex, int J) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void modelPrimePCandMethod(EClass _class, EMethod _method, Integer objectIndex, Integer refIndex) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void startMethod(EClass _class, EMethod _method, Integer objectIndex, Integer refIndex) {

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void modelPCConstructor(EClass _class, Integer objectIndex, Integer refIndex, EClass _currentClass) {

}
```

```
1048 @Perm(requires="unique(this) in alive",
1049 ensures="unique(this) in alive")
1050   void modelAPs(EClass _class, Integer objectIndex, Integer refIndex) {

1052 }
1053 @Perm(requires="unique(this) in alive",
1054 ensures="unique(this) in alive")
1055   EClass getClass(String className) {
1056  return null;

1058 }
1059 @Perm(requires="unique(this) in alive",
1060 ensures="unique(this) in alive")
1061   int getObjectIndex(EClass _class, String variable) {
1062  return 0;

1064 }
1065 @Perm(requires="unique(this) in alive",
1066 ensures="unique(this) in alive")
1067   void modelPCMethod(EClass _class, Integer objectIndex, Integer refIndex) {

1069 }
1070 @Perm(requires="unique(this) in alive",
1071 ensures="unique(this) in alive")
1072   EClass getFieldClass(EClass _class, String fieldName) {
1073  return null;

1075 }
1076 @Perm(requires="pure(this) in alive",
1077 ensures="pure(this) in alive")
1078   int getDimensionIndex(EClass _class, String ts) {
1079  return 0;

1081 }
1082 @Perm(requires="unique(this) in alive",
1083 ensures="unique(this) in alive")
1084   void startAPTS(EClass _class, EMethod _method, String ap, String stateName, Integer objectIndex,
        Integer refIndex) {

1086 }
1087 @Perm(requires="unique(this) in alive",
1088 ensures="unique(this) in alive")
1089   void startAPTSPARAM(EMethod _method, Integer J) {

1091 }

1093   void error(String state, String method) {

1095 }
1096 @Perm(requires="unique(this) in alive",
1097 ensures="unique(this) in alive")
1098   void startPrimeTSPARAM(EMethod method, Integer refIndex) {

1100 }
1101 @Perm(requires="unique(this) in alive",
1102 ensures="unique(this) in alive")
1103   void starPrimeAP(String ap, EClass _class, Integer objectIndex, Integer refIndex, String stateName) {

1105 }
1106 @Perm(requires="unique(this) in alive",
1107 ensures="unique(this) in alive")
1108   void modelPrimeConstructor(EClass _class, Integer objectIndex, Integer refIndex) {

1110 }
1111 @Perm(requires="unique(this) in alive",
1112 ensures="unique(this) in alive")
1113   void modelInheritance(EClass _class, Integer objectIndex, Integer refIndex) {

1115 }
1116 @Perm(requires="unique(this) in alive",
1117 ensures="unique(this) in alive")
1118   void modelPrimeAPStateInvariants(EClass _class, Integer refIndex, String stateName) {

1120 }
1121 @Perm(requires="unique(this) in alive",
1122 ensures="unique(this) in alive")
1123   int getClassIndex(String name) {
1124  return 0;

1126 }
1127 @Perm(requires="share(this) in alive",
```

```
1128  ensures="share(this) in alive")
1129    void modelPrimeAP(String ap, String className, Integer objectIndex, Integer refIndex) {

1131  }
1132  @Perm(requires="pure(this) in alive",
1133  ensures="pure(this) in alive")
1134    int getAPId(String ap) {
1135   return 0;

1137  }
1138  @Perm(requires="unique(this) in alive",
1139  ensures="unique(this) in alive")
1140    void modelEndPCMethod(EClass _class, EMethod _method, Integer objectIndex, Integer refIndex) {

1142  }
1143  @Perm(requires="unique(this) in alive",
1144  ensures="unique(this) in alive")
1145    void endMethod(EClass _class, EMethod _method, Integer objectIndex, Integer refIndex) {

1147  }
1148  @Perm(requires="unique(this) in alive",
1149  ensures="unique(this) in alive")
1150    void modelEndPCConstructor(EClass _class, EMethod _method, Integer objectIndex, Integer refIndex,
          EClass _currentClass) {

1152  }
1153  @Perm(requires="unique(this) in alive",
1154  ensures="unique(this) in alive")
1155    void modelPrimePCConstructor(EClass _class, Integer objectIndex, Integer refIndex, EClass
          _currentClass) {

1157  }
1158  @Perm(requires="unique(this) in alive",
1159  ensures="unique(this) in alive")
1160    void modelPrimePC(EClass _class, Integer objectIndex, Integer refIndex) {

1162  }
1163  @Perm(requires="unique(this) in alive",
1164  ensures="unique(this) in alive")
1165    void endPrimeAPTS(EClass _class, String methodName, String ap, String stateName, Integer objectIndex,
          Integer refIndex) {

1167  }
1168  @Perm(requires="unique(this) in alive",
1169  ensures="unique(this) in alive")
1170    void modelendConstructor(EClass _class, EMethod _method, Integer refIndex) {

1172  }
1173  @Perm(requires="unique(this) in alive",
1174  ensures="unique(this) in alive")
1175    void updateBoolStateInvariants(EClass _class, String methodName, String stateName, Integer objectIndex
          ) {

1177  }
1178  @Perm(requires="unique(this) in alive",
1179  ensures="unique(this) in alive")
1180    void updateStateInvariants(EClass _class, String methodName, String stateName, Integer refIndex) {

1182  }
1183  @Perm(requires="unique(this) in alive",
1184  ensures="unique(this) in alive")
1185    void updateState(String methodName, String state, EClass _class, Integer objectIndex) {

1187  }
1188  @Perm(requires="unique(this) in alive",
1189  ensures="unique(this) in alive")
1190    void modelState(EClass _class, Integer objectIndex, EMethod _method, String stateName) {

1192  }
1193  @Perm(requires="unique(this) in alive",
1194  ensures="unique(this) in alive")
1195    void modelStateInvariants(EClass _class, int refIndex, EMethod _method, String stateName) {

1197  }
1198  @Perm(requires="unique(this) in alive",
1199  ensures="unique(this) in alive")
1200    void modelBoolStateInvariants(EClass _class, Integer objectIndex, String stateName) {

1202  }
1203  @Perm(requires="unique(this) in alive",
1204  ensures="unique(this) in alive")
```

```
1205    void methodsReachability(EClass _class, Integer objectIndex, Integer refIndex) {

1207  }
1208  @Perm(requires="unique(this) in alive",
1209  ensures="unique(this) in alive")
1210    void modelAP(EClass _class, Integer objectIndex, Integer refIndex, String ap) {

1212  }
1213  @Perm(requires="share(this) in alive",
1214  ensures="share(this) in alive")
1215    void updateTokens(String ap, String className, Integer objectIndex, Integer refIndex) {

1217  }
1218  @Perm(requires="unique(this) in alive",
1219  ensures="unique(this) in alive")
1220    void endPrimeAPTSPARAM(EMethod method, Integer refIndex) {

1222  }
1223  @Perm(requires="share(this) in alive",
1224  ensures="share(this) in alive")
1225    void initilizeVariables(String className, int objectIndex, EClass _class, int modifier) {

1227  }
1228  @Perm(requires="share(this) in alive",
1229  ensures="share(this) in alive")
1230    void initilizeKVariables(String className, int objectIndex, int K) {

1232  }
1233  @Perm(requires="share(this) in alive",
1234  ensures="share(this) in alive")
1235    void defineVariables(String className, int objectIndex, EClass _class, int modifier) {

1237  }
1238  @Perm(requires="share(this) in alive",
1239  ensures="share(this) in alive")
1240    void defineKVariables(String className, int objectIndex, EClass _class, int K) {

1242  }
1243  @Perm(requires="pure(this) in alive",
1244  ensures="pure(this) in alive")
1245    boolean isPrivateAndIndexEqualToZero(int refIndex, EField _field) {
1246   return 0;

1248  }
1249  @Perm(requires="share(this) in alive",
1250  ensures="share(this) in alive")
1251    void generateSMCmodelPlugin(EPackage _pkg, int testType) {

1253  }
1254  @Perm(requires="unique(this) in alive",
1255  ensures="unique(this) in alive")
1256    void createAlias() {

1258  }
1259  @Perm(requires="unique(this) in alive",
1260  ensures="unique(this) in alive")
1261    void addIndexes() {

1263  }
1264  @Perm(requires="unique(this) in alive",
1265  ensures="unique(this) in alive")
1266    void createDimensionsObject(EClass _class) {

1268  }
1269  @Perm(requires="unique(this) in alive",
1270  ensures="unique(this) in alive")
1271    void createDimensionAsField(EClass _class, EDim _dim, int count) {

1273  }
1274  @Perm(requires="unique(this) in alive",
1275  ensures="unique(this) in alive")
1276    void createParentObject(EClass _class) {

1278  }
1279  @Perm(requires="unique(this) in alive",
1280  ensures="unique(this) in alive")
1281    void createParentAsField(EClass _class, EClass _currentClass) {

1283  }
1284  @Perm(requires="unique(this) in alive",
1285  ensures="unique(this) in alive")
```

```
1286   void addInvariantStateIndex(EClass _class) {

1288 }
1289 @Perm(requires="unique(this) in alive",
1290 ensures="unique(this) in alive")
1291   void setInvariantVariableType(EClass _class, EInvariant inv) {

1293 }
1294 @Perm(requires="unique(this) in alive",
1295 ensures="unique(this) in alive")
1296   void Spec() {

1298 }
1299 @Perm(requires="unique(this) in alive",
1300 ensures="unique(this) in alive")
1301   void statesAdjancyMatrix(EClass _class, Integer objectIndex) {

1303 }
1304 @Perm(requires="unique(this) in alive",
1305 ensures="unique(this) in alive")
1306   void concurrentMethods(EClass _class, Integer objectIndex, Integer refIndex) {

1308 }
1309 @Perm(requires="share(this) in alive",
1310 ensures="share(this) in alive")
1311   void sinkStates() {

1313 }

1315 }ENDOFCLASS

1317 @ClassStates({@State(name = "alive")})

1319 class EField {
1320 @Perm(ensures="unique(this) in alive")
1321 EField() {   }

1323 @Perm(requires="unique(this) in alive",
1324 ensures="unique(this) in alive")
1325  public String getName() {
1326  return null;

1328 }
1329 @Perm(requires="pure(this) in alive",
1330 ensures="pure(this) in alive")
1331  public int getObjectIndex() {
1332  return 0;

1334 }
1335 @Perm(requires="unique(this) in alive",
1336 ensures="unique(this) in alive")
1337  public String getType() {
1338  return null;

1340 }
1341 @Perm(requires="pure(this) in alive",
1342 ensures="pure(this) in alive")
1343  public int getClassIndex() {
1344  return 0;

1346 }
1347 @Perm(requires="pure(this) in alive",
1348 ensures="pure(this) in alive")
1349  public int getModifier() {
1350  return 0;

1352 }
1353 @Perm(requires="share(this) in alive",
1354 ensures="share(this) in alive")
1355  public void setName(String str) {

1357 }
1358 @Perm(requires="share(this) in alive",
1359 ensures="share(this) in alive")
1360  public void setType(String str) {

1362 }
1363 @Perm(requires="share(this) in alive",
1364 ensures="share(this) in alive")
1365  public void setModifier(int mod) {
```

```
1367 }
1368 @Perm(requires="share(this) in alive",
1369 ensures="share(this) in alive")
1370  public void setClassIndex(int classIndex) {

1372 }
1373 @Perm(requires="share(this) in alive",
1374 ensures="share(this) in alive")
1375  public void setObjectIndex(int objectIndex) {

1377 }

1379 }ENDOFCLASS

1381 @ClassStates({@State(name = "alive")})

1383 class EDim {
1384 @Perm(ensures="unique(this) in alive")
1385 EDim() {   }

1387 @Perm(requires="pure(this) in alive",
1388 ensures="pure(this) in alive")
1389  public ArrayList<String> getValues() {
1390  return null;

1392 }
1393 @Perm(requires="share(this) in alive",
1394 ensures="share(this) in alive")
1395  public void addValue(String str) {

1397 }
1398 @Perm(requires="full(this) in alive",
1399 ensures="full(this) in alive")
1400  public void setName(String str) {

1402 }
1403 @Perm(requires="pure(this) in alive",
1404 ensures="pure(this) in alive")
1405  public String getName(String str) {
1406  return null;

1408 }

1410 }ENDOFCLASS

1412 @ClassStates({@State(name = "alive")})

1414 class EParameter {
1415 @Perm(ensures="unique(this) in alive")
1416 EParameter() {   }

1418 @Perm(requires="immutable(this) in alive",
1419 ensures="immutable(this) in alive")
1420  public LinkedList<ESpecification> getRequiresAPTS() {
1421  return null;

1423 }
1424 @Perm(requires="pure(this) in alive",
1425 ensures="pure(this) in alive")
1426  public String getType() {
1427  return null;

1429 }
1430 @Perm(requires="immutable(this) in alive",
1431 ensures="immutable(this) in alive")
1432  public LinkedList<ESpecification> getEnsuresAPTS() {
1433  return null;

1435 }
1436 @Perm(requires="unique(this) in alive",
1437 ensures="unique(this) in alive")
1438  public String getName() {
1439  return null;

1441 }
1442 @Perm(requires="pure(this) in alive",
1443 ensures="pure(this) in alive")
1444  public int getNumber() {
1445  return 0;

1447 }
```

```
@Perm(requires="full(this) in alive",
ensures="full(this) in alive")
 public void setNumber(int n) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setName(String str) {

}
@Perm(requires="full(this) in alive",
ensures="full(this) in alive")
 public void setType(String str) {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EState {
@Perm(ensures="unique(this) in alive")
EState() {   }

@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getName() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public LinkedList<EInvariant> getInvariants() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public LinkedList<EBoolInvariant> getBoolInvariants() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public int getStateIndex() {
 return 0;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public int isReachable() {
 return 0;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setReachability(int value) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public Boolean isReachableState() {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void addBoolInvariant(EBoolInvariant inv) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void addInvariant(EInvariant inv) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setIndex(int stateIndex) {

}
```

```
}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EInvariant {
@Perm(ensures="unique(this) in alive")
EInvariant() {   }

@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getAP() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getVariableType() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getVariable() {
 return null;

}
@Perm(requires="pure(this) in alive",
ensures="pure(this) in alive")
 public String getStateName() {
 return null;

}
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
 public LinkedList<EInvariant> getStateInvariants(EPackage _pkg) {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void setVariableType(String type) {

}

 public void setStateIndex(int stateIndex) {

}
@Perm(requires="full(this) in alive",
ensures="full(this) in alive")
 public void setAP(String str) {

}
@Perm(requires="full(this) in alive",
ensures="full(this) in alive")
 public void setVariable(String str) {

}
@Perm(requires="full(this) in alive",
ensures="full(this) in alive")
 public void setState(String str) {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class EBoolInvariant {
@Perm(ensures="unique(this) in alive")
EBoolInvariant() {   }

@Perm(requires="immutable(this) in alive",
ensures="immutable(this) in alive")
 public String getVariable() {
 return null;

}
@Perm(requires="immutable(this) in alive",
ensures="immutable(this) in alive")
 public String getValue() {
 return null;
```

```
1611 }

1613 }ENDOFCLASS

1615 @ClassStates({@State(name = "alive")})

1617 class EGrarphWriter {
1618 @Perm(ensures="unique(this) in alive")
1619 EGrarphWriter() {   }

1621 @Perm(requires="unique(this) in alive",
1622 ensures="unique(this) in alive")
1623   void addTrnsitions(String str) {

1625 }
1626 @Perm(requires="share(this) in alive",
1627 ensures="share(this) in alive")
1628   void parseMethodReachability(String str) {

1630 }
1631 @Perm(requires="unique(this) in alive",
1632 ensures="unique(this) in alive")
1633   void createGraph() {

1635 }
1636 @Perm(requires="pure(this) in alive",
1637 ensures="pure(this) in alive")
1638   int getNumberofUnReachableMethods() {
1639  return 0;

1641 }
1642 @Perm(requires="share(this) in alive",
1643 ensures="share(this) in alive")
1644   void setNumberofUnReachableMethods() {

1646 }

1648 }ENDOFCLASS

1650 @ClassStates({@State(name = "alive")})

1652 class EOutputLatex {
1653 @Perm(ensures="unique(this) in alive")
1654 EOutputLatex() {   }

1656 @Perm(requires="unique(this) in alive",
1657 ensures="unique(this) in alive")
1658   void create_CommandLine() {

1660 }
1661 @Perm(requires="share(this) in alive",
1662 ensures="share(this) in alive")
1663   void addUsePackages() {

1665 }
1666 @Perm(requires="unique(this) in alive",
1667 ensures="unique(this) in alive")
1668   void writeToLatex() {

1670 }
1671 @Perm(requires="unique(this) in alive",
1672 ensures="unique(this) in alive")
1673   void WriteSummary() {

1675 }
1676 @Perm(requires="share(this) in alive",
1677 ensures="share(this) in alive")
1678   void addSummaryTableColumns() {

1680 }
1681 @Perm(requires="share(this) in alive",
1682 ensures="share(this) in alive")
1683   void addSummaryTableHeaders() {

1685 }
1686 @Perm(requires="unique(this) in alive",
1687 ensures="unique(this) in alive")
1688   void addSummaryTableRows() {

1690 }
```

```
1691  @Perm(requires="unique(this) in alive",
1692  ensures="unique(this) in alive")
1693    void writeRequiresClauseSatisfiabilty(EClass _class) {

1695  }
1696  @Perm(requires="share(this) in alive",
1697  ensures="share(this) in alive")
1698    void writeStateTransitionMatrix(EClass _class) {

1700  }
1701  @Perm(requires="share(this) in alive",
1702  ensures="share(this) in alive")
1703    void addSTMNumberofColumns(EClass _class) {

1705  }
1706  @Perm(requires="share(this) in alive",
1707  ensures="share(this) in alive")
1708    void addSTMColumnsHeaders(EClass _class) {

1710  }
1711  @Perm(requires="share(this) in alive",
1712  ensures="share(this) in alive")
1713    void addSTMRows(EClass _class) {

1715  }
1716  @Perm(requires="share(this) in alive",
1717  ensures="share(this) in alive")
1718    String getStateReachabilityValue(EState _state, EState __state) {
1719   return null;

1721  }
1722  @Perm(requires="unique(this) in alive",
1723  ensures="unique(this) in alive")
1724    void writeMethodConcurrencyMatrix(EClass _class) {

1726  }
1727  @Perm(requires="share(this) in alive",
1728  ensures="share(this) in alive")
1729    void addConcurrencyMatrixColumns(EClass _class) {

1731  }
1732  @Perm(requires="unique(this) in alive",
1733  ensures="unique(this) in alive")
1734    void addConcurrencyMatrixHeaders(EClass _class) {

1736  }
1737  @Perm(requires="unique(this) in alive",
1738  ensures="unique(this) in alive")
1739    void addConcurrencyMatrixRows(EClass _class) {

1741  }
1742  @Perm(requires="unique(this) in alive",
1743  ensures="unique(this) in alive")
1744    String getConcurrencyValue(EMethod _method, EMethod __method) {
1745   return null;

1747  }
1748  @Perm(requires="share(this) in alive",
1749  ensures="share(this) in alive")
1750    void writeAbbervations() {

1752  }
1753  @Perm(requires="share(this) in alive",
1754  ensures="share(this) in alive")
1755    void reset() {

1757  }
1758  @Perm(requires="unique(this) in alive",
1759  ensures="unique(this) in alive")
1760    void setText(String str) {

1762  }
1763  @Perm(requires="unique(this) in alive",
1764  ensures="unique(this) in alive")
1765    void parseRequires(String str) {

1767  }
1768  @Perm(requires="unique(this) in alive",
1769  ensures="unique(this) in alive")
1770    EMethod getMethod(String className, String methodName) {
1771   return null;
```

```
1773 }
1774 @Perm(requires="unique(this) in alive",
1775 ensures="unique(this) in alive")
1776   void parseTransitions(String str) {

1778 }
1779 @Perm(requires="unique(this) in alive",
1780 ensures="unique(this) in alive")
1781   void parseConcurrentMethods(String str) {

1783 }
1784 @Perm(requires="share(this) in alive",
1785 ensures="share(this) in alive")
1786   void parseSinkStates(String str) {

1788 }
1789 @Perm(requires="unique(this) in alive",
1790 ensures="unique(this) in alive")
1791   void create_Plugin() {

1793 }

1795 }ENDOFCLASS

1797 @ClassStates({@State(name = "alive")})

1799 class WorkspaceUtilities {
1800 @Perm(ensures="unique(this) in alive")
1801 WorkspaceUtilities() {   }


1804   ASTNode getASTNodeFromCompilationUnit(ICompilationUnit compUnit) {
1805  return null;

1807 }
1808 @Perm(requires="share(this) in alive",
1809 ensures="share(this) in alive")
1810   List<ICompilationUnit> scanForCompilationUnits() {
1811  return null;

1813 }
1814 @Perm(requires="share(this) in alive",
1815 ensures="share(this) in alive")
1816   List<ICompilationUnit> collectCompilationUnits(IJavaElement javaElement) {
1817  return null;

1819 }
1820 @Perm(requires="share(this) in alive",
1821 ensures="share(this) in alive")
1822   List<ICompilationUnit> findCompilationUnits(List<String> files) {
1823  return null;

1825 }

1827   String getWorkspaceRelativeName(IJavaElement element) {
1828  return null;

1830 }

1832   Map<ICompilationUnit,ASTNode> parseCompilationUnits(List<ICompilationUnit> compilationUnits) {
1833  return null;

1835 }

1837   List<MethodDeclaration> scanForMethodDeclarations(Map<ICompilationUnit,ASTNode>
        compilationUnitToASTNode) {
1838  return null;

1840 }

1842   List<MethodDeclaration> scanForMethodDeclarationsFromAST(ASTNode node) {
1843  return null;

1845 }

1847 }ENDOFCLASS

1849 @ClassStates({@State(name = "alive")})

1851 class SMCVisitor {
```

```
1852 @Perm(ensures="unique(this) in alive")
1853 SMCVisitor() {   }

1855 @Perm(requires="share(this) in alive",
1856 ensures="share(this) in alive")
1857  private void addUnparsedSpecifications(String annotation) {

1859 }

1861  public void preVisit(ASTNode node) {

1863 }

1865  public void postVisit(ASTNode node) {

1867 }
1868 @Perm(requires="unique(this) in alive",
1869 ensures="unique(this) in alive")
1870  public boolean visit(PackageDeclaration node) {
1871  return 0;

1873 }

1875  public void endVisit(PackageDeclaration node) {

1877 }
1878 @Perm(requires="unique(this) in alive",
1879 ensures="unique(this) in alive")
1880  private void callParser(String annotation) {

1882 }

1884 }ENDOFCLASS

1886 @ClassStates({@State(name = "alive")})

1888 class PulseSettings {
1889 @Perm(ensures="unique(this) in alive")
1890 PulseSettings() {   }

1892 @Perm(requires="pure(this) in alive",
1893 ensures="pure(this) in alive")
1894   int getInheritance() {
1895  return 0;

1897 }
1898 @Perm(requires="pure(this) in alive",
1899 ensures="pure(this) in alive")
1900   int getFullModel() {
1901  return 0;

1903 }
1904 @Perm(requires="pure(this) in alive",
1905 ensures="pure(this) in alive")
1906   int getInvariants() {
1907  return 0;

1909 }
1910 @Perm(requires="pure(this) in alive",
1911 ensures="pure(this) in alive")
1912   int getDimensions() {
1913  return 0;

1915 }
1916 @Perm(requires="share(this) in alive",
1917 ensures="share(this) in alive")
1918   void setInvariants(int x) {

1920 }
1921 @Perm(requires="share(this) in alive",
1922 ensures="share(this) in alive")
1923   void setAliasPerObject(int x) {

1925 }
1926 @Perm(requires="share(this) in alive",
1927 ensures="share(this) in alive")
1928   void setFullModel(int x) {

1930 }
1931 @Perm(requires="share(this) in alive",
1932 ensures="share(this) in alive")
```

```
1933    void setDimensions(int x) {

1935  }
1936  @Perm(requires="share(this) in alive",
1937  ensures="share(this) in alive")
1938    void setInheritance(int x) {

1940  }
1941  @Perm(requires="pure(this) in alive",
1942  ensures="pure(this) in alive")
1943    int getAliasPerObject() {
1944   return 0;

1946  }

1948  }ENDOFCLASS

1950  @ClassStates({@State(name = "alive")})

1952  class specificationStruct {
1953  @Perm(ensures="unique(this) in alive")
1954  specificationStruct() {   }


1957  }ENDOFCLASS

1959  @ClassStates({@State(name = "alive")})

1961  class Clause {
1962  @Perm(ensures="unique(this) in alive")
1963  Clause() {   }


1966  }ENDOFCLASS

1968  @ClassStates({@State(name = "alive")})

1970  class Signature {
1971  @Perm(ensures="unique(this) in alive")
1972  Signature() {   }


1975  }ENDOFCLASS

1977  @ClassStates({@State(name = "alive")})

1979  class MethodFindVisitor {
1980  @Perm(ensures="unique(this) in alive")
1981  MethodFindVisitor() {   }

1983  @Perm(requires="unique(this) in alive",
1984  ensures="unique(this) in alive")
1985   public boolean visit(MethodDeclaration methodDeclaration) {
1986   return 0;

1988  }

1990  }ENDOFCLASS

1992  @ClassStates({@State(name = "alive")})

1994  class Activator {
1995  @Perm(ensures="unique(this) in alive")
1996  Activator() {   }

1998  @Perm(requires="share(this) in alive",
1999  ensures="share(this) in alive")
2000   public void start(BundleContext context) {

2002  }
2003  @Perm(requires="unique(this) in alive",
2004  ensures="unique(this) in alive")
2005   public void stop(BundleContext context) {

2007  }
2008  @Perm(requires="pure(this) in alive",
2009  ensures="pure(this) in alive")
2010    Activator getDefault() {
2011   return null;

2013  }
```

```
@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  ImageDescriptor getImageDescriptor(String path) {
 return null;

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class GAPHandler {
@Perm(ensures="unique(this) in alive")
GAPHandler() {   }


 public void addHandlerListener(IHandlerListener handlerListener) {

}

 public void dispose() {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public Object execute(ExecutionEvent event) {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 private void extractSettings(ExecutionEvent event) {

}

 public boolean isEnabled() {
 return 0;

}

 public boolean isHandled() {
 return 0;

}

 public void removeHandlerListener(IHandlerListener handlerListener) {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class GAPIFileAction {
@Perm(ensures="unique(this) in alive")
GAPIFileAction() {   }

@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void selectionChanged(IAction action, ISelection selection) {

}

 public void setActivePart(IAction action, IWorkbenchPart targetPart) {

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
 public void run(IAction action) {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class Anonymous {
@Perm(ensures="unique(this) in alive")
Anonymous() {   }

@Perm(requires="unique(this) in alive",
```

```
ensures="unique(this) in alive")
 protected IStatus run(IProgressMonitor monitor) {
 return null;

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class Main {
@Perm(ensures="unique(this) in alive")
Main() {   }

@Perm(requires="unique(this) in alive",
ensures="unique(this) in alive")
  void main(String[] args) {

}

  String testRead(String file) {
 return null;

}
@Perm(requires="share(this) in alive",
ensures="share(this) in alive")
  void seprateJavaFile(String str) {

}

  void anTest() {

}

}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class TypestateReturn {
@Perm(ensures="unique(this) in alive")
TypestateReturn() {   }


}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class AtApPermissionReturn {
@Perm(ensures="unique(this) in alive")
AtApPermissionReturn() {   }


}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class AccesspermissionReturn {
@Perm(ensures="unique(this) in alive")
AccesspermissionReturn() {   }


}ENDOFCLASS

@ClassStates({@State(name = "alive")})

class PluralLexer {
@Perm(ensures="unique(this) in alive")
PluralLexer() {   }


 public String getGrammarFileName() {
 return null;

}
@Perm(requires="immutable(this) in alive",
ensures="immutable(this) in alive")
  void mATFULL() {

}
@Perm(requires="immutable(this) in alive",
ensures="immutable(this) in alive")
```

```
2176    void mATPURE() {

2178  }
2179  @Perm(requires="immutable(this) in alive",
2180  ensures="immutable(this) in alive")
2181    void mATIMMUTABLE() {

2183  }
2184  @Perm(requires="immutable(this) in alive",
2185  ensures="immutable(this) in alive")
2186    void mATSHARE() {

2188  }
2189  @Perm(requires="immutable(this) in alive",
2190  ensures="immutable(this) in alive")
2191    void mATUNIQUE() {

2193  }
2194  @Perm(requires="immutable(this) in alive",
2195  ensures="immutable(this) in alive")
2196    void mPUBLICBEHAVIOR() {

2198  }
2199  @Perm(requires="immutable(this) in alive",
2200  ensures="immutable(this) in alive")
2201    void mFULL() {

2203  }
2204  @Perm(requires="immutable(this) in alive",
2205  ensures="immutable(this) in alive")
2206    void mPURE() {

2208  }
2209  @Perm(requires="immutable(this) in alive",
2210  ensures="immutable(this) in alive")
2211    void mIMMUTABLE() {

2213  }
2214  @Perm(requires="immutable(this) in alive",
2215  ensures="immutable(this) in alive")
2216    void mSHARE() {

2218  }
2219  @Perm(requires="immutable(this) in alive",
2220  ensures="immutable(this) in alive")
2221    void mUNIQUE() {

2223  }
2224  @Perm(requires="immutable(this) in alive",
2225  ensures="immutable(this) in alive")
2226    void mNONE() {

2228  }
2229  @Perm(requires="immutable(this) in alive",
2230  ensures="immutable(this) in alive")
2231    void mLSBRACKET() {

2233  }
2234  @Perm(requires="immutable(this) in alive",
2235  ensures="immutable(this) in alive")
2236    void mRSBRACKET() {

2238  }
2239  @Perm(requires="immutable(this) in alive",
2240  ensures="immutable(this) in alive")
2241    void mPERM() {

2243  }
2244  @Perm(requires="immutable(this) in alive",
2245  ensures="immutable(this) in alive")
2246    void mEQUAL() {

2248  }
2249  @Perm(requires="immutable(this) in alive",
2250  ensures="immutable(this) in alive")
2251    void mEQUALOPERATOR() {

2253  }
2254  @Perm(requires="immutable(this) in alive",
2255  ensures="immutable(this) in alive")
2256    void mIN() {
```

```
2258  }
2259  @Perm(requires="immutable(this) in alive",
2260  ensures="immutable(this) in alive")
2261    void mTHIS() {

2263  }
2264  @Perm(requires="immutable(this) in alive",
2265  ensures="immutable(this) in alive")
2266    void mRESULT() {

2268  }
2269  @Perm(requires="immutable(this) in alive",
2270  ensures="immutable(this) in alive")
2271    void mPARAM() {

2273  }
2274  @Perm(requires="immutable(this) in alive",
2275  ensures="immutable(this) in alive")
2276    void mREQUIRES() {

2278  }
2279  @Perm(requires="immutable(this) in alive",
2280  ensures="immutable(this) in alive")
2281    void mENSURES() {

2283  }
2284  @Perm(requires="immutable(this) in alive",
2285  ensures="immutable(this) in alive")
2286    void mQUOTE() {

2288  }
2289  @Perm(requires="immutable(this) in alive",
2290  ensures="immutable(this) in alive")
2291    void mAND() {

2293  }
2294  @Perm(requires="immutable(this) in alive",
2295  ensures="immutable(this) in alive")
2296    void mUSE() {

2298  }
2299  @Perm(requires="immutable(this) in alive",
2300  ensures="immutable(this) in alive")
2301    void mUSEFIELDS() {

2303  }
2304  @Perm(requires="immutable(this) in alive",
2305  ensures="immutable(this) in alive")
2306    void mPUNCTUATION() {

2308  }
2309  @Perm(requires="immutable(this) in alive",
2310  ensures="immutable(this) in alive")
2311    void mCASES() {

2313  }
2314  @Perm(requires="immutable(this) in alive",
2315  ensures="immutable(this) in alive")
2316    void mLCBRACKET() {

2318  }
2319  @Perm(requires="immutable(this) in alive",
2320  ensures="immutable(this) in alive")
2321    void mRCBRACKET() {

2323  }
2324  @Perm(requires="immutable(this) in alive",
2325  ensures="immutable(this) in alive")
2326    void mCLASSSTATES() {

2328  }
2329  @Perm(requires="immutable(this) in alive",
2330  ensures="immutable(this) in alive")
2331    void mREFINE() {

2333  }
2334  @Perm(requires="immutable(this) in alive",
2335  ensures="immutable(this) in alive")
2336    void mVALUE() {
```

```
2338  }
2339  @Perm(requires="immutable(this) in alive",
2340  ensures="immutable(this) in alive")
2341    void mSTATE() {

2343  }
2344  @Perm(requires="immutable(this) in alive",
2345  ensures="immutable(this) in alive")
2346    void mSTATES() {

2348  }
2349  @Perm(requires="immutable(this) in alive",
2350  ensures="immutable(this) in alive")
2351    void mDIM() {

2353  }
2354  @Perm(requires="immutable(this) in alive",
2355  ensures="immutable(this) in alive")
2356    void mNAME() {

2358  }
2359  @Perm(requires="immutable(this) in alive",
2360  ensures="immutable(this) in alive")
2361    void mINV() {

2363  }
2364  @Perm(requires="immutable(this) in alive",
2365  ensures="immutable(this) in alive")
2366    void mOPERATOR() {

2368  }
2369  @Perm(requires="immutable(this) in alive",
2370  ensures="immutable(this) in alive")
2371    void mSEMICOLON() {

2373  }
2374  @Perm(requires="immutable(this) in alive",
2375  ensures="immutable(this) in alive")
2376    void mLESS() {

2378  }
2379  @Perm(requires="immutable(this) in alive",
2380  ensures="immutable(this) in alive")
2381    void mLESSTHANEQUAL() {

2383  }
2384  @Perm(requires="immutable(this) in alive",
2385  ensures="immutable(this) in alive")
2386    void mGREATER() {

2388  }
2389  @Perm(requires="immutable(this) in alive",
2390  ensures="immutable(this) in alive")
2391    void mGREATERTHANEQUAL() {

2393  }
2394  @Perm(requires="immutable(this) in alive",
2395  ensures="immutable(this) in alive")
2396    void mANDD() {

2398  }
2399  @Perm(requires="immutable(this) in alive",
2400  ensures="immutable(this) in alive")
2401    void mOR() {

2403  }
2404  @Perm(requires="immutable(this) in alive",
2405  ensures="immutable(this) in alive")
2406    void mJMLSTART() {

2408  }
2409  @Perm(requires="immutable(this) in alive",
2410  ensures="immutable(this) in alive")
2411    void mJMLEND() {

2413  }
2414  @Perm(requires="immutable(this) in alive",
2415  ensures="immutable(this) in alive")
2416    void mPLUSMINUSOPERATOR() {

2418  }
```

```
2419 @Perm(requires="immutable(this) in alive",
2420 ensures="immutable(this) in alive")
2421   void mASSIGNABLE() {

2423 }
2424 @Perm(requires="immutable(this) in alive",
2425 ensures="immutable(this) in alive")
2426   void mNOTHING() {

2428 }
2429 @Perm(requires="immutable(this) in alive",
2430 ensures="immutable(this) in alive")
2431   void mEVERYTHING() {

2433 }
2434 @Perm(requires="immutable(this) in alive",
2435 ensures="immutable(this) in alive")
2436   void mGHOST() {

2438 }
2439 @Perm(requires="immutable(this) in alive",
2440 ensures="immutable(this) in alive")
2441   void mINT() {

2443 }
2444 @Perm(requires="immutable(this) in alive",
2445 ensures="immutable(this) in alive")
2446   void mINVARIANT() {

2448 }
2449 @Perm(requires="immutable(this) in alive",
2450 ensures="immutable(this) in alive")
2451   void mOLD() {

2453 }
2454 @Perm(requires="immutable(this) in alive",
2455 ensures="immutable(this) in alive")
2456   void mID() {

2458 }
2459 @Perm(requires="immutable(this) in alive",
2460 ensures="immutable(this) in alive")
2461   void mNUMBERS() {

2463 }
2464 @Perm(requires="immutable(this) in alive",
2465 ensures="immutable(this) in alive")
2466   void mWS() {

2468 }
2469 @Perm(requires="unique(this) in alive",
2470 ensures="unique(this) in alive")
2471  public void mTokens() {

2473 }

2475 }ENDOFCLASS

2477 @ClassStates({@State(name = "alive")})

2479 class DFA7 {
2480 @Perm(ensures="unique(this) in alive")
2481 DFA7() {   }


2484  public String getDescription() {
2485  return null;

2487 }

2489 }ENDOFCLASS

2491 @ClassStates({@State(name = "alive")})

2493 class EAPTypeState {
2494 @Perm(ensures="unique(this) in alive")
2495 EAPTypeState() {   }

2497 @Perm(requires="share(this) in alive",
2498 ensures="share(this) in alive")
2499  public void setAP(String str) {
```

```
2501 }
2502 @Perm(requires="unique(this) in alive",
2503 ensures="unique(this) in alive")
2504  public String getAP(String str) {
2505  return null;

2507 }
2508 @Perm(requires="share(this) in alive",
2509 ensures="share(this) in alive")
2510  public void setTS(String str) {

2512 }
2513 @Perm(requires="unique(this) in alive",
2514 ensures="unique(this) in alive")
2515  public String getTS() {
2516  return null;

2518 }

2520 }ENDOFCLASS
```