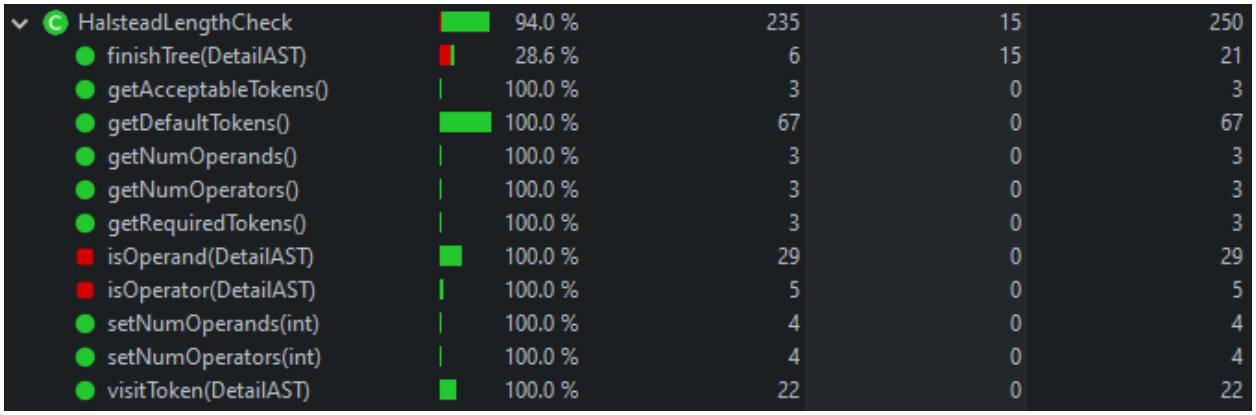
For all of these JUnit5 tests, testing finishTree is really difficult because it relies on Checkstyle's log method, which doesn't return data but logs directly, making it hard to verify output in tests. Plus, finishTree often resets internal counters or states right after logging, so we can't easily check values afterward. Standard tricks like mocks or spies don't work well here and can mess with test coverage, making this method tricky to test cleanly.

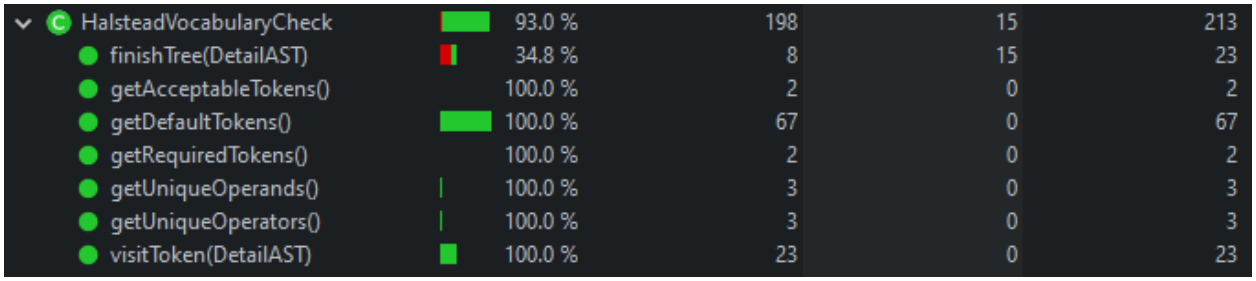
Category A

HalsteadLengthCheckTest



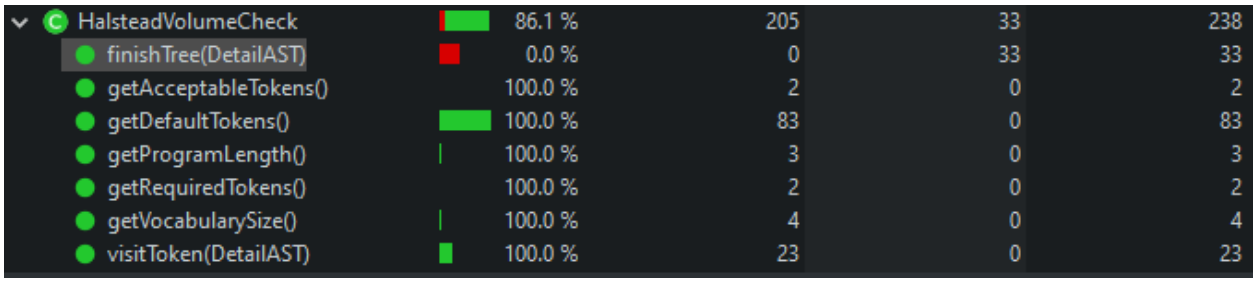
HalsteadLengthCheck	94.0 %	235	15	250
finishTree(DetailAST)	28.6 %	6	15	21
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	67	0	67
getNumOperands()	100.0 %	3	0	3
getNumOperators()	100.0 %	3	0	3
getRequiredTokens()	100.0 %	3	0	3
isOperand(DetailAST)	100.0 %	29	0	29
isOperator(DetailAST)	100.0 %	5	0	5
setNumOperands(int)	100.0 %	4	0	4
setNumOperators(int)	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	22	0	22

HalsteadVocabularyCheck



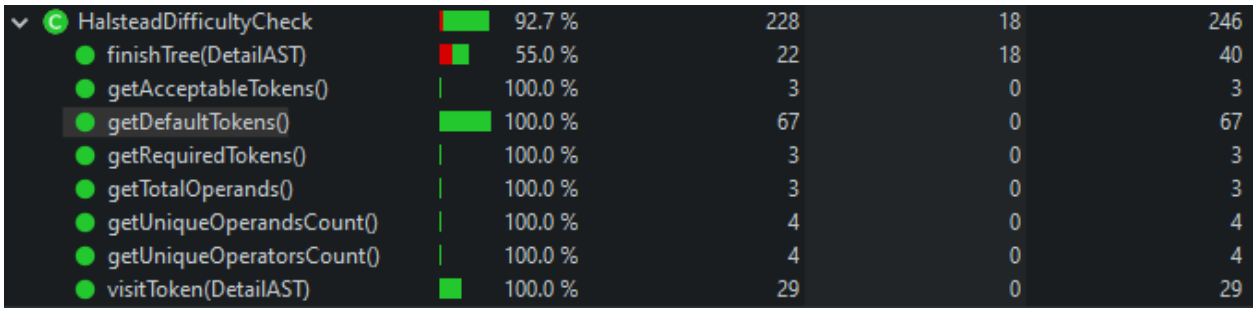
HalsteadVocabularyCheck	93.0 %	198	15	213
finishTree(DetailAST)	34.8 %	8	15	23
getAcceptableTokens()	100.0 %	2	0	2
getDefaultTokens()	100.0 %	67	0	67
getRequiredTokens()	100.0 %	2	0	2
getUniqueOperands()	100.0 %	3	0	3
getUniqueOperators()	100.0 %	3	0	3
visitToken(DetailAST)	100.0 %	23	0	23

HalsteadVolumeCheck



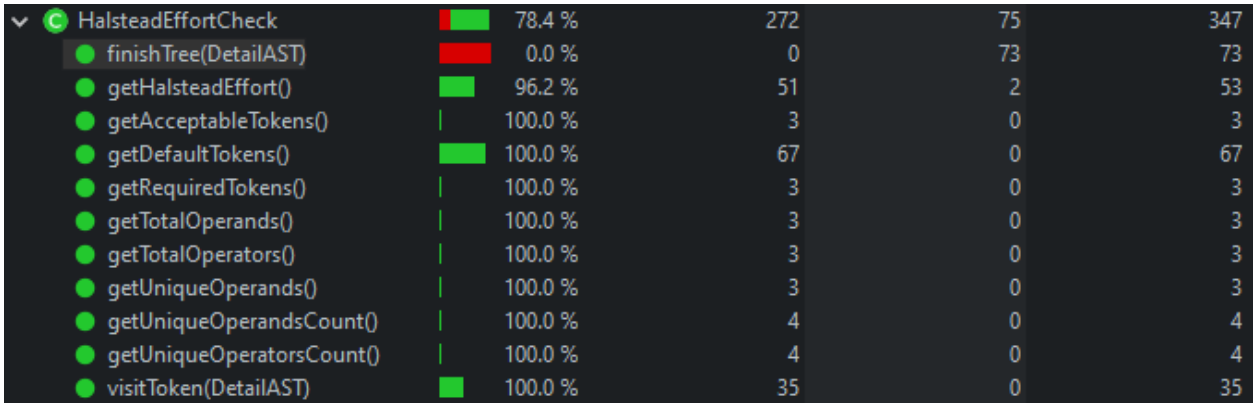
HalsteadVolumeCheck	86.1 %	205	33	238
finishTree(DetailAST)	0.0 %	0	33	33
getAcceptableTokens()	100.0 %	2	0	2
getDefaultTokens()	100.0 %	83	0	83
getProgramLength()	100.0 %	3	0	3
getRequiredTokens()	100.0 %	2	0	2
getVocabularySize()	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	23	0	23

HalsteadDifficultyCheck



HalsteadDifficultyCheck	92.7 %	228	18	246
finishTree(DetailAST)	55.0 %	22	18	40
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	67	0	67
getRequiredTokens()	100.0 %	3	0	3
getTotalOperands()	100.0 %	3	0	3
getUniqueOperandsCount()	100.0 %	4	0	4
getUniqueOperatorsCount()	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	29	0	29

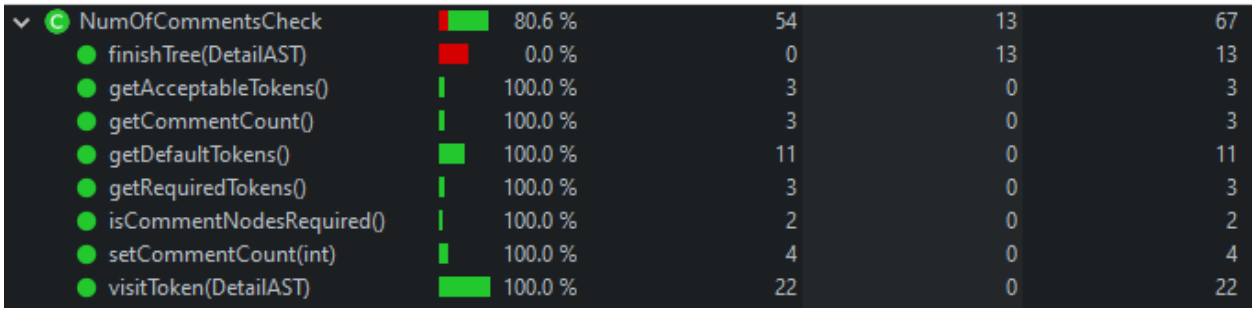
HalsteadEffortCheck



HalsteadEffortCheck	78.4 %	272	75	347
finishTree(DetailAST)	0.0 %	0	73	73
getHalsteadEffort()	96.2 %	51	2	53
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	67	0	67
getRequiredTokens()	100.0 %	3	0	3
getTotalOperands()	100.0 %	3	0	3
getTotalOperators()	100.0 %	3	0	3
getUniqueOperands()	100.0 %	3	0	3
getUniqueOperandsCount()	100.0 %	4	0	4
getUniqueOperatorsCount()	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	35	0	35

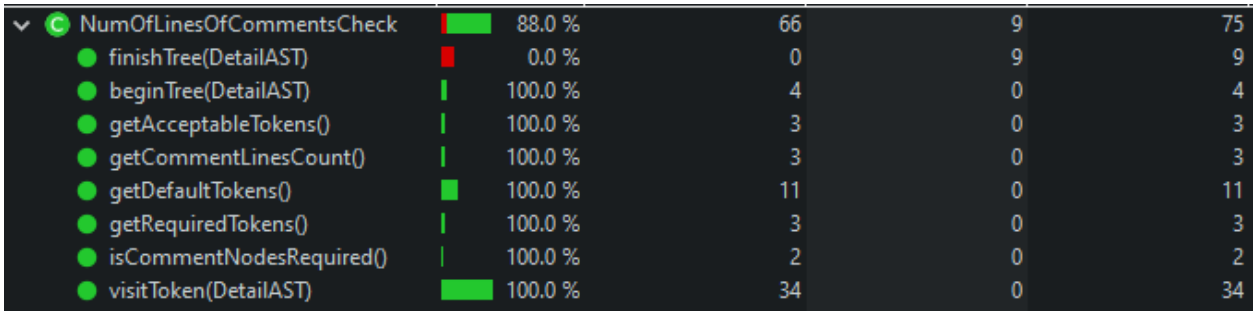
Category B

NumOfCommentsCheck



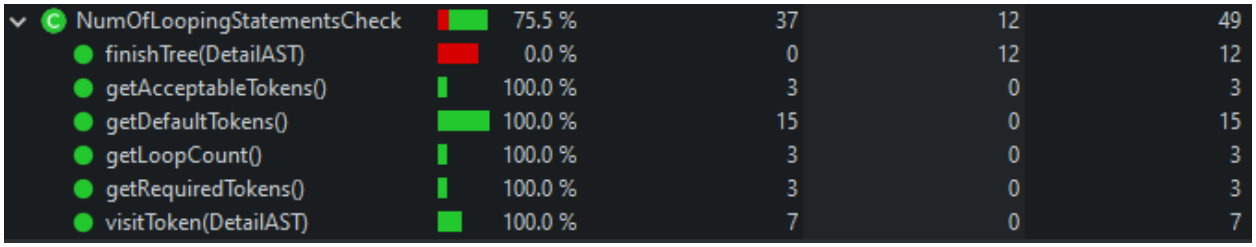
NumOfCommentsCheck	80.6 %	54	13	67
finishTree(DetailAST)	0.0 %	0	13	13
getAcceptableTokens()	100.0 %	3	0	3
getCommentCount()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	11	0	11
getRequiredTokens()	100.0 %	3	0	3
isCommentNodesRequired()	100.0 %	2	0	2
setCommentCount(int)	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	22	0	22

NumOfLinesOfCommentsCheck



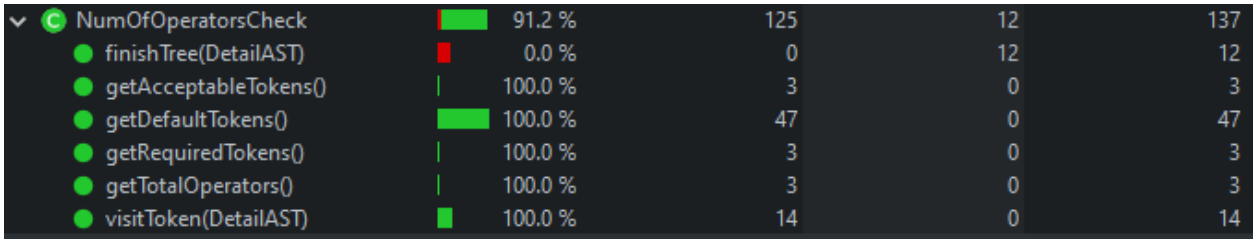
NumOfLinesOfCommentsCheck	88.0 %	66	9	75
finishTree(DetailAST)	0.0 %	0	9	9
beginTree(DetailAST)	100.0 %	4	0	4
getAcceptableTokens()	100.0 %	3	0	3
getCommentLinesCount()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	11	0	11
getRequiredTokens()	100.0 %	3	0	3
isCommentNodesRequired()	100.0 %	2	0	2
visitToken(DetailAST)	100.0 %	34	0	34

NumOfLoopingStatementsCheck



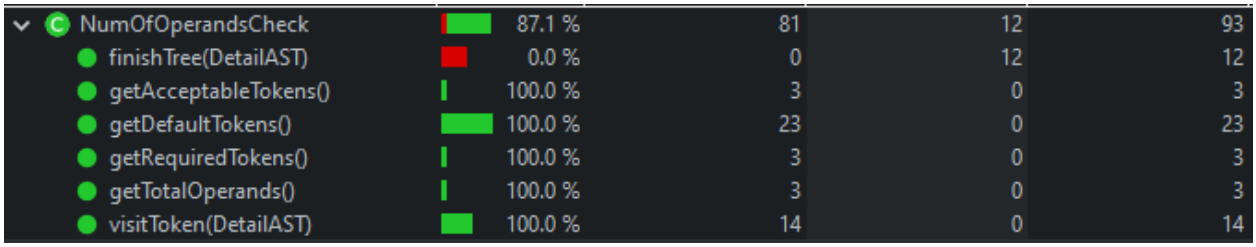
NumOfLoopingStatementsCheck	75.5 %	37	12	49
finishTree(DetailAST)	0.0 %	0	12	12
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	15	0	15
getLoopCount()	100.0 %	3	0	3
getRequiredTokens()	100.0 %	3	0	3
visitToken(DetailAST)	100.0 %	7	0	7

NumOfOperatorsCheck



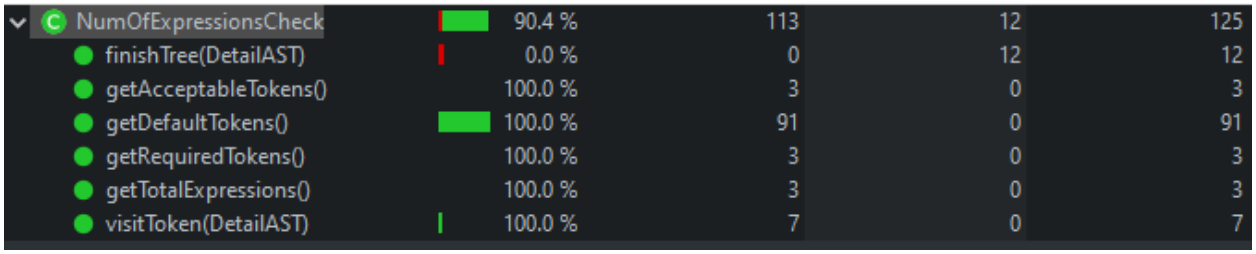
NumOfOperatorsCheck	91.2 %	125	12	137
finishTree(DetailAST)	0.0 %	0	12	12
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	47	0	47
getRequiredTokens()	100.0 %	3	0	3
getTotalOperators()	100.0 %	3	0	3
visitToken(DetailAST)	100.0 %	14	0	14

NumOfOperandsCheck



NumOfOperandsCheck	87.1 %	81	12	93
finishTree(DetailAST)	0.0 %	0	12	12
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	23	0	23
getRequiredTokens()	100.0 %	3	0	3
getTotalOperands()	100.0 %	3	0	3
visitToken(DetailAST)	100.0 %	14	0	14

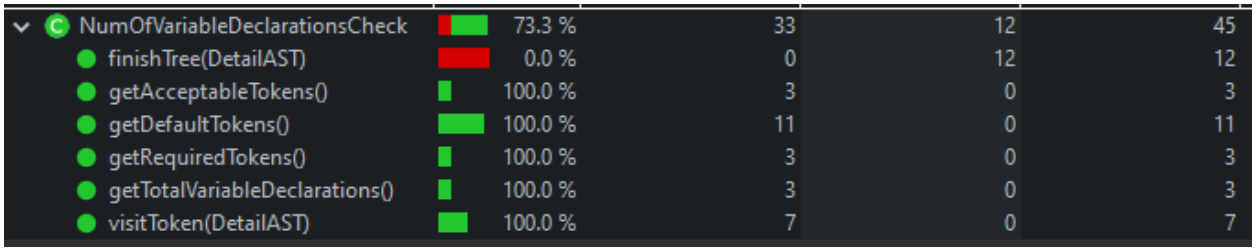
NumOfExpressionsCheck



NumOfExpressionsCheck	90.4 %	113	12	125
finishTree(DetailAST)	0.0 %	0	12	12
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	91	0	91
getRequiredTokens()	100.0 %	3	0	3
getTotalExpressions()	100.0 %	3	0	3
visitToken(DetailAST)	100.0 %	7	0	7

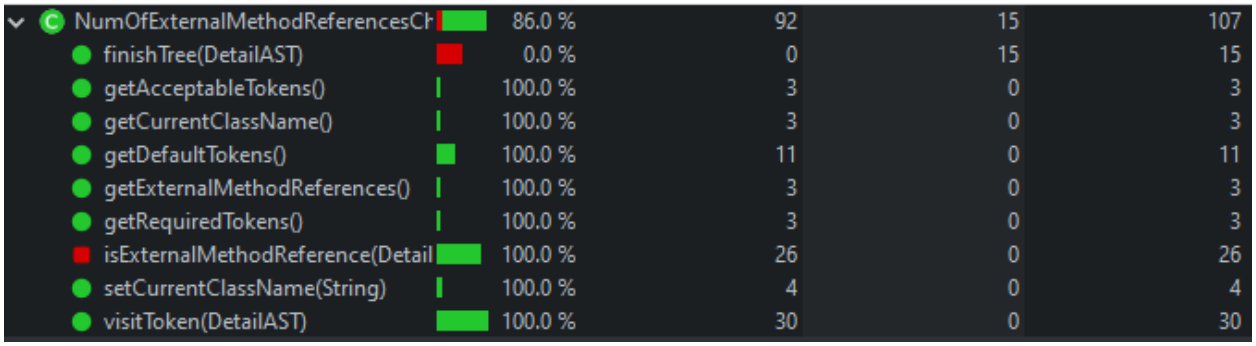
Extra Credit

NumOfVariableDeclarationsCheck



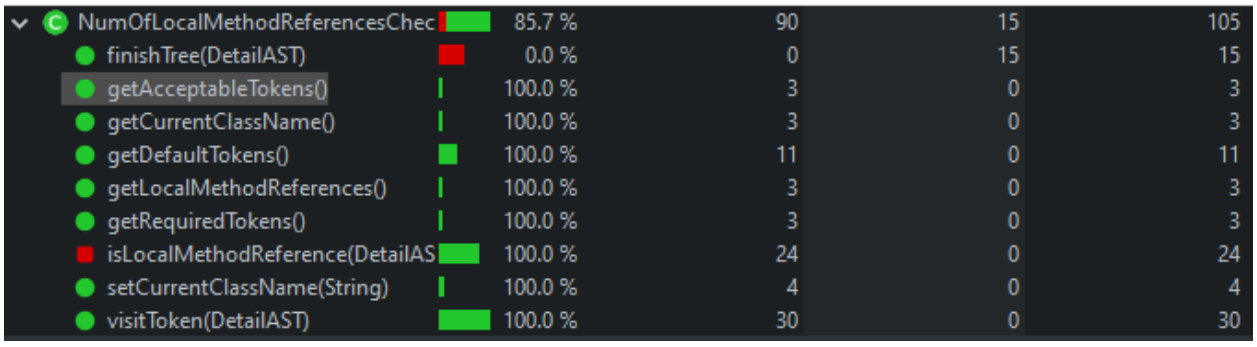
NumOfVariableDeclarationsCheck	73.3 %	33	12	45
finishTree(DetailAST)	0.0 %	0	12	12
getAcceptableTokens()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	11	0	11
getRequiredTokens()	100.0 %	3	0	3
getTotalVariableDeclarations()	100.0 %	3	0	3
visitToken(DetailAST)	100.0 %	7	0	7

NumOfExternalMethodReferencesCheck



NumOfExternalMethodReferencesCh	86.0 %	92	15	107
finishTree(DetailAST)	0.0 %	0	15	15
getAcceptableTokens()	100.0 %	3	0	3
getCurrentClassName()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	11	0	11
getExternalMethodReferences()	100.0 %	3	0	3
getRequiredTokens()	100.0 %	3	0	3
isExternalMethodReference(Detail	100.0 %	26	0	26
setCurrentClassName(String)	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	30	0	30

NumOfLocal Method ReferencesCheck



NumOfLocalMethodReferencesChec	85.7 %	90	15	105
finishTree(DetailAST)	0.0 %	0	15	15
getAcceptableTokens()	100.0 %	3	0	3
getCurrentClassName()	100.0 %	3	0	3
getDefaultTokens()	100.0 %	11	0	11
getLocalMethodReferences()	100.0 %	3	0	3
getRequiredTokens()	100.0 %	3	0	3
isLocalMethodReference(DetailAS	100.0 %	24	0	24
setCurrentClassName(String)	100.0 %	4	0	4
visitToken(DetailAST)	100.0 %	30	0	30