



CTIP 환경 구축_2차

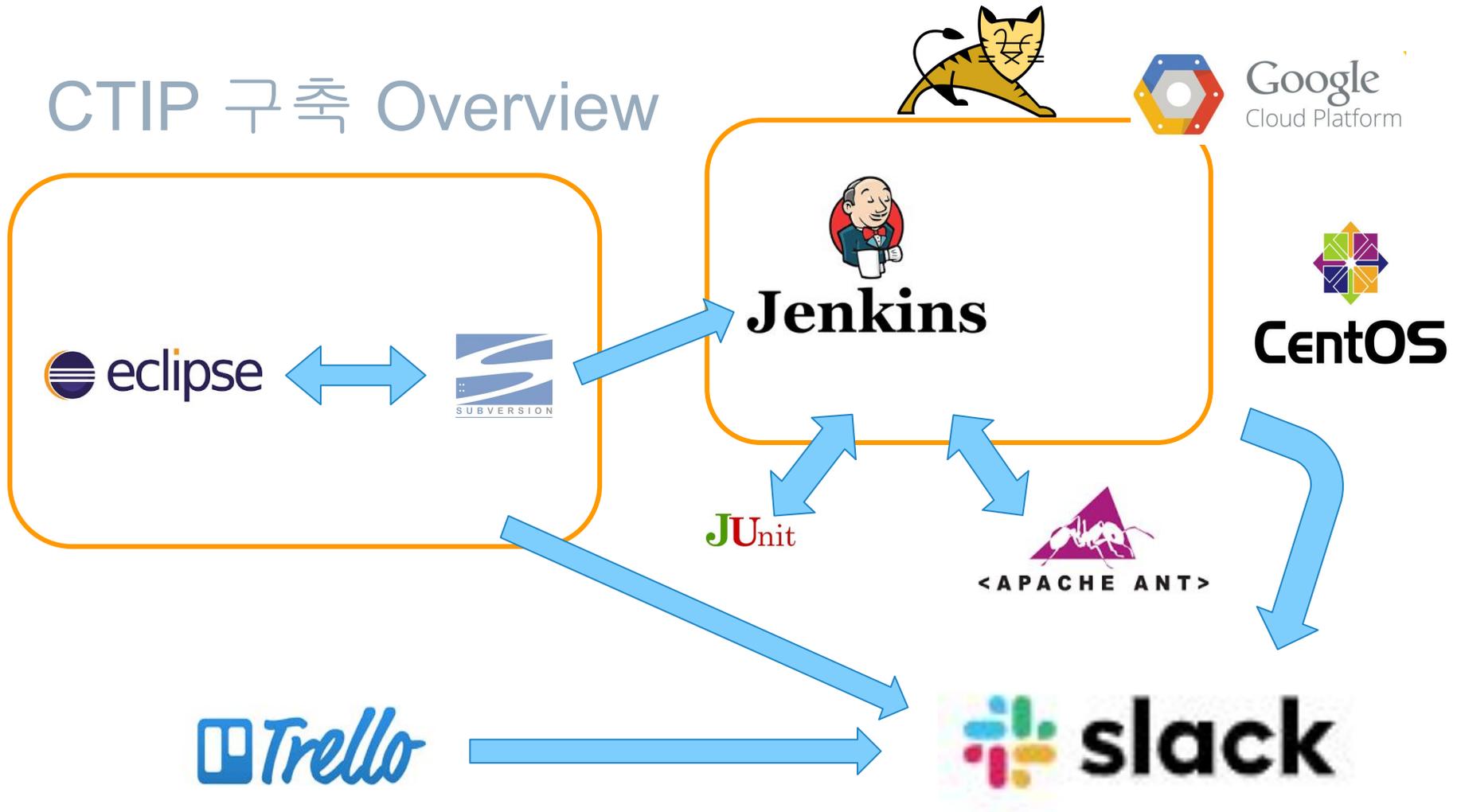
-5팀-
이지영 (팀장)
강민호
김정연
유경원

1. Aggregation
2. Static Analysis
3. Unit Test
4. System Test
5. 소프트웨어 V&V

1.

Aggregation

CTIP 구축 Overview



2.

Static Analysis

Static Analysis(findbugs)

findbugs: 해당 프로젝트의 코드 에러 및 일어날 수 있는 버그 요소들을 감지한다.



Java Projects - 지뢰찾기 (2020)/src/지뢰찾기/MineBox_Button.java - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Bug Explorer

- 지뢰찾기 (2020) (1)
 - Troubling (1)
 - High confidence (1)
 - Condition has no effect (1)
 - Useless condition: it's known that this.prop == 0

```
48 void leftPre:
49     if(this.r
50     this.
51     this.
52     mm.ch
53     return
54 }
55 if(this.c
56 if(this.r
57 if(p
58
59 }
60 mm ar
```

Bug Info

MineBox_Button.java: 57

Navigation

Useless condition: it's known that this.prop == 0 at Value this.prop == 0
Unreachable code at MineBox_Button.java:[line 58]

Bug: Useless condition: it's known that this condition always produces the same result before. Probably something else was meant.

Rank: Troubling (14), **confidence:** High
Pattern: UC_USELESS_CONDITION
Type: UC, **Category:** STYLE (Dodgy code)

XML output:

```
<BugInstance type="UC_USELESS_COND
<Class classname="지뢰찾기.MineBox
<SourceLine classname="지뢰찾기.
</Class>
<Method classname="지뢰찾기.MineBox
<SourceLine classname="지뢰찾기.
</Method>
<String value="this.prop == 0"/>
```

Bug Reviews

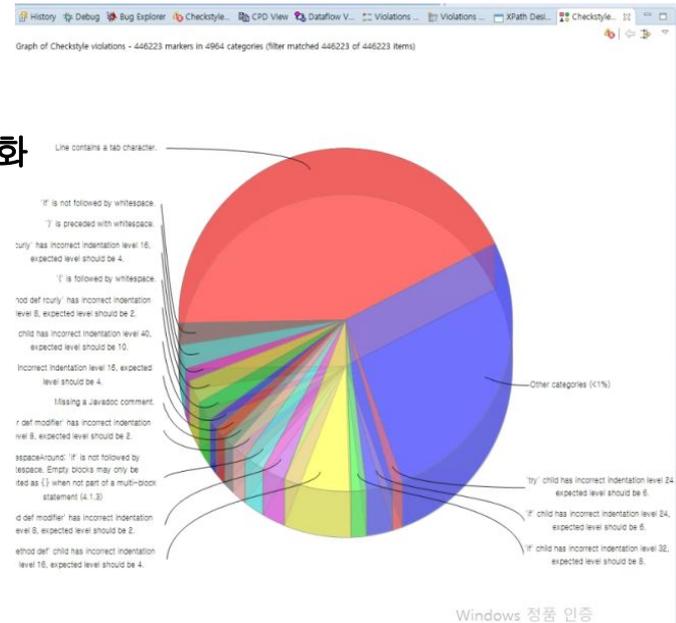
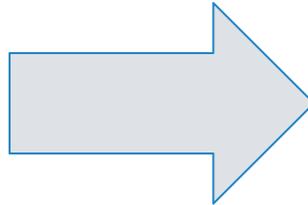
- Scariest (4)
 - High confidence (2)
 - Call to equals() comparing different types (1)
 - Call to String.equals(Integer) in samw.common.Constants\$Channel.parse(int) [Scariest(1), High confidence]
 - No relationship between generic parameter and method argument (1)
 - Short is incompatible with expected argument type AbilDef in samw.bean.PersonCardDef.getAbilList() [Scariest(1), High confidence]
 - Normal confidence (2)
 - Invocation of equals() on an array, which is equivalent to == (1)
 - Using .equals to compare two String[]'s, (equivalent to ==) in game.GuestManager.guestMain(User, Print)
 - No relationship between generic parameter and method argument (1)
 - Integer is incompatible with expected argument type String in game.TributeWarManager.getRegionMap()
- Scary (24)
 - High confidence (4)
 - Normal confidence (20)
- Troubling (65)
 - High confidence (12)
 - Normal confidence (53)
- Of Concern (173)
 - High confidence (173)

Static Analysis(checkstyle)

checkstyle 화면 : 검토가 필요한 코드 스타일 목록들을 표시하고, 그 비중을 시각화해 보여준다.

Fall through from previous branch of the switch statement.	7
Wrong lexicographical order for 'X' import. Should be before 'X'.	1463
'X' should be separated from previous statement.	3302
Using the '*' form of import should be avoided - X.	6
Line is longer than X characters (found X).	23065
Empty catch block.	13
Each variable declaration must be in its own statement.	34
'X' at column X should be alone on a line.	180
'X' construct must use '()'s.	1879
'X' is preceded with whitespace.	12273
<p> tag should be preceded with an empty line.	12
'X' has incorrect indentation level X, expected level should be X.	68524
Top-level class X has to reside in its own source file.	1
'X' at column X should be on the previous line.	278
'X' child has incorrect indentation level X, expected level should be o...	1478
Unused X tag for 'X'.	1
Abbreviation in name 'X' must contain no more than 'X' consecutive ...	1667
Array brackets at illegal position.	492
All overloaded methods should be placed next to each other. Placing ...	75
'X' modifier out of order with the JLS suggestions.	87
'X' should be on a new line.	368
Summary javadoc is missing.	9
Comment has incorrect indentation level X, expected is X, inden...	173
Javadoc comment is placed in the wrong location.	1
Name 'X' must match pattern 'X'.	2950
'X' is not preceded with whitespace.	5402
Empty X block.	13
'typecast' is not followed by whitespace.	1928
'X' at column X should have line break after.	194
Distance between variable 'X' declaration and its first usage is X, but a...	841
At-clause should have a non-empty description.	11
Line continuation have incorrect indentation level, expected level sho...	6
Only one statement per line allowed.	450
'X' child has incorrect indentation level X, expected level should be X.	81110
Empty line should be followed by <p> tag on the next line.	1
'X' is followed by whitespace.	9977
'X' at column X should be on the same line as the next part of a mult...	1871
'X' is not followed by whitespace.	27982
Block comment has incorrect indentation level X, expected is X, inden...	7
'X' is followed by an illegal character.	89
Javadoc tag 'X' should be preceded with an empty line.	37
Line contains a tab character.	191757
'X' has incorrect indentation level X, expected level should be one of t...	558
'X' should be on the previous line.	17
Extra separation in import group before 'X'	890

각 코드 스타일 빈도 시각화



Static Analysis(pmd)

pmd - Violations Overview : 각 소스 코드의 위험도가 어느 정도인지 확인할 수 있다.

The screenshot shows the 'Violations Overview' window in an IDE. The window title bar includes 'History', 'Debug', 'Bug Explorer', 'Checkstyle violations', 'CPD View', 'Dataflow View', 'Violations Outline', 'Violations Overview', and 'XPath Designer'. The main content is a table with the following data:

Element	# Violations	# Violations/KLOC	# Violations/Method	Project
controller	8171	425.4	11.01	
_controller.java	31	574.1	10.33	
LocalVariableCouldBeFinal	9	166.7	3.00	
LoggerIsNotStaticFinal	1	18.5	0.33	
MethodArgumentCouldBeFinal	6	111.1	2.00	
BeanMembersShouldSerialize	1	18.5	0.33	
AtLeastOneConstructor	1	18.5	0.33	
ImmutableField	1	18.5	0.33	
SignatureDeclareThrowsException	3	55.6	1.00	
DataflowAnomalyAnalysis	6	111.1	2.00	
CloseResource	3	55.6	1.00	

Static Analysis(pmd)

pmd - Violations Outline : 각 코드(한 줄)의 에러 위험도를 나타내준다.



P	Line	created	Rule	Error Message
▶	582	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	980	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	610	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	187	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	589	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	557	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	563	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	605	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	560	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	615	Wed Apr 28 22:41:...	AvoidUsingShortType	AvoidUsingShortType: Do not use the short type
▶	55	Wed Apr 28 22:41:...	AvoidReassigningParameters	AvoidReassigningParameters: Avoid reassigning parameters such as 'server'
▶	82	Wed Apr 28 22:41:...	AvoidReassigningParameters	AvoidReassigningParameters: Avoid reassigning parameters such as 'channel'
▶	958	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like CB_STRATEGIC_VALUE
▶	1451	Wed Apr 28 22:41:...	MethodArgumentCouldBeFinal	MethodArgumentCouldBeFinal: Parameter 'endACount' is not assigned and could be declared final
▶	689	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like CASTLE_QUEST_EXPLORE
▶	1011	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like KING_EVENT_STEP_SIPOINT2
▶	84	Wed Apr 28 22:41:...	LocalVariableCouldBeFinal	LocalVariableCouldBeFinal: Local variable 's' could be declared final
▶	1959	Wed Apr 28 22:41:...	MethodArgumentCouldBeFinal	MethodArgumentCouldBeFinal: Parameter 'userSeq' is not assigned and could be declared final
▶	650	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like GUILD_SACK_LOSE_USER_COUNT
▶	651	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like GUILD_SACK_HISTORY_SACK
▶	1955	Wed Apr 28 22:41:...	MethodArgumentCouldBeFinal	MethodArgumentCouldBeFinal: Parameter 'text2' is not assigned and could be declared final
▶	583	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like EVENT_SORT_ITEM_BOX
▶	837	Wed Apr 28 22:41:...	MethodArgumentCouldBeFinal	MethodArgumentCouldBeFinal: Parameter 'resource_idx' is not assigned and could be declared final
▶	1046	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like BATTLE_FREE_PROGRESS_TIME
▶	1573	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like PASSION_ARMY_ABIL_DAMAGE
▶	1039	Wed Apr 28 22:41:...	LongVariable	LongVariable: Avoid excessively long variable names like GUILD_RAID_BOARD_OFFSET

Static Analysis(pmd)



pmd - Dataflow View : 한 메소드 내에서의 데이터 흐름이 어떻게 이루어지고 있는지 확인할 수 있다.

Method: `getServerName(String) : String`

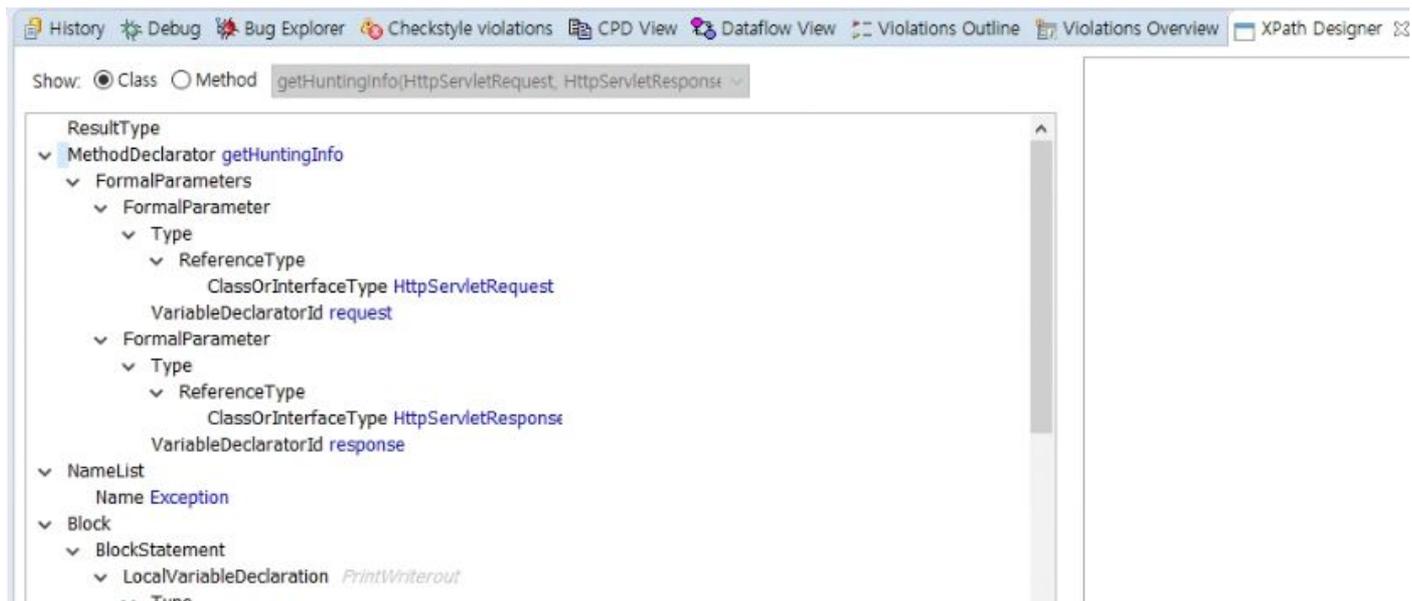
Line	Graph	Next nodes	Dataflow types	Codeline
1491		1		
1491		2		
1492		3, 4		
1494		5		
1497		5		
1499				

회사 코드
(보안상 숨김)

Static Analysis(pmd)



pmd - Xpath Designer : 계층 구조로 각 클래스가 어떻게 위치해 있는지 알 수 있다.



3.

Unit Test

Unit Test



Java Projects - 지리찾기 (2020)/src/Test/FrameGameTest.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer JUnit

Finished after 0.81 seconds

Runs: 1/1 Errors: 0 Failures: 0

FrameGameTest [Runner: JUnit 5] (0.30 s)
testFrameGame() (0.306 s)

```
1 package Test;
2
3 import org.junit.jupiter.api.Assertions;
4
5
6
7
8 class FrameGameTest {
9
10     @Test
11     void testFrameGame() {
12         FrameGame frame = new FrameGame();
13         Assertions.assertEquals(frame.getWidth(), 800);
14     }
15 }
16
17
18
```

4.

System Test

System Testing

< Traceability Table >

System Function	하위 요구사항	Use Case	Operation	Method	Unit Test
...
...
...
...

client requirement - spec - implementation code - test code



Review

↑
Dynamic Testing
(Brute Force)

5.

소프트웨어 V&V

코드 검증 과정



Google
Cloud Platform

 eclipse

1. 코드 업로드

 ↔ 

3학년

2. 원격 빌드

 Jenkins

 CentOS

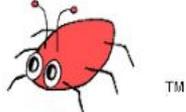
 <APACHE ANT>

3. 빌드 리포트 확인 및 수동 버그 확인

 4학년

 eclipse

 JUnit

 FindBugs

 Pmd
DON'T SHOOT THE MESSENGER

 checkstyle

커뮤니케이션 과정

- 피드백 과정

