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SER 316 – Assignment 4

Git

When we merge StaticAnalysis to Whitebox, nothing special should happen. In my opinion the deleted file will get restored in Whitebox. There should not be any conflicts or issues

GitHub Actions

Main, Blackbox, Review branches fail GitHub actions. The primary reason that all these branches fail is because GamePlay class is not implemented for the Whitebox test.

Task 1: Checkstyle

CheckStyle Audit

Designed for use with [CheckStyle](#) and [Ant](#).

Summary	
Files	Errors
10	111

Files	
Name	Errors
D:\Git\ser316-spring2023B-ehakobya\src\main\java\GamePlay.java	82
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Character.java	15
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Main.java	8
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Barbarian.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Bard.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Druid.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Ranger.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Rogue.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Wizard.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\GamePlayInterface.java	0

File D:\Git\ser316-spring2023B-ehakobya\src\main\java\Barbarian.java	
Error Description	Line
Missing a Javadoc comment.	3
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File D:\Git\ser316-spring2023B-ehakobya\src\main\java\Bard.java	
Error Description	Line
Missing a Javadoc comment.	3
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File D:\Git\ser316-spring2023B-ehakobya\src\main\java\Character.java	
Error Description	Line
WhitespaceAround: ';' is not preceded with whitespace.	2
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	2
WhitespaceAround: ';' is not preceded with whitespace.	3
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	3
WhitespaceAround: ';' is not preceded with whitespace.	4
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	4
WhitespaceAround: ';' is not preceded with whitespace.	5
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	5
WhitespaceAround: ';' is not preceded with whitespace.	6
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	6
WhitespaceAround: ';' is not preceded with whitespace.	7
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	7
WhitespaceAround: ';' is not preceded with whitespace.	8
WhitespaceAround: ';' is not followed by whitespace. Empty blocks may only be represented as {} when not part of a multi-block statement (4.1.3)	8
Missing a Javadoc comment.	10
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File D:\Git\ser316-spring2023B-ehakobya\src\main\java\Druid.java	
Error Description	Line
Missing a Javadoc comment.	3
Back to top	

File D:\Git\ser316-spring2023B-ehakobya\src\main\java\GamePlay.java	
Error Description	Line
Using the '.' form of import should be avoided - java.util.*.	1
Member name 'Opponents' must match pattern '[a-z][a-z0-9][a-zA-Z0-9]*\$'.	6
'if' construct must use '{}'	53
'else' construct must use '{}'	54
'if' construct must use '{}'	65
'else' construct must use '{}'	67
Line is longer than 100 characters (found 118).	72
Line is longer than 100 characters (found 123).	73
Line is longer than 100 characters (found 118).	94
Line is longer than 100 characters (found 132).	96
Empty line should be followed by <p> tag on the next line.	98
Line is longer than 100 characters (found 158).	99
Empty line should be followed by <p> tag on the next line.	102
Empty line should be followed by <p> tag on the next line.	104

CheckStyle Audit

Designed for use with [CheckStyle](#) and [Ant](#).

Summary	
Files	Errors
3	40

Files	
Name	Errors
D:\Git\ser316-spring2023B-ehakobya\src\test\java\BlackBoxGiven.java	20
D:\Git\ser316-spring2023B-ehakobya\src\test\java\TDD.java	12
D:\Git\ser316-spring2023B-ehakobya\src\test\java\WhiteBoxGiven.java	8

File D:\Git\ser316-spring2023B-ehakobya\src\test\java\BlackBoxGiven.java	
Error Description	Line
Wrong lexicographical order for 'java.lang.reflect.Constructor' import. Should be before 'org.junit.runners.Parameterized'.	5
Wrong lexicographical order for 'java.util.Arrays' import. Should be before 'org.junit.runners.Parameterized'.	6
Wrong lexicographical order for 'java.util.Collection' import. Should be before 'org.junit.runners.Parameterized'.	7
Import statement for 'org.junit.Assert.' is in the wrong order. Should be in the 'STATIC' group, expecting not assigned imports on this line.	9
Using the '.' form of import should be avoided - org.junit.Assert.*.	9
Missing a Javadoc comment.	22
'(' is followed by whitespace.	64
'(' is followed by whitespace.	71
'(' is followed by whitespace.	78
Line is longer than 100 characters (found 104).	96
'(' is followed by whitespace.	102
'(' is followed by whitespace.	109
'(' is followed by whitespace.	116
'(' is followed by whitespace.	123
'(' is followed by whitespace.	138
'(' is followed by whitespace.	145
'(' is followed by whitespace.	152
Comment has incorrect indentation level 0, expected is 8, indentation should be the same level as line 207.	206
Line is longer than 100 characters (found 115).	293
'method def modifier' has incorrect indentation level 8, expected level should be 4.	313

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File D:\Git\ser316-spring2023B-ehakobya\src\test\java\TDD.java	
Error Description	Line
'import' should be separated from previous statement.	9
Import statement for 'org.junit.Assert.assertEquals' is in the wrong order. Should be in the 'STATIC' group, expecting not assigned imports on this line.	9
Abbreviation in name 'TDD' must contain no more than '2' consecutive capital letters.	15
First sentence of Javadoc is missing an ending period.	24
First sentence of Javadoc is missing an ending period.	70
First sentence of Javadoc is missing an ending period.	112
First sentence of Javadoc is missing an ending period.	147
First sentence of Javadoc is missing an ending period.	186
First sentence of Javadoc is missing an ending period.	218
First sentence of Javadoc is missing an ending period.	237
First sentence of Javadoc is missing an ending period.	255
First sentence of Javadoc is missing an ending period.	279

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File D:\Git\ser316-spring2023B-ehakobya\src\test\java\WhiteBoxGiven.java	
Error Description	Line
Import statement for 'org.junit.Assert.' is in the wrong order. Should be in the 'STATIC' group, expecting not assigned imports on this line.	5
Using the '.' form of import should be avoided - org.junit.Assert.*.	5
First sentence of Javadoc is missing an ending period.	18
Abbreviation in name 'equalDP' must contain no more than '2' consecutive capital letters.	26
WhitespaceAround: '{' is not preceded with whitespace.	96
WhitespaceAround: '{' is not preceded with whitespace.	124
WhitespaceAround: '{' is not preceded with whitespace.	144
Distance between variable 'c4' declaration and its first usage is 4, but allowed 3. Consider making that variable final if you still need to store its value in advance (before method calls that might have side effects on the original value).	167

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Q5:

In main checkstyle found **111 errors in main**, and **40 errors in test**.

Q7:

Number of violations did not change. IntelliJ was already configured not use tabs (“use tab character” toggle was already turned off in Settings -> Editor -> Code Style -> Java)

Also, applying conversion to spaces (From Edit-> Convert Indents -> To Spaces) results in a message “All lines already have requested indentation” for every java file.

Q9:

Main

Summary	
Files	Errors
10	10

Files	
Name	Errors
D:\Git\ser316-spring2023B-ehakobya\src\main\java\GamePlay.java	2
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Barbarian.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Bard.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Character.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Druid.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Main.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Ranger.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Rogue.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\Wizard.java	1
D:\Git\ser316-spring2023B-ehakobya\src\main\java\GamePlayInterface.java	0

Test

Summary	
Files	Errors
3	7

Files	
Name	Errors
D:\Git\ser316-spring2023B-ehakobya\src\test\java\BlackBoxGiven.java	3
D:\Git\ser316-spring2023B-ehakobya\src\test\java\WhiteBoxGiven.java	3
D:\Git\ser316-spring2023B-ehakobya\src\test\java\TDD.java	1

Q10:

The screenshot shows an IDE window for a project named "ser316-spring2023B-ehakobya". The main editor displays the content of "main.html", which is an HTML document with a head section containing a meta tag and a style tag, and a body section with a table structure. The table has a header row with "th" and "td" elements, and a body row with "table", "th", and "td" elements. The table is styled with a border, font size, and background color. The terminal window at the bottom shows the output of a "gradle build" command, indicating a successful build.

```
<html>
<head>
  <META http-equiv="Content-Type" content="text/html; charset=UTF-8">
  <style type="text/css">
    .bannercell {
      border: 0px;
      padding: 0px;
    }
    body {
      margin-left: 10;
      margin-right: 10;
      font:normal 80% arial,helvetica,sanserif;
      background-color:#FFFFFF;
      color:#000000;
    }
    .a td {
      background: #efefef;
    }
    .b td {
      background: #fff;
    }
    th, td {
      text-align: left;
      vertical-align: top;
    }
    th {
      font-weight:bold;
      background: #ccc;
      color: black;
    }
    table, th, td {
      font-size:100%;
      border: none
    }
  </style>
</head>
<body>
  <table border="1">
    <tr>
      <th>
        <td>
      </tr>
    </table>
  </body>
</html>
```

Terminal Local (2) x

```
PS D:\Git\ser316-spring2023B-ehakobya> gradle build
Starting a Gradle Daemon, 1 incompatible and 2 stopped Daemons could not be reused, use --status for details

Deprecated Gradle features were used in this build, making it incompatible with Gradle 8.0.

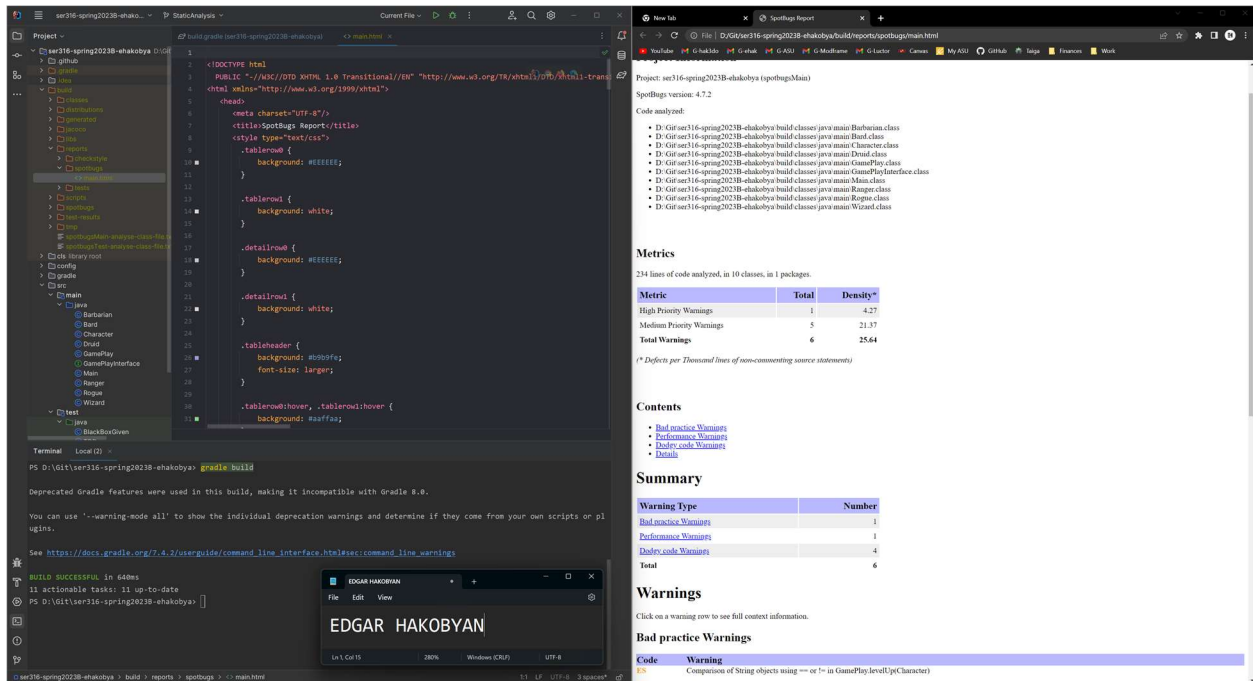
You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

See https://docs.gradle.org/7.4.2/userguide/command\_line\_interface.html#sec:command\_line\_warnings

BUILD SUCCESSFUL in 4s
9 actionable tasks: 2 executed, 7 up-to-date
PS D:\Git\ser316-spring2023B-ehakobya>
```

Task2: Spotbugs

2.1



The screenshot displays an IDE with a SpotBugs report open. The report shows the following metrics:

Metric	Total	Density*
High Priority Warnings	1	4.27
Medium Priority Warnings	5	21.37
Total Warnings	6	25.64

* Defects per Thousand lines of non-commenting source statements

The report also includes a summary table:

Warning Type	Number
Bad practice Warnings	1
Performance Warnings	1
Debug code Warnings	4
Total	6

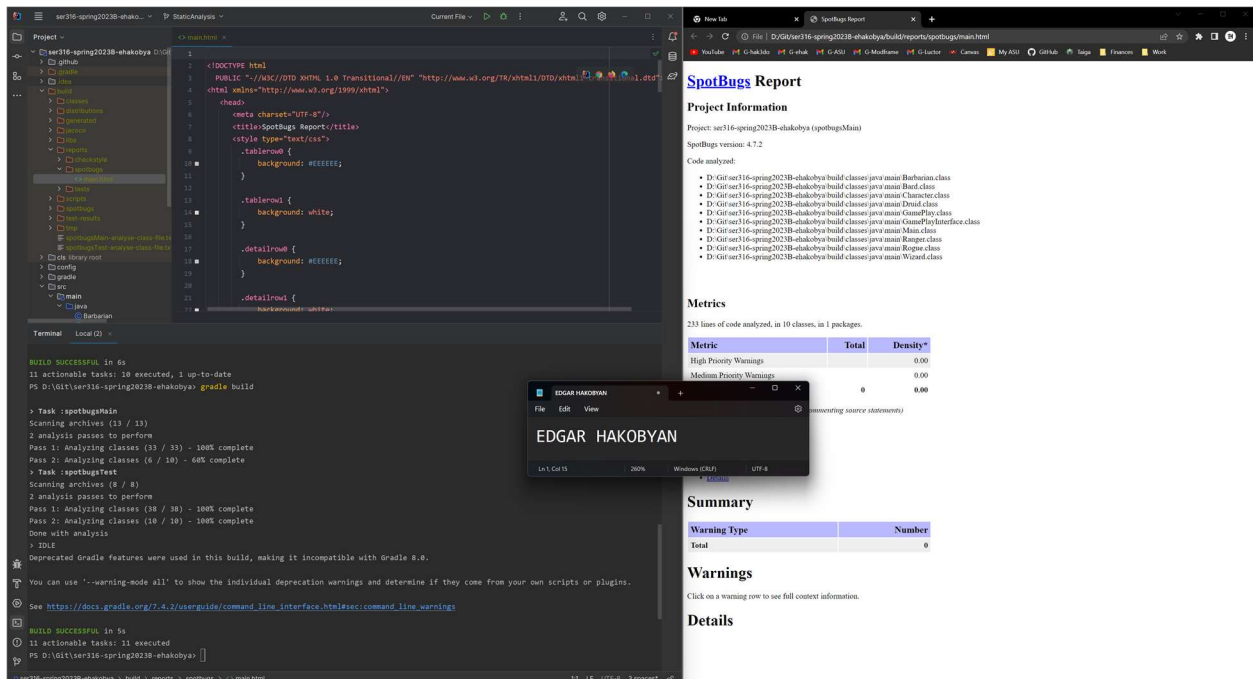
The warnings are categorized as:

- Bad practice Warnings
- Performance Warnings
- Debug code Warnings

The report also includes a list of warnings, with the first one being:

- Code Warning: Comparison of String objects using == or != in GamePlayLevel3pCharacter

2.2



The screenshot displays an IDE with a SpotBugs report open. The report shows the following metrics:

Metric	Total	Density*
High Priority Warnings	0	0.00
Medium Priority Warnings	0	0.00
Total Warnings	0	0.00

* Defects per Thousand lines of non-commenting source statements

The report also includes a summary table:

Warning Type	Number
Total	0

The warnings are categorized as:

- Bad practice Warnings
- Performance Warnings
- Debug code Warnings

The report also includes a list of warnings, with the first one being:

- Code Warning: Comparison of String objects using == or != in GamePlayLevel3pCharacter

Task 3: Comparing

Comparison of initial checkstyle and spotbug reports

Branch	Checkstyle		Spotbugs
	Main	Test	
StaticAnalysis	111	40	6
Blackbox	111	23	4
Review	111	23	7

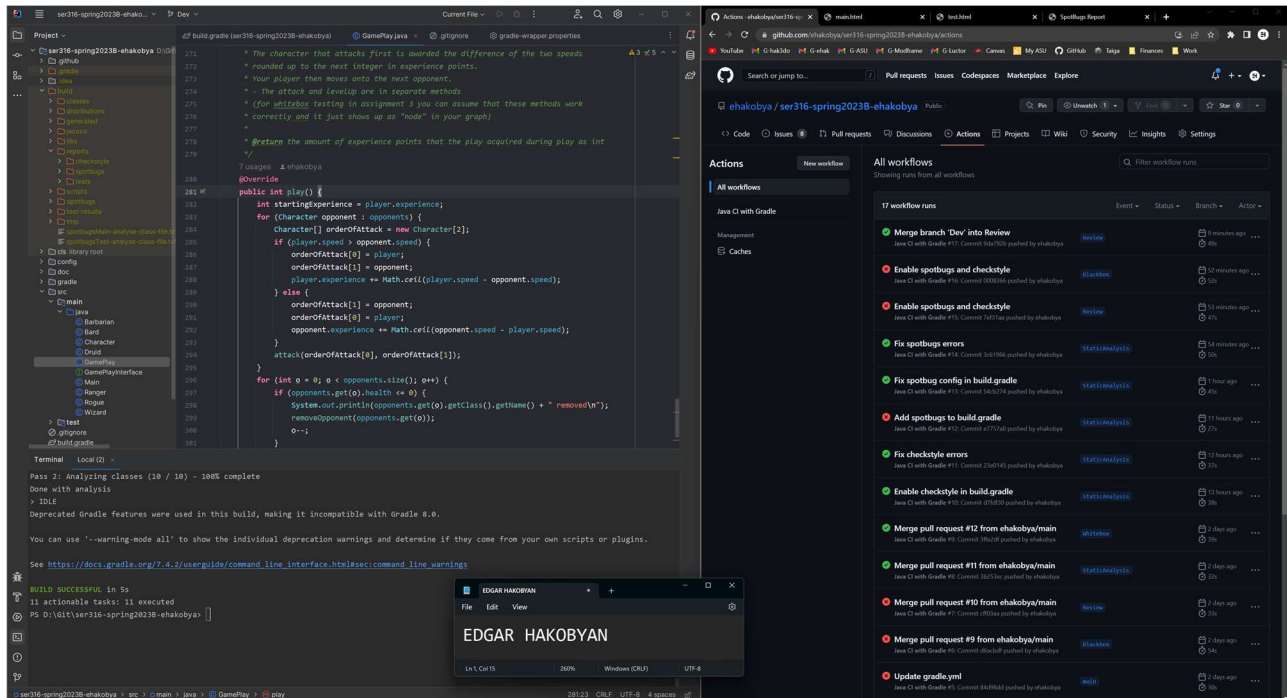
After StaticAnalysis fixes

Branch	Checkstyle		Spotbugs
	Main	Test	
StaticAnalysis	10	7	0

Reports clearly show improvement for StaticAnalysis before and after the fixes. Number of errors was reduced by at least 10 times. The only errors that were left were the JavaDoc comments.

Task 4

The report from ser316-spring2023B-ehakobya got a little worse but not by a lot. Only 7 more checkstyle issues in main and 0 more issues in Test. Spotbugs still shows 0 errors. Most of the changes that happened were in the whitebox branch (implementations) and corrections to bugs and checkstyles were done in StaticAnalysis. But static analysis was branched off whitebox. Therefore it contained the implementations in it, and we reduced and fixed errors on this branch. Therefore, it seems logical that after merging all branches, dev would still have the best version of the code from staticanalysis.



I would fix first spotbugs errors since errors leading to potential bugs are more important than stylistic changes. Then I would apply checkstyle fixes.

Task 5: Final code review

No changes necessary