CES - 2021

DetektDx: A Convertor from Detekt Output to Valid Dx-Platform Input Analyzing Detekt, kotlinx.coroutines

Bogdan-Călin Bogorodea

Case Study

Detekt is a static code analysis tool for the Kotlin programming language. It operates on the abstract syntax tree provided by the Kotlin compiler and can detect and report information such as information on complexity based on code smells, cyclomatic complexity, and number of lines of code.

kotlin.coroutines is a library multiplatform support for Kotlin coroutines.

Detekt

1100+ files

150+ contributors

3500+ commits

4 years

kotlinx.coroutines

900+ files

170+ contributors

2200+ commits

4 years

Steps:

1. Detekt Output
2. DetektDx
3. DetektDx Ouput for Detekt
4. Importing Detekt DetektDx Output in Dx-Platform
5. System Map for Detekt
6. DetektDx Output for kotlinx.coroutines
7. Importing kotlinx.couroutines DetektDx Output in Dx-Platform
8. System Map for kotlinx.couroutines

1. Detekt Output

1. Detekt Output

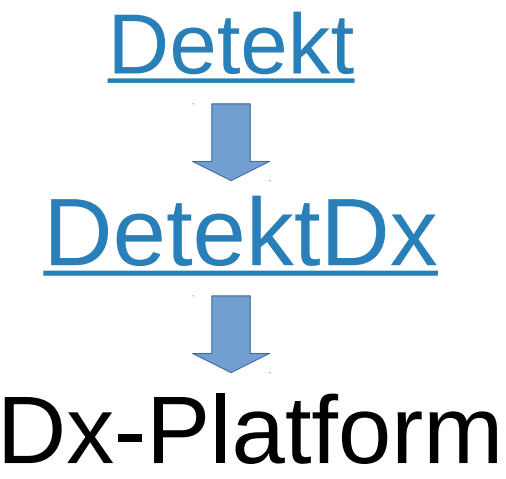
Below is a screenshot that captures a part of the .txt report generated by Detekt for a Kotlin project. This report was opened in Atom. It can be seen in it that some lines have a part x/y, e.g. 103/60, 82/60, and some don't. In spite of such differences, the DetektDx generates .json that can be understood by Dx-Platform.

```
NestedBlockDepth - 4/4 - [rehash] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutin
TooManyFunctions - 31/11 - [DebugProbesImpl] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotli
NestedBlockDepth - 4/4 - [run] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/
TooManyFunctions - 17/11 - [TestCoroutineContext] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/
TooManyFunctions - 16/11 - [StackTraceRecovery.kt] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format
ComplexMethod - 15/15 - [prepare] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutin
NestedBlockDepth - 4/4 - [prepare] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.corouti
NestedBlockDepth - 4/4 - [correctPrev] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.cor
TooManyFunctions - 23/11 - [LockFreeLinkedListNode] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_forma
TooManyFunctions - 28/11 - [CoroutineScheduler] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/ko
TooManyFunctions - 17/11 - [Worker] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.corout
TooManyFunctions - 11/11 - [ExperimentalCoroutineDispatcher] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_in
ComplexMethod - 15/15 - [testStress] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.corou
LongMethod - 64/60 - [check] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/ko
different outer contexts private inline fun check(crossinline block: suspend () -> Unit)
NestedBlockDepth - 4/4 - [shutdownDispatcherPools] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format
LongMethod - 61/60 - [testStressClose] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.cor
LongMethod - 72/60 - [testStress] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutin
LongMethod - 67/60 - [testStress] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutin
LongMethod - 72/60 - [testStress] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutin
ComplexMethod - 25/15 - [testStress] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.corou
TooManyFunctions - 14/11 - [CoroutinesBlockHoundIntegration] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_in
NestedBlockDepth - 4/4 - [checkForAtomicFu] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlin
LongMethod - 94/60 - [play] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/ben
LongMethod - 82/60 - [play] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/ben
LongMethod - 103/60 - [play] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/be
EmptyFunctionBlock - [required_spec309_requestZeroMustSignalIllegalArgumentException] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput
EmptyFunctionBlock - [required_spec309_requestNegativeNumberMustSignalIllegalArgumentException] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_de
EmptyFunctionBlock - [cancel] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/r
EmptyFunctionBlock - [cancel] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/r
EmptyFunctionBlock - [required_spec309_requestZeroMustSignalIllegalArgumentException] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput
EmptyFunctionBlock - [required_spec309_requestNegativeNumberMustSignalIllegalArgumentException] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_de
EmptyFunctionBlock - [onError] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/
EmptyFunctionBlock - [onError] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/
EmptyFunctionBlock - [onError] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/
EmptyFunctionBlock - [onError] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput_format_to_dx-platform_input_format/kotlinx.coroutines/
EmptyFunctionBlock - [required_spec309_requestZeroMustSignalIllegalArgumentException] at /home/username/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_detekt_ouput
```

2. DetektDx

DetektDx

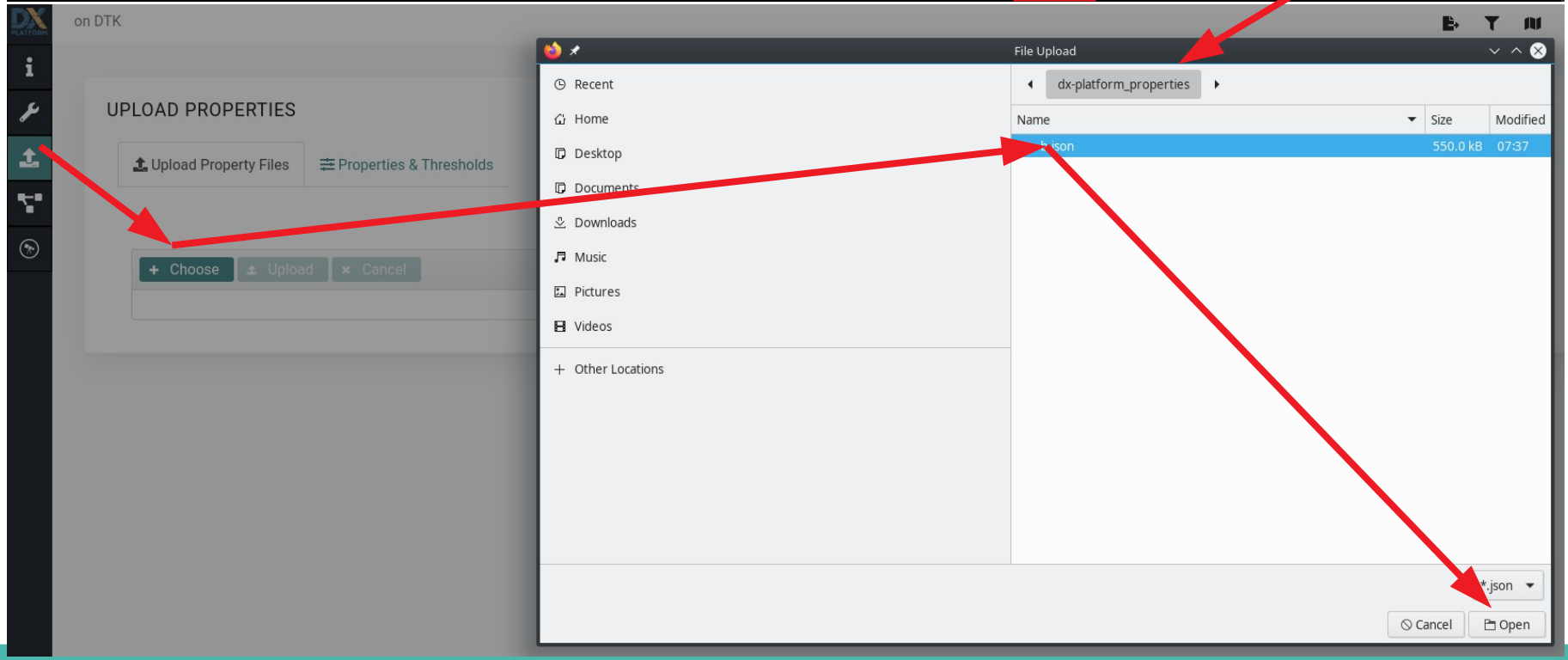
DetektDx is a project able convert the output of Detekt static analysis to data that is understandable by Dx-Platform. That helps Dx-Platform display more and likely useful information for Kotlin projects. That is particularly useful when you have a Kotlin project, but you want more than each of Dx-Platform and Detekt can offer separately.



DetektDx - Configuration

DetektDx generates a .json file at the given path that can be uploaded to Dx-Platform. Below, as example, the Docker command is executed for analyzing with detektDx the detekt Kotlin project. For other Kotlin projects it is sufficient to change appropriately what is in underlined with red. The output is generated in the directory /dx-platform_properties. The three linked arrows show the steps and the left arrow shows that the a part of the command “$PWD/dx-platform_properties caused the b.json to be written at this path.

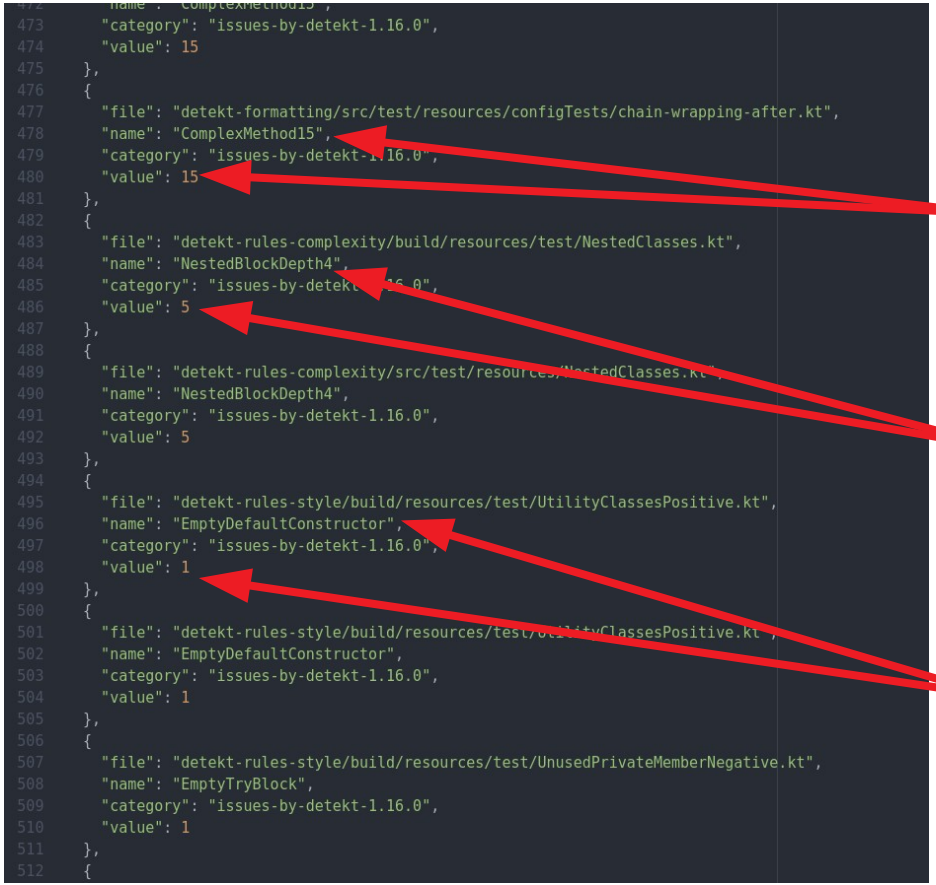
```
username@username-VivoBook-ASUSLaptop-X509FJ-X509FJ:~/Desktop/upt/2020-2021/sem2/waiting/ces/proiect_de_predat/partial_converter_for_
detekt_ouput_format_to_dx-platform_input_format$ sudo docker run -v $PWD/detekt:/detektDx/detekt -v $PWD/dx-platform_properties:/dete
ktDx/dx-platform_properties b12koe1/bogdanbc-ces-repository bash -c "kotlin DetektDxKt detekt"
```



3. DetektDx Output for Detekt

3. DetektDx Output for Detekt

Below is a screenshot that captures a part of the b.json file generated for the Detekt project. b.json was opened in Atom.



```
473      "category": "issues-by-detekt-1.16.0",
474      "value": 15
475    },
476    {
477      "file": "detekt-formatting/src/test/resources/configTests/chain-wrapping-after.kt",
478      "name": "ComplexMethod15",
479      "category": "issues-by-detekt-1.16.0",
480      "value": 15
481    },
482    {
483      "file": "detekt-rules-complexity/build/resources/test/NestedClasses.kt",
484      "name": "NestedBlockDepth4",
485      "category": "issues-by-detekt-1.16.0",
486      "value": 5
487    },
488    {
489      "file": "detekt-rules-complexity/src/test/resources/NestedClasses.kt",
490      "name": "NestedBlockDepth4",
491      "category": "issues-by-detekt-1.16.0",
492      "value": 5
493    },
494    {
495      "file": "detekt-rules-style/build/resources/test/UtilityClassesPositive.kt",
496      "name": "EmptyDefaultConstructor",
497      "category": "issues-by-detekt-1.16.0",
498      "value": 1
499    },
500    {
501      "file": "detekt-rules-style/build/resources/test/UtilityClassesPositive.kt",
502      "name": "EmptyDefaultConstructor",
503      "category": "issues-by-detekt-1.16.0",
504      "value": 1
505    },
506    {
507      "file": "detekt-rules-style/build/resources/test/UnusedPrivateMemberNegative.kt",
508      "name": "EmptyTryBlock",
509      "category": "issues-by-detekt-1.16.0",
510      "value": 1
511    },
512    {
```

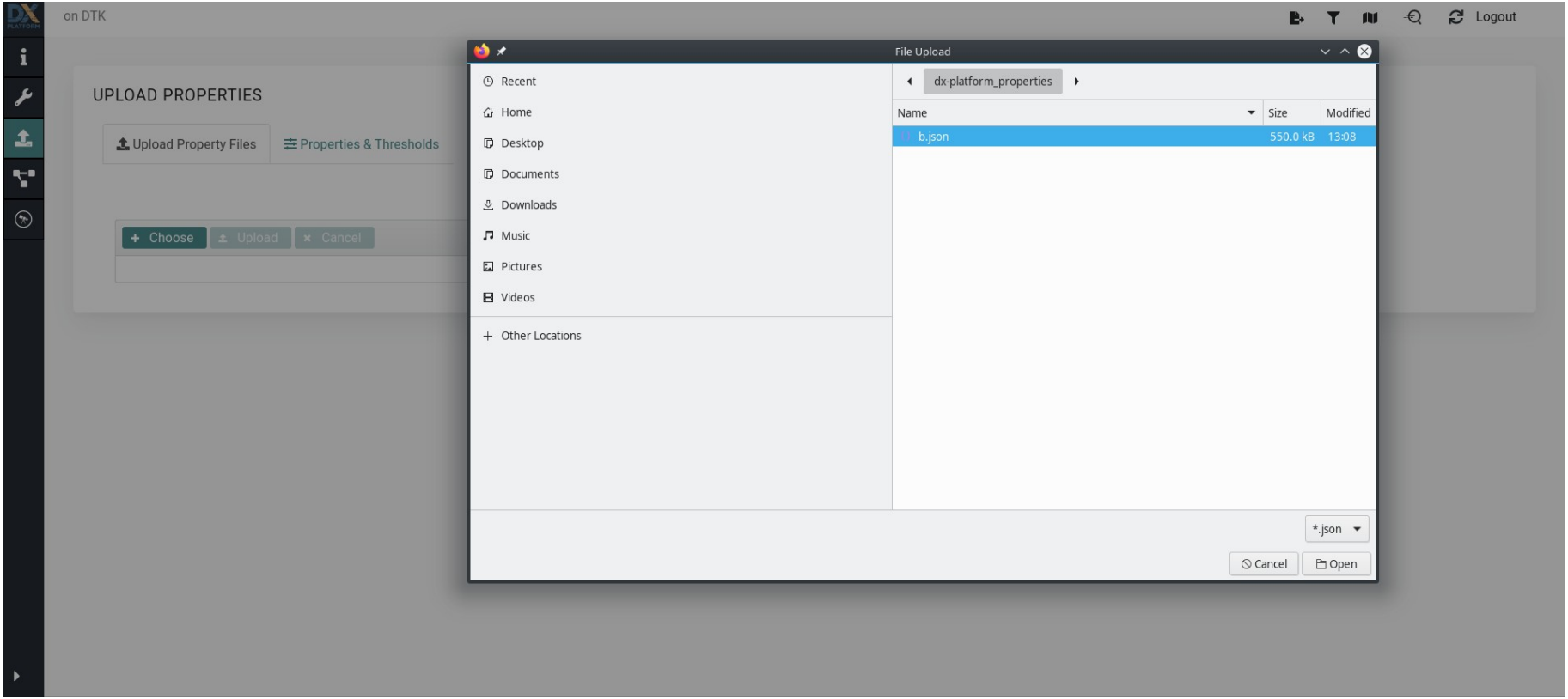
If the property name of the property **has** a value appended to it, then this value is greater or equal with with the value of the number appended to the name. These two numbers have a meaning, depending on the detected issue, e.g. Method Complexity, Depth of Nested Blocks. Examples in the capture:
Example 1: see lines 478 and 480 (also pointed with the red arrows):
ComplexMethod15 => the number appended to the name is 15. The value is also 15, so the value is greater or equal to the number appended to name. These values represent the Complexity of Method found in the file located at the path from the line 477.

Example 2: see lines 484 and 486 (also pointed with the red arrows)
NestedBlockDepth4 => the number appended to the name is 4. The value is also 5, so the value is greater or equal to the number appended to name. These values represent the Depth of a Nested Block in the file located at the path from the line 483.

If the property name **does not have** a value appended to it, the value key of the property is 1 by default. As example, see the lines pointed by the red arrows, i.e. the lines 496 and 498.

4. Importing Detekt DetektDx Output in Dx-Platform

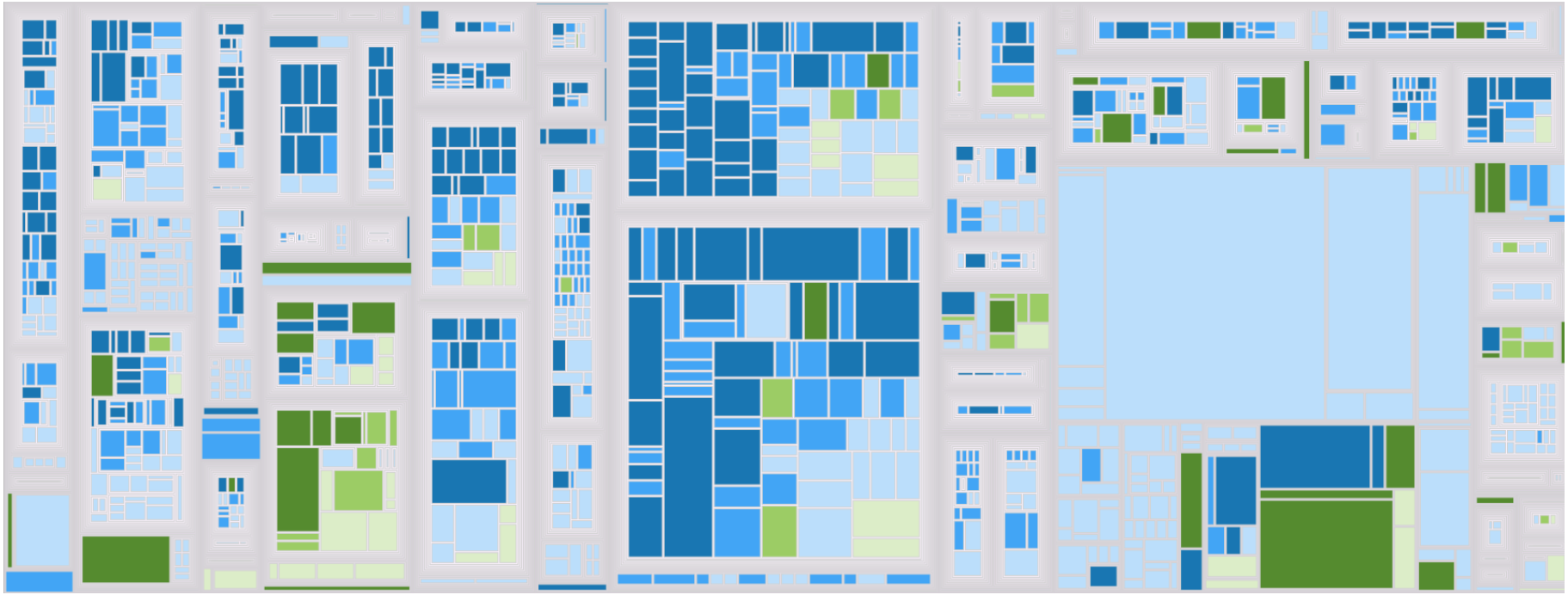
4. Importing Detekt DetektDx Output in Dx-Platform



5. System Map for Detekt

5. System Map for Detekt

5. System Map for Detekt



6. DetektDx Output for kotlinx.coroutines

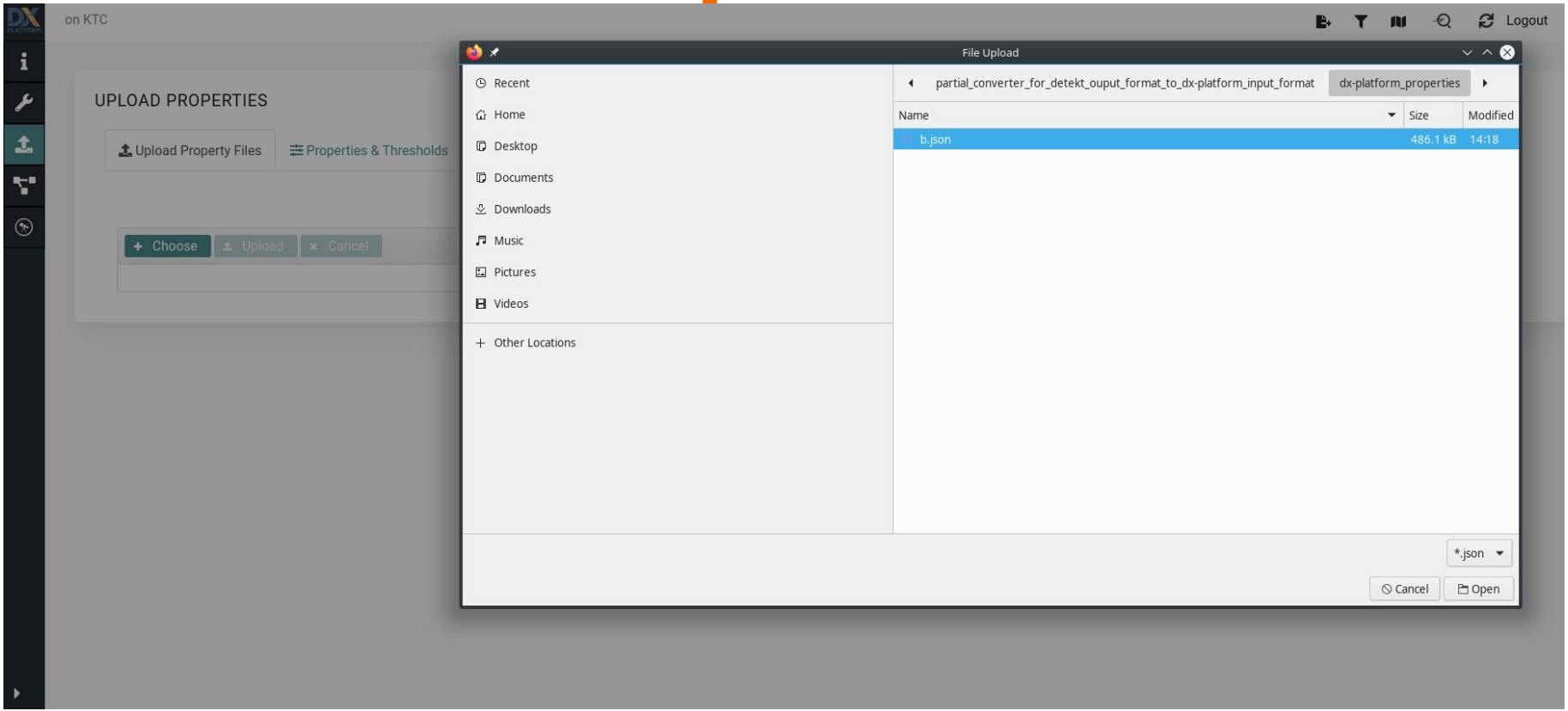
6. DetektDx Output for kotlinx.coroutines

Below is a screenshot that captures a part of the b.json file generated for the kotlinx.coroutines project. b.json was opened in Atom.


```
494   {
495     "file": "benchmarks/src/jmh/kotlin/benchmarks/flow/scrabble/FlowPlaysScrabbleBase.kt",
496     "name": "LongMethod60",
497     "category": "issues-by-detekt-1.16.0",
498     "value": 94
499   },
500   {
501     "file": "benchmarks/src/jmh/kotlin/benchmarks/flow/scrabble/FlowPlaysScrabbleOpt.kt",
502     "name": "LongMethod60",
503     "category": "issues-by-detekt-1.16.0",
504     "value": 82
505   },
506   {
507     "file": "benchmarks/src/jmh/kotlin/benchmarks/flow/scrabble/ReactorPlaysScrabble.kt",
508     "name": "LongMethod60",
509     "category": "issues-by-detekt-1.16.0",
510     "value": 103
511   },
512   {
513     "file": "reactive/kotlinx-coroutines-reactive/test/RangePublisherBufferedTest.kt",
514     "name": "EmptyFunctionBlock",
515     "category": "issues-by-detekt-1.16.0",
516     "value": 1
517   },
518   {
519     "file": "reactive/kotlinx-coroutines-reactive/test/RangePublisherBufferedTest.kt",
520     "name": "EmptyFunctionBlock",
521     "category": "issues-by-detekt-1.16.0",
522     "value": 1
523   },
524   {
525     "file": "reactive/kotlinx-coroutines-reactive/test/PublisherAsFlowTest.kt",
526     "name": "EmptyFunctionBlock",
527     "category": "issues-by-detekt-1.16.0",
528     "value": 1
529   },
530   {
```

7. Importing kotlinx.coroutines DetektDx Output in Dx-Platform

7. Importing kotlinx.coroutines DetektDx Output in Dx-Platform



8. System Map for kotlinx.coroutines

8. System Map for kotlinx.coroutines

8. System Map for kotlinx.coroutines