First Concept

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Course:
Context Project (TI - 2806)

TUDelft

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1. What programming language are we analyzing?

The programming language we are going to analyzing is Java, since we want to build our product to analyze the language that is most common and influential. According to TIOBE Programming Community index, an indicator of the popularity of programming language [1].

The number #1 programming language on the list is Java, with ratings of 20.846% in April 2016. And also looking at PYPL PopularitY index, an indicator of how often language tutorial are searched on Google [2]. The number #1 programming language is also Java, with share of 24.0%. Furthermore, we also discussed in the team, the programming language background we all have in common is Java, choosing Java will enable us to work closely together.

2. Which language will we write the analyzer in?

As we discussed in the previous section, we all share common background knowledge in Java, and three of our teammates have taken Big Data Processing and Data Mining courseswhere we had some practice on how to analyze data in Java. Therefore, we think we should write our analyzer in Java, so we do not spend too much time on learning a new programming language and implement as many functionalities as we can with the programming language that we are already familiar with.

3. Which language will we write the visualizer in?

After the first meeting with our client, Moritz Beller has suggested that we should build our visualization with a well-developed library, and he mentioned that JavaScript is a good language for visualization. So we have done some research on what are the good visualization libraries. Our team is separated into two sub-team, analyzer team and visualizer team. They analyzer team have discussed with visualizer team, which language do they prefer to use, and the visualizer team have decided that JavaScript is the language to use. And we found following tools for visualization in JavaScript:

https://d3js.org/
http://fellinlovewithdata.com/guides/data-vis-beginners-toolkit-2
http://www.fastcompany.com/3029760/the-five-best-libraries-for-building-data-vizualizations
http://www.sitepoint.com/twelve-javascript-libraries-data-visualization/

4. What are the main features of our system?

The main features of our system would include the following:
- Our system is able to analyze the project of our users through different static analysis tool.
- Our system is able to produce a visualization of the results which are produced from SAT.
- Our system is able to generate different kinds of visualizations, e.g. warnings from different SATs, the class hierarchy of the user's project.
- Our system is able group warnings from the same component or group warnings that are same kind even generated by different SATs.
- Our System is able to let user navigate through location of warnings through the User Interface.

The sketch for the overview of our system is given on the next page.

High level overview: Project level
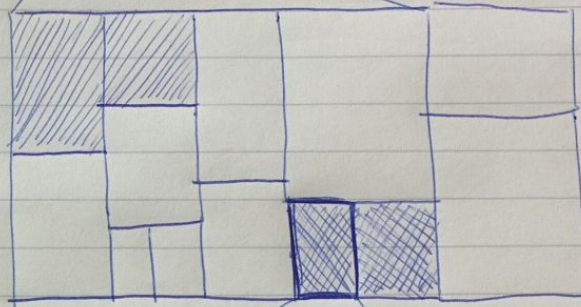
Provides complete
overview of source code.

Useful for:
overview,
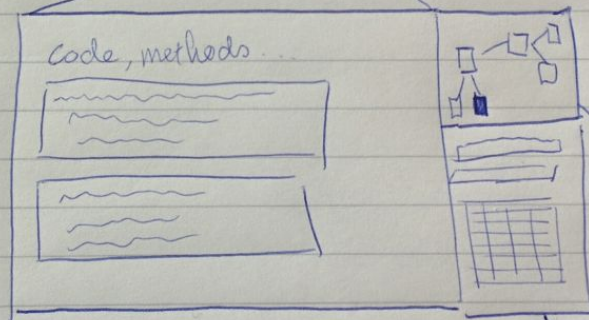interface problems (?)
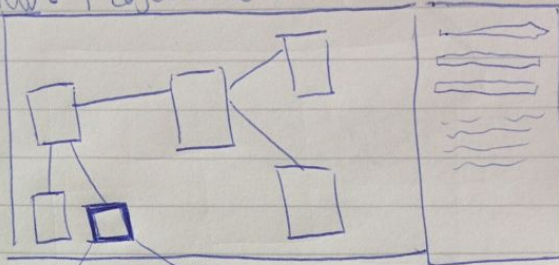
Medium level overview: Package level

Useful for:
coupling/cohesion,
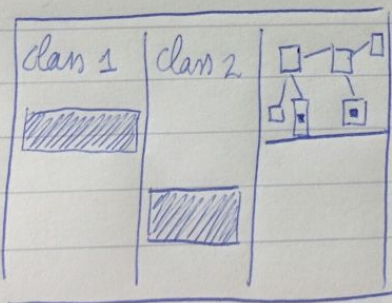class responsibility.

Low level view: Class level

code, methods...

Most useful for:
code style warnings,
logic errors

"minimap"

data,
menu

Compare classes example (e.g. duplicate code).

class 1   class 2

5. References

[1] TIOBE index http://www.tiobe.com/tiobe_index?page=programminglanguages_definition

[2] PYPL PopularitY index http://pypl.github.io/PYPL.html