Philipps-Universität Marburg
Fachbereich Mathematik und Informatik
AG Programmiersprachen und -werkzeuge

Philipps Universität Marburg

Improving Structure of Automatic Feedback to Programming Solutions

Motivation

Learning how to program is an important foundation of software engineering education, whereby students initially have to solve programming assignments with clearly defined goals, leading to relatively small programs. Traditionally, tutors would inspect their solutions and provide individual feedback; because of the manual effort the times to receive feedback must be restricted (typically only once) and there is a wait-time for receiving the feedback.
To facilitate students to receive feedback more often and almost instantaneously, the Programming Languages and Tools group is developing automatic feedback tools, called the Marburg university auto ASsess System (MASS). This is focused primarily on programming assignments in the Java language, but also feedback tools for the Racket language are developed. The feedback tools run on a server where students can submit their solution to specific assignments, whereby our goal is to give feedback on different aspects of the program (functional correctness, style, solution approach, testing, etc.) and to give constructive and individual feedback. To achieve a high relevance of the feedback, our tools allow features to configure the requirements to be checked and the feedback generation on a per-assignment basis.

Assignment

In a previous master thesis, different kinds and purposes of feedback to student solutions has been researched. A classification and a generic model for feedback has been developed and implemented in MASS for the checkers concerned with the solution approach, syntax and style mistakes. Examples for different aspects of feedback are: the technical cause, location of the reported problem in the solution, hints for improving the solution or examples of correct solutions. In this assignment, the feedback provided by further checkers should be analyzed and provided in terms of this developed model. That requires figuring out, which aspects of feedback are already covered in the current tools' messages, providing this information in a more structured way and finding ways of providing information on the missing feedback aspects. In this assignment the feedback from checkers for tests (test coverage checker, mutation testing checker) and class design (object oriented metrics, class info) should be extended. Another goal of this project is to ensure that lecturers can take advantage of the improved structure in configuring the generated feedback and to evaluate the usefulness of the provided feedback to students.

Further Reading

- Homepage of the Marburg university auto ASsess System (MASS) project. `https://qped-eu.github.io/mass/`. Accessed: 2023-10-26
- Omar Aji. Analyse und Generierung von Feedback zu Programmieraufgaben für Anfänger. Master thesis, Philipps-Universität Marburg, Germany, 2023. `https://uni-marburg.de/6Av6as`

Info


Electronic Teaching


Java


Bachelor or Master Thesis


Theory
Practice

Contact

Prof. Christoph Bockisch
Steffen Dick


`bockisch@mathematik.uni-marburg.de`