Project Abstract

Problem Context: Requirement change analysis provides developers a means to maximize the productivity of a project. Without the analysis of software requirement implementation resources may be drained and the maintainability of a software system may be compromised. Aim: My aim was to compile and create a tool that is able to analyze software requirements and provide useful statistics and feedback to developers. Challenges: Issue trackers do not hold the code base that the issues are for. Querying for requirements and their effects needs at least two maybe even three separate entities of information. The requirement analysis tool needs the project to have an issue tracker and a code repository in order to be effective. Another challenge is the lack of information available from a code repository at any given revision. Git will not provide all the information necessary to perform a proper analysis of an entire project’s requirements without rolling back to previous releases to obtain information. This is fine for smaller projects with lesser amounts of code. As the amount of code grows, so does the run time of the program due to it having to return to every single previous revision of a project. Results: I have created a beta release of a system that properly takes and analyzes the changes that happen to each class during the process of implementing a software requirement. Learned Topics: I learned about git and Jira APIs for python. I learned the importance of well-made requirements and the importance of proper issue tracking. I also learned a few things about databases as a result of working with large amounts of data. Next Steps: I will continue to work on this project as part of an Independent study CSC 400. The next steps are to improve upon the analysis tool and compute more metrics that are missing and necessary to provide a truly useful tool for developers. I am also writing a paper about the results of the projects which we plan to submit in a major internal peer-review conference such as the Mining Software Repository conference: https://conf.researchr.org/home/msr-2018
Figure: Number of classes that changed or not for implementing two tickets of the TIKA project.