# Abstract

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### Bug Fix-Time Prediction Model Using Naïve Bayes Classifier

ABSTRACT This thesis deals with mining historical bug repositories seeking to improve bug-fix time prediction models and triaging process. These improvements will have a positive impact on software development and management processes. However, reports added to the repository need to be inspected by a human, called the triager. If a report is meaningful, the triager decides how to organize the report for integration into the project's development process. We call triager decisions that organize reports for the development process, development-oriented decisions. We are concerned with two important questions during the coordination of development effort are which bugs to fix first and how long does it take to fix them. We propose a scheduling approach to stack bugs in a way that could lead to assign most of them to developers seeking to maximize the throughput of the maintenance phase. In addition, we investigate bug-fix time prediction models, which support developers cost/benefit analysis. Moreover, we propose a triage assisting recommender system that will help triagers with development-oriented decisions. This system calculates the best binning value to distinguish between fast and slowly fixed bugs. For example, using Q3*0.5 as a binning point, Eclipse JDT has precision 0.706, recall 0.956. Based on recall our suggested approach will build improved bug-fix time prediction models, as it denotes 40 % improvements over random classification. Furthermore, prediction models evaluating our proposed scheduling approach showed the ability to predict red-labeled bugs with precision of 60% to 85% and recall of 59% to 74% over four open source projects. For example, red-labeled Mozilla Firefox bugs were classified correctly with a precision of 0.85, a recall of 0.704. As a result, we strive to reduce human involvement in triage by moving the triager's role from having to gather information in order to make a decision to that of confirming suggestions made by our recommender system. ?