



Título: Characterizing the Exception Handling Code Coverage in Long-Lived Java Libraries

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Resumo:

Exception handling is a well-known error recovery approach used to improve software robustness. Modern programming languages (e.g., Java and C#) provide features to separate the error-handling code from the regular one, seeking to enhance software comprehensibility and maintainability. Nevertheless, the way exception handling code is structured in such languages may lead to multiples, different, and complex control flows, affecting the software testability. Testing became widely adopted by developers as a way to achieve better levels of software quality. Code coverage is commonly used as a metric to measure the efficacy and adequacy of testing. Prior studies have reported that exception handling code is typically neglected, not well tested, and its misuse can lead to reliability degradation and catastrophic failures. However, little is known about the relationship between testing practices and exception handling code coverage. In this exploratory study, we investigated whether the exception handling code is -- somehow and in which degree -- covered or not by unit test case suites of 21

long-lived Java libraries from the Apache Commons project. First, we used existing unit test case suites of each library and JaCoCo tool to compute the overall and the exception handling code coverage. Next, we performed statistical tests to analyze the similarity between the overall and the exceptional handling code coverage. Our results show that exception handling code coverage is significantly lower than the overall coverage, even when the overall code coverage is greater than 90%.

Banca:

- Prof. Dr. Lincoln Souza Rocha (MDCC/UFC - Orientador)
- Prof.^a Dr.^a Carla Ilane Moreira Bezerra (UFC - Coorientadora)
- Prof. Dr. João Bosco Ferreira Filho (MDCC/UFC)
- Dr. Ismayle de Sousa Santos (GREat/UFC)