Software Development Optimisation Theory Defined with Graphs

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The aim of the software development process is to produce the best possible product with the given resources (money, time). As a part of the development process, quality assurance must also be rationalized. To do so, an abstract space is defined (software testing space), where software product is presented using graph theory. Test graph presents software product with all its functionalities. Test cases in a test graph are connections between vertices and vertices represent unit tests. Test suite and test phase are defined as subgraphs of test graph. The weights in test graph represent the cost and value of implementation for functionality. The first optimization algorithm (A_1), designed as the first step in the optimization of the software testing process, eliminates duplicated test cases. The second algorithm (A_2) alters the quantity of test cases for a given test phase. It is the method of drastically reducing the testing cost while jeopardizing the quality of the product. The third algorithm is a construction of an Optimal Test Phase (OTP), it is A_3 - OTP Construction. This optimization means that a maximum quality, given the resources, is reached. Depending on the circumstances algorithms A_1 and A_2, and A_1 and A_3 can be used together.

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