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Empirical Exploration for the Correlation between Class Object-Oriented Connectivity-Based Cohesion and Coupling

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Abstract : Attributes and methods are the basic contents of an object-oriented class. The connectivity among these class members and the relationship between the class and other classes play an important role in determining the quality of an object-oriented system. Class cohesion evaluates the degree of relatedness of class attributes and methods, whereas class coupling refers to the degree to which a class is related to other classes. Researchers have proposed several class cohesion and class coupling measures. However, the correlation between class coupling and class cohesion measures have not been thoroughly studied. In this paper, using classes of three open-source Java systems, we empirically investigate the correlation between several measures of connectivity-based class cohesion and coupling. Four connectivity-based cohesion measures and eight coupling measures are considered in the empirical study. The empirical study results show that class connectivity-based cohesion and coupling internal quality attributes are inversely correlated. The strength of the correlation depends highly on the cohesion and coupling measurement approaches.

Keywords : object-oriented class, software quality, class cohesion measure, class coupling measure
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