UNIVERSITI PUTRA MALAYSIA

COHESION METRIC FOR JAVA INNER CLASS

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COHESION METRIC FOR JAVA INNER CLASS

By

TEE SIM HUI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

COHESION METRIC FOR JAVA INNER CLASS

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July 2012

Chair: Rodziah Binti Atan, PhD.

Faculty: Computer Science and Information Technology

Inner class is a helper class that is declared within the body of another class. To date, there is no cohesion metric specially designed for the inner classes. In current practice, the cohesion of inner classes is measured using the class cohesion metrics. However, the existing practice does not obtain the actual cohesion of inner class because the role of inner class as a helper class for its outer class is not evaluated. In this thesis, the cohesion of inner class is measured in term of the single functionality it has fostered for the outer class as a whole. A total of 74 inner classes from 15 applications were investigated. This research presents a novel twofold approach in measuring the in-bound cohesion and out-bound cohesion for inner classes. The results demonstrate that the proposed metric, namely Inner Class Based-ELCOM (IELCOM), is an improvement of its predecessor External Lack of Cohesion Metric (ELCOM) in terms of measuring the cohesion of inner class. This proposed approach enables the software practitioners to recognize the

cohesion of an inner class by considering the functional relationship between inner and outer class as an integrated whole.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

METRIK KEJELEKITAN UNTUK KELAS DALAMAN BAGI JAVA

Oleh

TEE SIM HUI

Julai 2012

Pengerusi: Rodziah Binti Atan, PhD.

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Kelas dalaman ialah kelas pembantu yang diisytihar pada bahagian badan dalam kelas lain. Setakat ini masih tiada lagi satu metrik kejelekitan direka khusus untuk mengukur kelas dalaman. Kaedah semasa hanya menggunakan metrik kejelekitan bagi kelas untuk mengukur kejelekitan bagi kelas dalaman. Bagaimanapun, kaedah semasa ini tidak berupaya untuk mendapatkan kejelekitan kelas dalaman yang tepat kerana peranan kelas dalaman sebagai kelas pembantu bagi kelas luaran tidak dinilaikan. Dalam tesis ini, kejelekitan kelas dalaman diukur berdasarkan fungsian tunggal antara kelas dalaman dan luaran. Secara keseluruhan, sebanyak 74 kelas dalaman daripada 15 aplikasi telah dikaji. Kajian ini juga mengemukakan suatu kaedah serampang dua mata bagi mengukurkan kejelekitan untuk kelas dalaman. Keputusan kajian ini menunjukkan bahawa metrik yang dicadangkan, Inner Class Based-ELCOM (IELCOM), telah mempertingkatkan metrik terdahulunya External Lack of Cohesion Metric (ELCOM) dari segi pengukuran kejelekitan bagi kelas dalaman. Pendekatan yang dicadang membolehkan pengamal

perisian mengenalpasti kejelekitan kelas dalaman dengan mengambilkira pertalian fungsian antara kelas dalaman dan luaran sebagai suatu integrasi keseluruhan.

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I certify that a Thesis Examination Committee has met on 6 July 2012 to conduct the final examination of Tee Sim Hui on his (or her) thesis entitled "**Cohesion Metric for Java Inner Class**" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirements for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

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TEE SIM HUI
Date: 6 July 2012

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