SOEN 6611 - WINTER 2015

Source Code Metrics

Assignment #3

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Understand API

Understand is an IDE that provides us with pertinent information regarding our code. It allows us to quickly see all information on functions, classes, variables, etc., how they are used, called, modified, and interacted with. We can easily see call trees, metrics, references and any other information we want to know about our code.

Understand helps in providing statistical information about projects or entities such as number of lines of code and the complexity of various entities. Understand generates Class OO Metrics Report for calculation of LCOM and CBO.

We have used Understand Python API scripts to fetch the attributes in order to calculate LCOM and CBO for four versions of Chromium. We created a database (.udb) in Understand. We were able to use the database inside the python script with the help of Understand API.

Source Code Metrics Calculation

We are checking for only C/C++ classes in the chrome dump. We calculated LCOM by comparing functions. We compared 2 classes, checked for functions, methods and procedures. Once done, we count the nodes to determine if they are sharing any attributes, functions or for any method calls. We are calculating the discrete graphs(Nodes independent or sharing any functionalities or methods). The count of discrete graph count is the value of LCOM (Hitz and Montazeri). For CBO, we are looking for classes with coupling i.e. inherited methods or import and export of methods from one class to another in all the files. This would give us count of CBO.

On analyzing the values of LCOM and CBO of various versions, we found the various outputs. In some classes value of CBO is increasing from current value, that means the coupling between classes is increasing. The dependency of one class on other classes is increasing. The same way value of LCOM is decreasing, that means the class is becoming more cohesive.

We saved the data on PostgreSQL. Attached Report.csv is the comparison of CBO and LCOM values of version 31, 32, 33, 34 (4 latest versions).