



Assignment-3

Calculate CBO & LCOM on Chrome release  
using  
UNDERSTAND API

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## 1. Description of Understand API and how we use it?

Understand is a source code analysis and metrics tool. It is designed to help maintain and understand large amounts of legacy or newly created source code. It provides a cross-platform, multi-language, maintenance-oriented IDE (interactive development environment).

The source code analysed may include C, C++, C#, Objective C/Objective C++, Ada, Java, Pascal/Delphi, COBOL, JOVIAL, VHDL, Fortran, PL/M, Python, PHP, HTML, CSS, JavaScript, and XML.

It offers code navigation using a detailed cross-referencing, a syntax-colorizing “smart” editor, and a variety of graphical reverse engineering views.

We use UNDERSTAND scitool software to generate database file of the chrome release classes. Then we use python UNDERSTAND API to interact with it via python script.

Understand API has wide variety of methods, which gives us power to calculate metrics and generate graphs for source code.

## 2. Description of coupling & cohesion measure and how we measure it?

We first created database file using understand sci tool. Then we take database file as input. And to interact with it we use the python Understand API.

First, we use “`understand.open(DB_ROOT_DIRECTORY)`” to establish connection with database file.

Then, we use “`understand.ents(“File”)`” to get all files, from all file we choose all .java, .cc, .cpp, .h & .py file.

Further we calculate, dependency of file using “`understand.depends()`” and “`understand.dependsby()`”. We calculate length of each and adding it we get our CBO.

For the LCOM, we are extracting all the functions and all the attributes from the file. We have calculated minimum number of links. Then we are checking it against the total number of links.

If the total number of links is greater than the minimum number of links then LCOM is 1. We have created recursive function to calculate the LCOM.

We have used understand api to get the list of functions and their references. We are also checking the attributes of the function so that we can get the relation between the function and attribute.

And on basis of that we can determine that if we are getting connected graph or not. How many are connected via edge and how many functions are individual? By calculating that we get out LCOM.