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COS 731 Assignment 1 Phase 2 Complexity Analysis

Overview of Metrics Measured

- Coupling Between Object Classes (CBO)
    - Coupling between objects (CBO) is a count of the number of classes that are coupled to a particular class i.e. where the methods of one class call the methods or access the variables of the other.
- Lack of Chesion of Methods (LCOM)
    - LCOM is viewed as a measure of how well the methods of the class co-operate to achieve the aims of the class. A low LCOM value suggests the class is more cohesive and is viewed as better.
- Cyclomatic Complexity

Process Followed to calculate Metrics

The Intellij Plugin for Java MetricReloaded was utilized in order to generate the software metrics reported in this dcoument. https://plugins.jetbrains.com/plugin/93-metricsreloaded

The raw CSV files can be found at : https://github.com/WMostert1/COS731-Assignment1-Phase2

The Chidamber-Kemerer metrics, specifically CBO and LCOM, serve to indicate the level of cohesion in the system as well as the coupling within the system. The cyclomatic dependency is also calculated with this tool.

The structural complexity and data complexity is calculated manually since no viable plugins or tool seem to be a good fit for such calculations. The system complexity is defined as the number of subordinate modules. Since only one modules is used in the system it is therefor 1. The data complexity is measured as the number of input paramteres for all ingress and egress endpoints of the system.

Metric	Phase1	Phase2	Comments
Structural Complexity	1	1	This is very low for a system, but to be expected since there is only one modules in the system.
Data Complexity	3.6	3.0	It is interesting to note that a decrease in data complexity is observed. This means that the value of data I/O was put to better use in the second phase.
System Complexity	4.6	4	This is expected.
Coupling	3.07	4.15	It's a bad sign that coupling has increased, one should always aim to have a loosely coupled system.
Cohesion	2.14	2.00	A good indication.

Cyclomatic Complexiity	1.1	1.2	The increase in complexity here is negligable.

Additional Metrics Measured

Metric	Phase 1	Phase2
Depth of Inheritance Tree	1.00	1.04
Number of Children	0.00	0.04
Response for Class	8.39	9.97
Weighted Methods for Class	5.57	6.23

Conclusion

It is clear that a general increase in complixety may be observed in the system. This may be due to the fact that as a system grows in size, it tends to grow in complexity. It may be noted that the only metric that decreased was the cohesion in the system.