Complexity Metrics

## Method Metrics

Worst 3 - Cognitive Complexity

| **Method** | **CogC** |
| --- | --- |
| GanttXMLOptionsParser.startElement() | 183.0 |
| TaskProperties.getProperty() | 58.0 |
| GPTimeUnitStack.parseDuration() | 53.0 |

Worst 3 - Essential Complexity

| **Method** | **ev(G)** |
| --- | --- |
| DateParser.getCalendar() | 16.0 |
| GPTimeUnitStack.parseDuration() | 12.0 |
| TaskManagerImpl.createLength() | 12.0 |

Worst 3 - Design Complexity

| **Method** | **iv(G)** |
| --- | --- |
| GanttXMLOptionsParser.startElement() | 78.0 |
| GanttTaskPropertiesBean.applySettings() | 33.0 |
| TaskManagerImpl.newTaskBuilder() | 22.0 |

Worst 3 - Cyclomatic Complexity

| **Method** | **v(G)** |
| --- | --- |
| GanttXMLOptionsParser.startElement() | 89.0 |
| GanttTaskPropertiesBean.applySettings() | 33.0 |
| GanttTreeTableModel.getValueAt() | 28.0 |

**Cognitive Complexity** - Calculates the Cognitive Complexity of each non-abstract method. The metric is similar to Cyclomatic Complexity, but is intended to explicitly measure understandability, which can be quite different from testability. Cognitive Complexity is increased with each control structure used and is higher the more nested control structures are. Abbreviation: *CogC*

**Essential Complexity** - Calculates the Essential Complexity of each non-abstract method. Essential Complexity is a graph-theoretic measure of just how ill-structured a method's control flow is. Essential Complexity ranges from 1 to v(G), the Cyclomatic Complexity of the method. Abbreviation: *ev(G)*

**Design Complexity** - Calculates the design complexity of a method. The design complexity is related to how interlinked a method's control flow is with calls to other methods. Design complexity ranges from 1 to v(G), the cyclomatic complexity of the method. Design complexity also represents the minimal number of tests necessary to exercise the integration of the method with the methods it calls. Abbreviation: *iv(G)*

**Cyclomatic Complexity -** Calculates the Cyclomatic Complexity of each non-abstract method. Cyclomatic complexity is a measure of the number of distinct execution paths through each method. This can also be considered as the minimal number of tests necessary to completely exercise a method's control flow. In practice, this is 1 + the number of if's, while's, for's, do's, switch cases, catches, conditional expressions, &&'s and ||'s in the method. Abbreviation: v(G)

## Comments

The most significant observation we can make with this data is the problematic complexity of the method *startElement()* from the class *GanttXMLOptionsParser*. Just taking a quick look at this method shows us the problem. It has **207 lines** mostly containing *if*’s and *else if*’s. This makes testing the method a very difficult and tedious task.

I would suggest, as usual, to divide the method in various separate methods, as this way we could test each method individually and thus more easily test the entire logic.

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## Complexity Metric Distributions







