

## Week 7 Metrics

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### TASK 1)

**SIZE)** 1) Total LOC: 22,539

2) Largest File: HTMLEditor.java LOC: 2,144

3) It appears that it counts every line that has a character in it or line of code; closing braces are counted; it seems comments are not counted

### Cohesion)

1) LCOM2 is the percentage of methods that do not access a specific attribute averaged over all the attributes in the class. Lower is better and means higher cohesion.

$$= LCOM2 = 1 - (\text{sum}(ma)) / (m * a)$$

2) JTreeTable.java. I think the reason the cohesion is so high is because of the lack of variables declared for this class. There are really only two methods declared for the whole class that are regularly referenced throughout the methods.

### Complexity)

1) 1.746

2) EventsManager.java : 2.5

3) In EventsManager.java I was able to reduce the Cyclomatic Complexity a small amount; from 2.5 to 2.469. In the method on line 90, I was able to reduce the complexity by removing a potential logical statement from the method which reduced its complexity.

### Package Level Coupling)

1) Afferent: The number of classes in other packages that depend on the classes in this package

Efferent: The number of classes in this package that depends on the classes in another package.

2) Afferent: main.java.memoranda.util with 57

3) Efferent: main.java.memoranda.ui with 49

### Worst Quality

1) AltHTMLWriter.java. This seems like poor quality code due to the high level of Cyclomatic Complexity (4.292), # of Parameters/Method (1.406) and nested block depth. This class also had 91 methods, and 1460 lines of code (1163 of method code); it seems based on the metrics that it's a large class that also is complex and dependent on other classes.

## Task 2 Refactoring

1)

Metric	Total	Mean	Std. Dev.	Maximum	Resource causing Maximum	Method
> McCabe Cyclomatic Complexity (avg/max per method)		2.24	2.851	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	setTableProperties
> Number of Parameters (avg/max per method)		0.928	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	setImageProperties
> Nested Block Depth (avg/max per method)		1.391	0.956	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java	getNotesForPeriod
> Afferent Coupling (avg/max per packageFragment)		19.333	19.653	57	/SER316-Spring-2018/src/main/java/memoranda/util	
> Efferent Coupling (avg/max per packageFragment)		11.444	15.276	49	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Instability (avg/max per packageFragment)		0.36	0.247	0.778	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Abstractness (avg/max per packageFragment)		0.111	0.137	0.333	/SER316-Spring-2018/src/main/java/memoranda/date	
> Normalized Distance (avg/max per packageFragment)		0.529	0.237	1	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/util	
> Depth of Inheritance Tree (avg/max per type)		2.652	1.934	6	/SER316-Spring-2018/src/main/java/memoranda/ui/JNCalendarCellRenderer.java	
> Weighted methods per Class (avg/max per type)	3253	14.143	25.533	242	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	
> Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	
> Number of Overridden Methods (avg/max per type)	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/table/TableModel.java	
> Lack of Cohesion of Methods (avg/max per type)		0.262	0.398	1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/CharTablePanel.java	
> Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	
> Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/Task.java	
> Number of Methods (avg/max per type)	1269	5.517	6.833	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	
> Number of Static Methods (avg/max per type)	183	0.796	2.51	17	/SER316-Spring-2018/src/main/java/memoranda/EventManager.java	
> Specialization Index (avg/max per type)		0.15	0.487	5	/SER316-Spring-2018/src/main/java/memoranda/ui/ProjectsTablePanel.java	
> Number of Classes (avg/max per packageFragment)	230	25.556	29.833	92	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Number of Interfaces (avg/max per packageFragment)	16	1.778	3.292	11	/SER316-Spring-2018/src/main/java/memoranda	
Number of Packages	9					
> Total Lines of Code	22540					
> Method Lines of Code (avg/max per method)	15638	10.77	28.219	346	/SER316-Spring-2018/src/main/java/memoranda/ui/PreferencesDialog.java	jblnit

7) 'After'

Metric	Total	Mean	Std. Dev.	Maximum	Resource causing Maximum	Method
> McCabe Cyclomatic Complexity (avg/max per method)		2.24	2.851	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	setTableProperties
> Number of Parameters (avg/max per method)		0.928	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	setImageProperties
> Nested Block Depth (avg/max per method)		1.391	0.956	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java	getNotesForPeriod
> Afferent Coupling (avg/max per packageFragment)		21.6	20.011	57	/SER316-Spring-2018/src/main/java/memoranda/util	
> Efferent Coupling (avg/max per packageFragment)		10.6	14.263	49	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Instability (avg/max per packageFragment)		0.335	0.243	0.778	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Abstractness (avg/max per packageFragment)		0.172	0.301	1	/SER316-Spring-2018/src/main/java/memoranda/interfaces	
> Normalized Distance (avg/max per packageFragment)		0.522	0.251	1	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/util	
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> Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/interfaces/ITask.java	
> Number of Methods (avg/max per type)	1269	5.517	6.833	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	
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> Number of Classes (avg/max per packageFragment)	230	23	28.174	92	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Number of Interfaces (avg/max per packageFragment)	16	1.6	3.169	11	/SER316-Spring-2018/src/main/java/memoranda/interfaces	
Number of Packages	10					
> Total Lines of Code	21652					
> Method Lines of Code (avg/max per method)	14888	10.253	27.188	345	/SER316-Spring-2018/src/main/java/memoranda/ui/PreferencesDialog.java	jblnit

8) Abstractness changed from a measure of 0.111 to 0.172 after the changes were made. This change occurred because we took some interfaces out of one of the main packages and into it's own separate interface package. This allowed for the main package and interface package to be less concrete and more abstract. This is better because in each package you would like to have a separation between the interfaces and the implementation of the classes.

## Task 3)

- 1) File AddResource.java. Code smell is Duplicate code where a couple of methods are called in two different methods in the same class. These lines of code are repetitive and can be

structured better if they're combined into a single method. I created a small method called 'bothMethods ()' that calls both of the methods that are called in `inetShortcutRB_actionPerformed` and `localFileRB_actionPerformed`.

## 2) INCOMPLETE

3)

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> Number of Methods (avg/max per type)	1270	5.522	6.836	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor.java	
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> Number of Packages	10					
> Total Lines of Code	21654					
> Method Lines of Code (avg/max per method)	14888	10.246	27.18	345	/SER316-Spring-2018/src/main/java/memoranda/ui/PreferencesDialog.java	jblnit

4) Number of methods and and weighted class per methods increased slightly for each of them. Besides these changes, none of the other metrics were changed after refactoring.