

Task 1

Size

1. 22539
2. HTMLEditor.java at 2144 LOC
3. It appears that the Metrics tool isn't counting comments or whitespace.

Cohesion

1. You would draw a MAG test, that is to draw a diagram with a class' methods and attributes, drawing lines from which method accesses which attributes. E = the number of edges in the diagram, n = the number of methods, and a = the number of attributes. The equation is then: $1 - e/(n*a)$.
2. LinkDialogue.java, it has many attributes but not many methods.

Complexity

1. 42
2. Finder.java with 5.5
- 3.

Package-level Coupling

1. The number of classes in other packages that depend on classes within the package is afferent coupling, whereas efferent coupling is the number of classes in other packages that the classes in the package depend on.
2. main.java.memoranda.util has the worst afferent coupling, 57
3. main.java.memoranda.ui has the worst efferent coupling, 49

Worst quality

I think that the worst class is the Finder.java class. It has the highest average Cyclomatic Complexity because it's trying to do too much. This class is difficult to read and traverse logically..

Task 2

The screenshot shows the Eclipse IDE interface. The Package Explorer on the left displays the project structure, including 'SER316-Spring-2018'. The main editor area shows the 'Finder.java' file. The 'Metrics' tab is active, displaying a table of McCabe Cyclomatic Complexity metrics for the project.

Metric	Total	Mean	Std. De	Maximum	Resource causing Maximum	Method
McCabe Cyclomatic Complexity (avg/max per method)	2.241	2.851		42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	setTableProperties
Number of Parameters (avg/max per method)	0.928	1.097		9	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	setImageProperties
Nested Block Depth (avg/max per method)	1.39	0.955		8	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	getNotesForPeriod
Afferent Coupling (avg/max per package)	19.333	19.653		57	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Efferent Coupling (avg/max per package)	11.444	15.276		49	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Instability (avg/max per package)	0.36	0.247		0.778	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Abstractness (avg/max per package)	0.111	0.137		0.333	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Normalized Distance (avg/max per package)	0.529	0.237		1	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Depth of Inheritance Tree (avg/max per package)	2.652	1.934		6	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Weighted methods per Class (avg/max per class)	3254	14.148	25.54	242	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Overridden Methods (avg/max per type)	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.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/Finder.java	
Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Methods (avg/max per type)	1269	5.517	6.833	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Static Methods (avg/max per type)	183	0.796	2.51	17	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Specialization Index (avg/max per type)		0.15	0.487	5	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Classes (avg/max per package)	230	25.556	29.833	92	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Interfaces (avg/max per package)	16	1.778	3.292	11	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Packages	9					
Total Lines of Code	22539					
Method Lines of Code (avg/max per method)	15637	10.769	28.219	346	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	jblnit

after

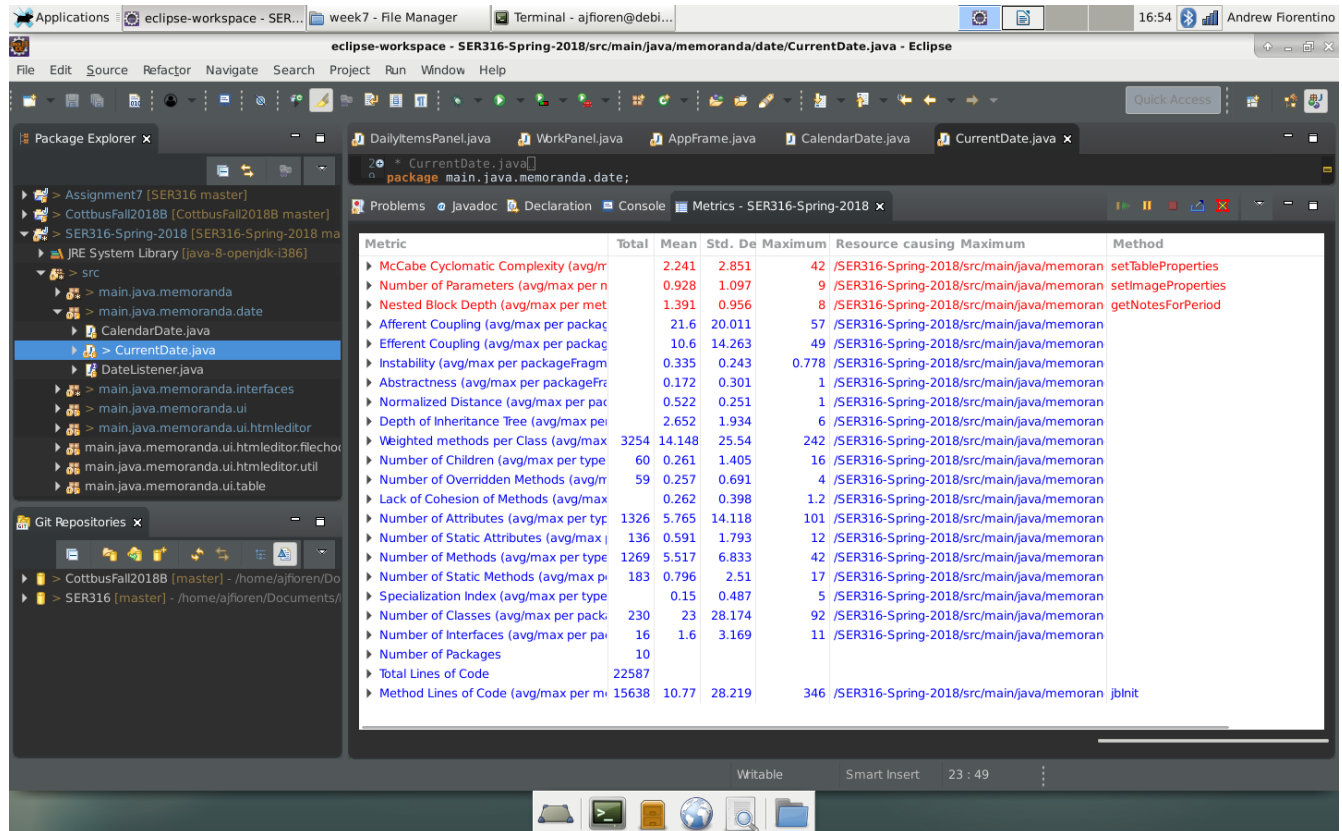
The screenshot shows the Eclipse IDE interface after refactoring. The Package Explorer on the left displays the project structure, including 'SER316-Spring-2018'. The main editor area shows the 'Finder.java' file. The 'Metrics' tab is active, displaying a table of McCabe Cyclomatic Complexity metrics for the project.

Metric	Total	Mean	Std. De	Maximum	Resource causing Maximum	Method
McCabe Cyclomatic Complexity (avg/max per method)	2.241	2.851		42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	setTableProperties
Number of Parameters (avg/max per method)	0.928	1.097		9	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	setImageProperties
Nested Block Depth (avg/max per method)	1.391	0.956		8	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	getNotesForPeriod
Afferent Coupling (avg/max per package)	21.6	20.011		57	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Efferent Coupling (avg/max per package)	10.6	14.263		49	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Instability (avg/max per package)	0.335	0.243		0.778	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Abstractness (avg/max per package)	0.172	0.301		1	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Normalized Distance (avg/max per package)	0.522	0.251		1	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Depth of Inheritance Tree (avg/max per package)	2.652	1.934		6	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Weighted methods per Class (avg/max per class)	3254	14.148	25.54	242	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Overridden Methods (avg/max per type)	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.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/Finder.java	
Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Methods (avg/max per type)	1269	5.517	6.833	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Static Methods (avg/max per type)	183	0.796	2.51	17	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Specialization Index (avg/max per type)		0.15	0.487	5	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Classes (avg/max per package)	230	23	28.174	92	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Interfaces (avg/max per package)	16	1.6	3.169	11	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	
Number of Packages	10					
Total Lines of Code	22587					
Method Lines of Code (avg/max per method)	15638	10.77	28.219	346	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/Finder.java	jblnit

8. Afferent and Efferent coupling changed, which make sense. Since some of the classes that were dependent on classes in the package were moved out of the package.

Task 3

1. In EventsManager.java the class getStickers creates a number of elements, but the identifiers for them start to get sloppy. I simply changed the name of a few of them to be more meaningful (and easier to read).
2. In CurrentDate.java there is a getter method that isn't very descriptive.
3. after



The screenshot shows the Eclipse IDE interface with the 'Metrics' view open for the project 'SER316-Spring-2018'. The 'CurrentDate.java' file is selected in the Package Explorer. The Metrics view displays a table of code quality metrics.

Metric	Total	Mean	Std. De	Maximum	Resource causing	Maximum	Method
▶ McCabe Cyclomatic Complexity (avg/m	2.241	2.851		42	/SER316-Spring-2018/src/main/java/memoranda		setTableProperties
▶ Number of Parameters (avg/max per n	0.928	1.097		9	/SER316-Spring-2018/src/main/java/memoranda		setImageProperties
▶ Nested Block Depth (avg/max per met	1.391	0.956		8	/SER316-Spring-2018/src/main/java/memoranda		getNotesForPeriod
▶ Afferent Coupling (avg/max per packag	21.6	20.011		57	/SER316-Spring-2018/src/main/java/memoranda		
▶ Efferent Coupling (avg/max per packag	10.6	14.263		49	/SER316-Spring-2018/src/main/java/memoranda		
▶ Instability (avg/max per package fragm	0.335	0.243		0.778	/SER316-Spring-2018/src/main/java/memoranda		
▶ Abstractness (avg/max per package frag	0.172	0.301		1	/SER316-Spring-2018/src/main/java/memoranda		
▶ Normalized Distance (avg/max per pac	0.522	0.251		1	/SER316-Spring-2018/src/main/java/memoranda		
▶ Depth of Inheritance Tree (avg/max per	2.652	1.934		6	/SER316-Spring-2018/src/main/java/memoranda		
▶ Weighted methods per Class (avg/max	3254	14.148		242	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Children (avg/max per type	60	0.261		16	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Overridden Methods (avg/m	59	0.257		4	/SER316-Spring-2018/src/main/java/memoranda		
▶ Lack of Cohesion of Methods (avg/max	0.262	0.398		1.2	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Attributes (avg/max per typ	1326	5.765		101	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Static Attributes (avg/max	136	0.591		12	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Methods (avg/max per type	1269	5.517		42	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Static Methods (avg/max per	183	0.796		17	/SER316-Spring-2018/src/main/java/memoranda		
▶ Specialization Index (avg/max per type	0.15	0.487		5	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Classes (avg/max per pack	230	23		92	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Interfaces (avg/max per pack	16	1.6		11	/SER316-Spring-2018/src/main/java/memoranda		
▶ Number of Packages	10						
▶ Total Lines of Code	22587						
▶ Method Lines of Code (avg/max per m	15638	10.77		346	/SER316-Spring-2018/src/main/java/memoranda		jblnit

4. The metrics appear to be the same, which isn't much of a surprise. Changing variable names will likely have no impact on performance, but will have an effect on readability.