

Task 1:

Size:

1. The total lines of code for main.java.memoranda is 2187.
2. The largest Class is EventsManager.java with 329LOC.
3. It counted all of the LOC that were not white space.

Cohesion:

1. LCOM2 is determined by the number of parameters and the number of methods that access them. The more the methods work on the same data the higher the cohesion.
2. TaskList.java, It is an interface!

Complexity:

1. The main package has an average cyclomatic complexity of 1.746 with a standard deviation of 1.547.
2. The EventsManager.java has the largest average cyclomatic complexity of 2.50.
3. Reduced NoteListImpl.Java to an average of 2.4. I did this by removing if statements and creating methods to do the same work.

Coupling:

1. Afferent- the number of classes outside the package that depend on classes in the package.
Efferent the number of classes outside the package that classes inside the package depend on.
2. The highest Afferent package is main.java.memoranda.util with a value of 57.
3. The highest Efferent package is main.java.memoranda.ui with a value of 49.

The worst quality class is events manager. It has the highest cyclomatic complexity, and depends on several classes outside of its package.

Joshua Owczarek
SER316 Spring B Online
Assignment 7 Refactoring/Metics

Task 2:
Before

The screenshot shows the Eclipse IDE with the file `SER316 - SER316-Spring-2018/src/main/java/memoranda/EventsManager.java` open. The code includes methods `createSticker` and `getStickers`. The Metrics view at the bottom displays the following table:

Metric	Total	Mean	Std. Dev.	Maximum	Resource causing Maximum	Meth
▶ McCabe Cyclomatic Complexity (avg/max per method)	2.239	2.849		42	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	setTa
▶ Number of Parameters (avg/max per method)	0.931	1.098		9	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	setm
▶ Nested Block Depth (avg/max per method)	1.39	0.955		8	/SER316-Spring-2018/src/main/java/memoranda/Not...	getNi
▶ Afferent Coupling (avg/max per packageFragment)	19.333	19.653		57	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Efferent Coupling (avg/max per packageFragment)	11.444	15.276		49	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Instability (avg/max per packageFragment)	0.36	0.247		0.778	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Abstractness (avg/max per packageFragment)	0.111	0.137		0.333	/SER316-Spring-2018/src/main/java/memoranda/date...	
▶ Normalized Distance (avg/max per packageFr...	0.529	0.237		1	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Depth of Inheritance Tree (avg/max per type)	2.652	1.934		6	/SER316-Spring-2018/src/main/java/memoranda/ui/J...	
▶ Weighted methods per Class (avg/max per type)	3256	14.157	25.552	242	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Overridden Methods (avg/max per...	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/ta...	
▶ Lack of Cohesion of Methods (avg/max per type)	0.262	0.398		1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/Tas...	
▶ Number of Methods (avg/max per type)	1271	5.526	6.843	42	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Static Methods (avg/max per type)	183	0.796	2.51	17	/SER316-Spring-2018/src/main/java/memoranda/Eve...	
▶ Specialization Index (avg/max per type)		0.15	0.487	5	/SER316-Spring-2018/src/main/java/memoranda/ui/P...	

After

The screenshot shows the Eclipse IDE with the file `SER316 - SER316-Spring-2018/src/main/java/memoranda/EventImpl.java` open. The code includes the `EventImpl` class. The Metrics view at the bottom displays the same table of code quality metrics as the 'Before' state:

Metric	Total	Mean	Std. Dev.	Maximum	Resource causing Maximum	Meth
▶ McCabe Cyclomatic Complexity (avg/max per method)	2.239	2.849		42	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	setTa
▶ Number of Parameters (avg/max per method)	0.931	1.098		9	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	setm
▶ Nested Block Depth (avg/max per method)	1.39	0.955		8	/SER316-Spring-2018/src/main/java/memoranda/Not...	getNi
▶ Afferent Coupling (avg/max per packageFragment)	21.6	20.011		57	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Efferent Coupling (avg/max per packageFragment)	10.6	14.263		49	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Instability (avg/max per packageFragment)	0.335	0.243		0.778	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Abstractness (avg/max per packageFragment)	0.172	0.301		1	/SER316-Spring-2018/src/main/java/memoranda/inte...	
▶ Normalized Distance (avg/max per packageFr...	0.522	0.251		1	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Depth of Inheritance Tree (avg/max per type)	2.652	1.934		6	/SER316-Spring-2018/src/main/java/memoranda/ui/J...	
▶ Weighted methods per Class (avg/max per type)	3256	14.157	25.552	242	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Overridden Methods (avg/max per...	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/ta...	
▶ Lack of Cohesion of Methods (avg/max per type)	0.262	0.398		1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/inte...	
▶ Number of Methods (avg/max per type)	1271	5.526	6.843	42	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
▶ Number of Static Methods (avg/max per type)	183	0.796	2.51	17	/SER316-Spring-2018/src/main/java/memoranda/Eve...	
▶ Specialization Index (avg/max per type)		0.15	0.487	5	/SER316-Spring-2018/src/main/java/memoranda/ui/P...	

Afferent coupling was increased after moving the interfaces into their own package and Efferent was reduced. Many classes in the original package are dependent on the interfaces which are now in a different package.

Task 3:

1.

main.java.memoranda.TaskListImpl.java

Line 174

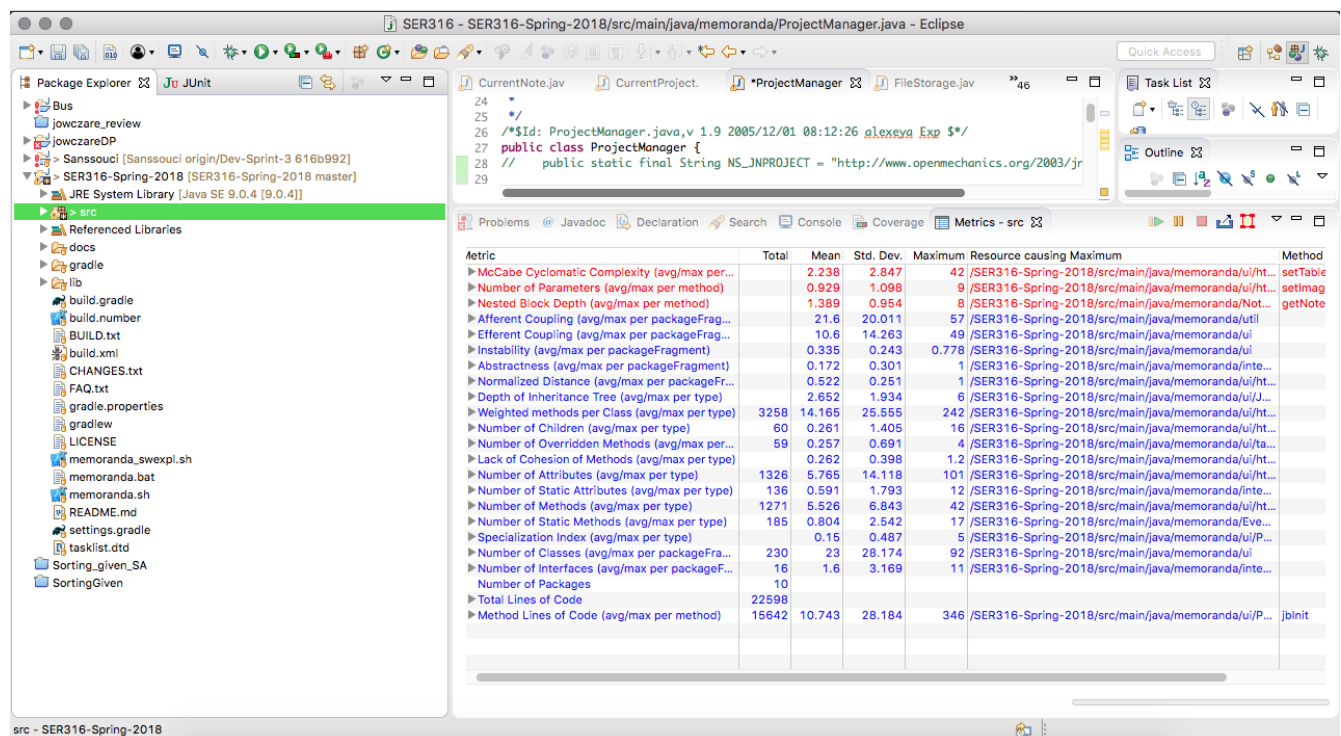
Long method. Created a boolean return variable and removed several else return statements.

2.

main.java.memoranda.ProjectManager.java

Indecent Exposure. Parameter with unnecessary public access. Changed to private and created accessors.

3.



Metric	Total	Mean	Std. Dev.	Maximum	Resource causing Maximum	Method
McCabe Cyclomatic Complexity (avg/max per method)	2.238	2.847		42	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	setTable
Number of Parameters (avg/max per method)	0.929	1.098		9	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	setimag
Nested Block Depth (avg/max per method)	1.389	0.954		8	/SER316-Spring-2018/src/main/java/memoranda/Not...	getNote
Afferent Coupling (avg/max per packageFrag...	21.6	20.011		57	/SER316-Spring-2018/src/main/java/memoranda/uti...	
Efferent Coupling (avg/max per packageFrag...	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/inte...	
Normalized Distance (avg/max per packageFr...	0.522	0.251		1	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
Depth of Inheritance Tree (avg/max per type)	2.652	1.934		6	/SER316-Spring-2018/src/main/java/memoranda/ui/J...	
Weighted methods per Class (avg/max per type)	3258	14.165	25.555	242	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
Number of Overridden Methods (avg/max per...	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/ta...	
Lack of Cohesion of Methods (avg/max per type)	0.262	0.398		1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/main/java/memoranda/inte...	
Number of Methods (avg/max per type)	1271	5.526	6.843	42	/SER316-Spring-2018/src/main/java/memoranda/ui/ht...	
Number of Static Methods (avg/max per type)	185	0.804	2.542	17	/SER316-Spring-2018/src/main/java/memoranda/Eve...	
Specialization Index (avg/max per type)		0.15	0.487	5	/SER316-Spring-2018/src/main/java/memoranda/ui/P...	
Number of Classes (avg/max per packageFra...	230	23	28.174	92	/SER316-Spring-2018/src/main/java/memoranda/ui...	
Number of Interfaces (avg/max per packageF...	16	1.6	3.169	11	/SER316-Spring-2018/src/main/java/memoranda/inte...	
Total Lines of Code	22598					
Method Lines of Code (avg/max per method)	15642	10.743	28.184	346	/SER316-Spring-2018/src/main/java/memoranda/ui/P... jblinit	

4. Nested block depth changed. By reducing the size of the method and depth of the nested blocks that metric improved.