Task 1

Size

1. Total LOC for the project is 22,585.
2. HTMLEditor.java is the single largest file in the project at 2,144 LOC.
3. It counts any line that is not whitespace or comments as a LOC and then adds it all up.

Cohesion

1. LCOM2 is the percentage of methods that do not access a specific attribute, averaged over all attributes in that class. It is calculated as LCOM2 = 1 – sum(mA)/(m*a).
2. CurrentNote.java has the highest cohesion because it has no if-else or switch statements or anything else that would create more edge cases and lower the cohesion. The code just executes the same way, every time.

Complexity

1. The cyclomatic complexity is 2.241 in the main package.
2. It is ProjectPackager.java with a CC of 5.667.
3. I could not find a way to do this.

Coupling

1. Afferent coupling is the amount of classes that depend on a given class, while Efferent coupling is the amount of classes the given classes depends on itself.
2. Main.java.memoranda.util
3. Main.java.memoranda.ui

Worst Quality

1. I think the ProjectPackager class has the worst quality. It has incredibly high cyclomatic complexity for this program with a score of 5.667, and has very low cohesion dude to having a lot of for loops with if else statements within. This creates a lot of edge cases and makes it an overall difficult class for debugging and testing.

Task 2

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum	Method
> McCabe Cyclomatic Complexity (avg/max per		2.241	2.851	42	/SER316-Spring-2018/src/main/java/memoranda/ui/...	setTableProperties
> Number of Parameters (avg/max per method)		0.928	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/...	setImageProperties
> Nested Block Depth (avg/max per method)		1.39	0.955	8	/SER316-Spring-2018/src/main/java/memoranda/Not...	getNotesForPeriod
> Afferent Coupling (avg/max per packageFragn		19.333	19.653	57	/SER316-Spring-2018/src/main/java/memoranda/util	
> Efferent Coupling (avg/max per packageFragm		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 packageFra		0.529	0.237	1	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> 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 typ	3254	14.148	25.54	242	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Overridden Methods (avg/max per	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/t...	
> Lack of Cohesion of Methods (avg/max per typ		0.262	0.398	1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> 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)	1269	5.517	6.833	42	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> 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/...	
> Number of Classes (avg/max per packageFragr	230	25.556	29.833	92	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Number of Interfaces (avg/max per packageFra	16	1.778	3.292	11	/SER316-Spring-2018/src/main/java/memoranda	
> 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/...	jbInit

Before

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum	Method
> McCabe Cyclomatic Complexity (avg/max per		2.237	2.847	42	/SER316-Spring-2018/src/main/java/memoranda/ui/...	setTableProperties
> Number of Parameters (avg/max per method)		0.926	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/...	setImageProperties
> Nested Block Depth (avg/max per method)		1.389	0.954	8	/SER316-Spring-2018/src/main/java/memoranda/Not...	getNotesForPeriod
> Afferent Coupling (avg/max per packageFragn		21.6	20.011	57	/SER316-Spring-2018/src/main/java/memoranda/util	
> Efferent Coupling (avg/max per packageFragm		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 packageFra		0.522	0.251	1	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Depth of Inheritance Tree (avg/max per type)		2.645	1.933	6	/SER316-Spring-2018/src/main/java/memoranda/ui/J...	
> Weighted methods per Class (avg/max per typ	3259	14.108	25.492	242	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Children (avg/max per type)	60	0.26	1.403	16	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Overridden Methods (avg/max per	59	0.255	0.69	4	/SER316-Spring-2018/src/main/java/memoranda/ui/t...	
> Lack of Cohesion of Methods (avg/max per typ		0.264	0.398	1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Attributes (avg/max per type)	1330	5.758	14.088	101	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Static Attributes (avg/max per type	136	0.589	1.79	12	/SER316-Spring-2018/src/main/java/memoranda/inte...	
> Number of Methods (avg/max per type)	1274	5.515	6.818	42	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Static Methods (avg/max per type)	183	0.792	2.505	17	/SER316-Spring-2018/src/main/java/memoranda/Eve...	
> Specialization Index (avg/max per type)		0.149	0.486	5	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Classes (avg/max per packageFragr	231	23.1	28.201	92	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Number of Interfaces (avg/max per packageFra	16	1.6	3.169	11	/SER316-Spring-2018/src/main/java/memoranda/inte...	
> Number of Packages	10					
> Total Lines of Code	22611					
> Method Lines of Code (avg/max per method)	15646	10.739	28.176	346	/SER316-Spring-2018/src/main/java/memoranda/ui/...	jbInit

After

8. The afferent and efferent coupling each went up and down, respectively, after the changes to the project. I would not say these results suggest the changes made the program any better.

Task 3

1. I changed main.java.memoranda.CurrentProject so that the notifyListenersBefore method would not have long parameters. I created a NotifyListenersParam class to take in the necessary data (since there is no other object that can currently fill this role) and refactored so that notifyListenersBefore took a NotifyListenersParam object as its sole parameter.
2. I changed main.java.memoranda.Start so that it did not include the unrelated SLThread class. This issue was something I identified as a Divergent change code smell. I fixed the code smell by refactoring so that SLThread was its own standalone class within the package, and then Start references it appropriately.

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum	Method
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> Number of Parameters (avg/max per method)		0.926	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/...	setImageProperties
> Nested Block Depth (avg/max per method)		1.389	0.954	8	/SER316-Spring-2018/src/main/java/memoranda/Not...	getNotesForPeriod
> Afferent Coupling (avg/max per packageFragn		21.7	19.975	57	/SER316-Spring-2018/src/main/java/memoranda/util	
> Efferent Coupling (avg/max per packageFragm		10.7	14.304	49	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Instability (avg/max per packageFragment)		0.336	0.24	0.766	/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 packageFra		0.522	0.249	1	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Depth of Inheritance Tree (avg/max per type)		2.645	1.933	6	/SER316-Spring-2018/src/main/java/memoranda/ui/J...	
> Weighted methods per Class (avg/max per typ	3259	14.108	25.492	242	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Children (avg/max per type)	60	0.26	1.403	16	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Overridden Methods (avg/max per	59	0.255	0.69	4	/SER316-Spring-2018/src/main/java/memoranda/ui/t...	
> Lack of Cohesion of Methods (avg/max per typ		0.264	0.398	1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Attributes (avg/max per type)	1330	5.758	14.088	101	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Static Attributes (avg/max per type	136	0.589	1.79	12	/SER316-Spring-2018/src/main/java/memoranda/inte...	
> Number of Methods (avg/max per type)	1274	5.515	6.818	42	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Static Methods (avg/max per type)	183	0.792	2.505	17	/SER316-Spring-2018/src/main/java/memoranda/Eve...	
> Specialization Index (avg/max per type)		0.149	0.486	5	/SER316-Spring-2018/src/main/java/memoranda/ui/...	
> Number of Classes (avg/max per packageFragn	231	23.1	28.201	92	/SER316-Spring-2018/src/main/java/memoranda/ui	
> Number of Interfaces (avg/max per packageFra	16	1.6	3.169	11	/SER316-Spring-2018/src/main/java/memoranda/inte...	
> Number of Packages	10					
> Total Lines of Code	22614					
> Method Lines of Code (avg/max per method)	15646	10.739	28.176	346	/SER316-Spring-2018/src/main/java/memoranda/ui/...	jbInit

3.

After

4. The afferent and efferent coupling each went up and down, respectively, but I would not really say the changes made had a positive effect on the program as a whole.