Task 1 – Size:

1. The Total LOC in the project is 22,539. The Total LOC for the project main.java.memoranda folder is 2,187.
2. The largest single code file in the project package main.java.memoranda is EventsManager.java with 329 Total LOC.
3. The Eclipse Metric tool counted all lines occupied by a method. This did not include blank lines and comments; it did include lines with closing braces and imports.

Task 1 – Cohesion:

1. LCOM2 is the percentage of methods that do not access a specific attribute averaged over all attributes in the class.
   Formula: $LCOM2 = 1 - sum(number\ of\ methods\ that\ access\ a\ variable)/(number\ of\ methods\ in\ the\ class - 1)$
2. In project package main.java.memoranda, there are several files with 0, which indicates high cohesion. As an example, Start.java has 0 for cohesion which makes sense because the class only has one method, which uses all the class variables. {((1-1)/(1-1)) = 0}

Task 1 – Complexity:

1. In project package main.java.memoranda, the cyclomatic complexity is 1.746.
2. In project package main.java.memoranda, on average, the EventsManager.java class has the worst McCabe C.C. at 2.5.
3. In main/java/memoranda/util/EventsManager.java ~Line 173, I extracted some of the logic from the getRepeatableEvents method into a separate, smaller, helper method directly below (~232).

Task 1 – Package-Level Coupling

1. Afferent Coupling is a measure of the number of dependencies ON a package; it is the package's responsibility in the project. Efferent Coupling is a measure of the number of dependencies OF a package; it is the package's dependence on other parts of the project.
2. The main.java.memoranda.util package has the worst Afferent Coupling measure at 57. (many parts of the project depend on this package).
3. The main.java.memoranda.ui package has the worst Efferent Coupling measure at 49. (this package depends on many other parts of the project).

Task 2 – before:

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum
> McCabe Cyclomatic Complexity (avg/max per m		2.24	2.838	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor
> Number of Parameters (avg/max per method)		0.929	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor
> Nested Block Depth (avg/max per method)		1.39	0.954	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java
> Afferent Coupling (avg/max per packageFragme		19.333	19.653	57	/SER316-Spring-2018/src/main/java/memoranda/util
> Efferent Coupling (avg/max per packageFragme		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 packageFrag		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/JNCalendarCellRendere
> Weighted methods per Class (avg/max per type)	3255	14.152	25.548	242	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor
> Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor
> Number of Overridden Methods (avg/max per ty	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/ui/table/TableMap.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/CharTableP.
> Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HTMLEditor
> 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
> Number of Static Methods (avg/max per type)	184	0.8	2.539	18	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.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 packageFragm	230	25.556	29.833	92	/SER316-Spring-2018/src/main/java/memoranda/ui
> Number of Interfaces (avg/max per packageFrag	16	1.778	3.292	11	/SER316-Spring-2018/src/main/java/memoranda
> Number of Packages	9				
> Total Lines of Code	22544				
> Method Lines of Code (avg/max per method)	15640	10.764	28.206	346	/SER316-Spring-2018/src/main/java/memoranda/ui/PreferencesDialog.java

Task 2 – after:

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum
> McCabe Cyclomatic Complexity (avg/max per m		2.24	2.838	42	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Parameters (avg/max per method)		0.929	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/
> Nested Block Depth (avg/max per method)		1.39	0.954	8	/SER316-Spring-2018/src/main/java/memoranda/
> Afferent Coupling (avg/max per packageFragme		21.6	20.011	57	/SER316-Spring-2018/src/main/java/memoranda/
> Efferent Coupling (avg/max per packageFragme		10.6	14.263	49	/SER316-Spring-2018/src/main/java/memoranda/
> Instability (avg/max per packageFragment)		0.335	0.243	0.778	/SER316-Spring-2018/src/main/java/memoranda/
> Abstractness (avg/max per packageFragment)		0.172	0.301	1	/SER316-Spring-2018/src/interfaces
> Normalized Distance (avg/max per packageFrag		0.522	0.251	1	/SER316-Spring-2018/src/main/java/memoranda/
> Depth of Inheritance Tree (avg/max per type)		2.652	1.934	6	/SER316-Spring-2018/src/main/java/memoranda/
> Weighted methods per Class (avg/max per type)	3255	14.152	25.548	242	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Children (avg/max per type)	60	0.261	1.405	16	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Overridden Methods (avg/max per ty	59	0.257	0.691	4	/SER316-Spring-2018/src/main/java/memoranda/
> Lack of Cohesion of Methods (avg/max per type		0.262	0.398	1.2	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Attributes (avg/max per type)	1326	5.765	14.118	101	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Static Attributes (avg/max per type)	136	0.591	1.793	12	/SER316-Spring-2018/src/interfaces/ITask.java
> Number of Methods (avg/max per type)	1269	5.517	6.833	42	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Static Methods (avg/max per type)	184	0.8	2.539	18	/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 packageFragm	230	23	28.174	92	/SER316-Spring-2018/src/main/java/memoranda/
> Number of Interfaces (avg/max per packageFrag	16	1.6	3.169	11	/SER316-Spring-2018/src/interfaces
> Number of Packages	10				
> Total Lines of Code	22591				
> Method Lines of Code (avg/max per method)	15640	10.764	28.206	346	/SER316-Spring-2018/src/main/java/memoranda/

Task 2 – Eclipse Refactorings

8. Comparing the metrics before and after the refactor doesn't show much of a difference; there is a slight increase of afferent coupling and decrease of efferent coupling. While there are more dependencies on the new interface package, I think that these slight changes are for the better and increase encapsulation and safety of the program overall.

Task 3

1. In main/java/memoranda/util/AgendaGenerator.java Line ~256, I changed the Code Smell of a switch statement to use an if-else block instead. This change leaves no room for misinterpretation.
2. main/java/memoranda/ui/htmleditor/util/Local.java seemed like a lazy class, so I extracted the logic for managing messages to the utility class in main/java/memoranda/util/Util.java.

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum
> McCabe Cyclomatic Complexity (avg/max per n		2.24	2.838	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HT
> Number of Parameters (avg/max per method)		0.929	1.097	9	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HT
> Nested Block Depth (avg/max per method)		1.391	0.954	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java
> Afferent Coupling (avg/max per packageFragme		23.889	23.278	69	/SER316-Spring-2018/src/main/java/memoranda/util
> Efferent Coupling (avg/max per packageFragme		11.778	14.566	49	/SER316-Spring-2018/src/main/java/memoranda/ui
> Instability (avg/max per packageFragment)		0.369	0.229	0.778	/SER316-Spring-2018/src/main/java/memoranda/ui
> Abstractness (avg/max per packageFragment)		0.192	0.312	1	/SER316-Spring-2018/src/interfaces
> Normalized Distance (avg/max per packageFrag		0.473	0.209	0.752	/SER316-Spring-2018/src/main/java/memoranda/util
> Depth of Inheritance Tree (avg/max per type)		2.659	1.935	6	/SER316-Spring-2018/src/main/java/memoranda/ui/JNCalendarCe
> Weighted methods per Class (avg/max per type)	3255	14.214	25.605	242	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HT
> Number of Children (avg/max per type)	60	0.262	1.408	16	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HT
> Number of Overridden Methods (avg/max per ty	59	0.258	0.692	4	/SER316-Spring-2018/src/main/java/memoranda/ui/table/TableMa
> Lack of Cohesion of Methods (avg/max per type		0.263	0.398	1.2	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/CH
> Number of Attributes (avg/max per type)	1326	5.79	14.143	101	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HT
> Number of Static Attributes (avg/max per type)	136	0.594	1.802	12	/SER316-Spring-2018/src/interfaces/ITask.java
> Number of Methods (avg/max per type)	1269	5.541	6.838	42	/SER316-Spring-2018/src/main/java/memoranda/ui/htmleditor/HT
> Number of Static Methods (avg/max per type)	184	0.803	2.588	18	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.ja
> Specialization Index (avg/max per type)		0.151	0.488	5	/SER316-Spring-2018/src/main/java/memoranda/ui/ProjectsTableF
> Number of Classes (avg/max per packageFragm	229	25.444	28.675	92	/SER316-Spring-2018/src/main/java/memoranda/ui
> Number of Interfaces (avg/max per packageFrac	16	1.778	3.292	11	/SER316-Spring-2018/src/interfaces
> Number of Packages	9				
> Total Lines of Code	22584				
> Method Lines of Code (avg/max per method)	15637	10.762	28.203	346	/SER316-Spring-2018/src/main/java/memoranda/ui/PreferencesDia

Task 3

4. There is not much difference between my metrics now and at the end of Task 2. Probably for the worse, I slightly increased the coupling and instability. Maybe for the better, I decreased the number of classes, packages, normalized distance, and total LOC because I eliminated a lazy class.