Assignment 7

CLASS: SER316 SPRING SESSION A
INSTRUCTOR: MEHLHASE
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Contents

Task 1

Size

1. Total LOC is 2187
2. Largest single file by LOC: EventsManager.java
3. It counted by Lines of Code (duh), but it counted every line except blanks and comments

Cohesion

1. LCOM2 = equals the percentage of methods that do not access a specific attribute averaged over all attributes in the class. If the number of methods or attributes is zero, LCOM2 is undefined and displayed as zero. **LCOM2 = 1 - sum(mA)/(m*a)**
2. CurrentNote.java has the highest "Cohesion." Because the only attributes accessed by the methods are within the class itself.

Complexity

1. Cyclomatic complexity of the main package is 1.746
2. EventsManager.java has the work CC at 2.5
3. History.java Reduced complexity from 2.48 to 2.24 by updating the update() method to assume the button should be set false then checking if it should be set enabled. This reduced the complexity because there was only one evaluation instead of two. Note is titled //SER 316 Task 1 Complexity #3

Package Level Coupling

1. Afferent coupling is a measurement of how many other classes depend on the measured class. Efferent coupling is a measurement of how many classes the measured class depends on. The distinction is literally one measures how many classes are dependent on it and the other how many classes it depends on.
2. Main.java.memoranda.util has the highest Afferent Coupling measure at 57
3. Main.java.memoranda.ui has the highest Efferent Coupling measure at 49

Worst Quality

EventsManager.java has the worst quality code for two reasons. First, it has the highest CC (2.5) which means that it is more likely to generate errors or issues. Second, many of the methods require many parameters (average 1.125). This indicates that there are opportunities to implement other classes instead of passing around multiple parameters.

Task 2

Task 2.1

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum	Method
McCabe Cyclomatic Complexity (avg/max per		1.746	1.547	16	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	getRepeatableEventsFor...
Number of Parameters (avg/max per method)		0.675	1.004	8	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	createRepeatableEvent
Nested Block Depth (avg/max per method)		0.997	0.945	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java	getNotesForPeriod
Afferent Coupling	34					
Efferent Coupling	21					
Instability	0.382					
Abstractness	0.275					
Normalized Distance	0.343					
Depth of Inheritance Tree (avg/max per type)		0.854	0.607	2	/SER316-Spring-2018/src/main/java/memoranda/EventsScheduler.java	
Weighted methods per Class (avg/max per typ	585	14.268	16.081	71	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Number of Children (avg/max per type)	23	0.561	1.624	10	/SER316-Spring-2018/src/main/java/memoranda/ProjectListener.java	
Number of Overridden Methods (avg/max per	3	0.073	0.341	2	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Lack of Cohesion of Methods (avg/max per typ		0.093	0.211	0.679	/SER316-Spring-2018/src/main/java/memoranda/TaskListImpl.java	
Number of Attributes (avg/max per type)	30	0.732	1.037	4	/SER316-Spring-2018/src/main/java/memoranda/TaskListImpl.java	
Number of Static Attributes (avg/max per type	46	1.122	2.549	12	/SER316-Spring-2018/src/main/java/memoranda/Task.java	
Number of Methods (avg/max per type)	274	6.683	7.687	37	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Number of Static Methods (avg/max per type)	61	1.488	3.768	17	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	
Specialization Index (avg/max per type)		0.05	0.308	2	/SER316-Spring-2018/src/main/java/memoranda/Start.java	
Number of Classes	41					
Number of Interfaces	11					
Total Lines of Code	2185					
Method Lines of Code (avg/max per method)	1257	3.752	5.203	33	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	getRepeatableEventsFor...

Task 2.7

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum	Method
McCabe Cyclomatic Complexity (avg/max per		2.033	1.737	16	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	getRepeatableEventsFor...
Number of Parameters (avg/max per method)		0.707	1.009	8	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	createRepeatableEvent
Nested Block Depth (avg/max per method)		1.38	0.841	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java	getNotesForPeriod
Afferent Coupling	31					
Efferent Coupling	16					
Instability	0.34					
Abstractness	0					
Normalized Distance	0.66					
Depth of Inheritance Tree (avg/max per type)		1.167	0.373	2	/SER316-Spring-2018/src/main/java/memoranda/EventsScheduler.java	
Weighted methods per Class (avg/max per typ	492	16.4	17.85	71	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Number of Children (avg/max per type)	0	0	0	0	/SER316-Spring-2018/src/main/java/memoranda/ProjectManager.java	
Number of Overridden Methods (avg/max per	3	0.1	0.396	2	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Lack of Cohesion of Methods (avg/max per typ		0.127	0.237	0.679	/SER316-Spring-2018/src/main/java/memoranda/TaskListImpl.java	
Number of Attributes (avg/max per type)	30	1	1.095	4	/SER316-Spring-2018/src/main/java/memoranda/TaskListImpl.java	
Number of Static Attributes (avg/max per type	29	0.967	2.008	7	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	
Number of Methods (avg/max per type)	181	6.033	7.834	37	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Number of Static Methods (avg/max per type)	61	2.033	4.278	17	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	
Specialization Index (avg/max per type)		0.068	0.359	2	/SER316-Spring-2018/src/main/java/memoranda/Start.java	
Number of Classes	30					
Number of Interfaces	0					
Total Lines of Code	2062					
Method Lines of Code (avg/max per method)	1257	5.194	5.476	33	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	getRepeatableEventsFor...

Task 2.8

The scores for coupling both afferent and efferent have been improved for the package. This is a result of interfaces having an inherently high afferent coupling as they are exclusively used by other classes. These metrics changed for the better. The reason they changed is because the interfaces which had fairly high coupling scores were moved out of the package into another package.

Task 3

1. Conditional Complexity Smell in History.java(rollback())

To remediate, made the assumption that prev started as null and decremented p as soon as the method was called. This removed the need to have a second evaluation.

2. Duplicate code between classes EventsManager.java getRepeatableEvents

The issue here was they were doing their own if then statements for skipping over non-working days. There was an implementation of that which returns a Boolean in EventImpl.java which we have switched the code to using instead.

3.

Metric	Total	Mean	Std. Dev.	Maxim...	Resource causing Maximum	Method
McCabe Cyclomatic Complexity (avg/max per		2.021	1.67	15	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java	getNotesForPeriod
Number of Parameters (avg/max per method)		0.707	1.009	8	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	createRepeatableEvent
Nested Block Depth (avg/max per method)		1.38	0.841	8	/SER316-Spring-2018/src/main/java/memoranda/NoteListImpl.java	getNotesForPeriod
Afferent Coupling	31					
Efferent Coupling	16					
Instability	0.34					
Abstractness	0					
Normalized Distance	0.66					
Depth of Inheritance Tree (avg/max per type)		1.167	0.373	2	/SER316-Spring-2018/src/main/java/memoranda/EventsScheduler.java	
Weighted methods per Class (avg/max per typ	489	16.3	17.685	71	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Number of Children (avg/max per type)	0	0	0	0	/SER316-Spring-2018/src/main/java/memoranda/ProjectManager.java	
Number of Overridden Methods (avg/max per	3	0.1	0.396	2	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Lack of Cohesion of Methods (avg/max per typ		0.127	0.237	0.679	/SER316-Spring-2018/src/main/java/memoranda/TaskListImpl.java	
Number of Attributes (avg/max per type)	30	1	1.095	4	/SER316-Spring-2018/src/main/java/memoranda/TaskListImpl.java	
Number of Static Attributes (avg/max per type	29	0.967	2.008	7	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	
Number of Methods (avg/max per type)	181	6.033	7.834	37	/SER316-Spring-2018/src/main/java/memoranda/TaskImpl.java	
Number of Static Methods (avg/max per type)	61	2.033	4.278	17	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	
Specialization Index (avg/max per type)		0.068	0.359	2	/SER316-Spring-2018/src/main/java/memoranda/Start.java	
Number of Classes	30					
Number of Interfaces	0					
Total Lines of Code	2058					
Method Lines of Code (avg/max per method)	1253	5.178	5.466	34	/SER316-Spring-2018/src/main/java/memoranda/EventsManager.java	getRepeatableEventsFor...

4. The Metrics for the package have improved from the complexity metric as it dropped from 2.033 to 2.021. This is a result of simplifying the conditional statements as wells eliminating some of them from the package by eliminating them all together.