

## Change request log

### 1 Team

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### 2 Change Request

The Merge module throws an exception upon attempting to merge page ranges that intersect. The request is to fix this issue by allowing intersection of ranges during the merging operation.

### 3 Concept Location

The following is the concept location process for the change request "Merge":

Step #	Description	Rationale
1	<i>I ran the system</i>	
2	<i>It is clear from the sub-projects name that this fix would go into the pdfsam-merge.</i>	<i>As the name of the project and the change request name sync very well.</i>
3	<i>Searched for the word's "range", "overlap", "intersect", "page range" at the top-level directory of the pdfsam-merge project using grep</i>	<i>As usually the name of the variables or comments match the functionality of what they are describing, I used this search to figure out the usage of intersect/range at various places.</i>
3	<i>I skimmed through lot of the results</i>	<i>This helped to find the files with most used names of the above searched key words</i>
4	<i>Found the usage in the classes PageRangesColumn, MergeSelectionPane etc in this project</i>	<i>Looking through the function comments and the class variable type I quickly figured that these classes are associated with the changed.</i>
5	<i>After a lot of struggle, I found the ConversionUtils class, as this class is outside the pdfsam-merge package, it took me a while to figure out that this file needs changes.</i>	<i>Searching in a specific dir. was a bad idea. I should have just search at the top level dir. first and then went into the sub dir.</i>

Time spent (in minutes): 90

## 4 Impact Analysis

For this change request impact analysis

Step #	Description	Rationale
1	<i>After looking through the selected files for a while, it is clear changes are probably only required to the ConversionUtils class and specifically to the method toPageRangeSet(). So, the code change impact is minor</i>	<i>As page range set is provided by this method, figured that this is only methods that needs the change.</i>

Time spent (in minutes): 30

## 5 Actualization

Steps followed while making code changes.

Step #	Description	Rationale
1	<i>First, I added only a small if-else clause to understand the scenario of intersecting and non-intersecting case. And added a log message to the intersect case.</i>	<i>To verify that any changed to intersect clause doesn't affect the existing functionality</i>
2	<i>Then moved on the filling the intersect clause with adjusting the pageRangeSet with range that is valid.</i>	<i>Added the request core logic to handle overlapping merges</i>
3	<i>Then ran the merge operation with overlapping page range.</i>	<i>To verify the added functionality, I ran the changes. Multiple iterations of this resulted in a working change.</i>

Time spent (in minutes): 60

## 6 Validation

Use the table below to describe any validation activity (e.g., testing, code inspections, etc.) you performed for this change request. Include the description of each test case, the result (pass/fail) and its rationale.

Make sure you time yourselves when going through this process and provide the total time spent below.

Step #	Description	Rationale
1	<i>Test case defined: Inputs: 1-8, 6, 6-10 Expected: 1-8, 9-10</i>	<i>Test passed.</i>

2	<i>Test case defined:</i> <i>Inputs: 1-15, 8-20</i> <i>Expected: 1-15, 16-20</i>	<i>Test Passed.</i>
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Time spent (in minutes): 30

## 7 Timing

Summarize the time spent on each phase.

Phase Name	Time (in minutes)
Concept location	120
Impact Analysis	30
Prefactoring	
Actualization	60
Postfactoring	
Verification	45
<b>Total</b>	255

## 8 Conclusions

*I think I wasted a lot of time during concept localization. Instead of searching the the top-level directory, I searched only in the pdfsam-merge project. That costed me at least an hour more. This project is structed very well. Although the comments on the functionality is less, the overall design made it easy to reach the ConversionUtils class. Change request testing was little hard, as the concept is confusing. I had to read the change request requirement multiple times and understand the example provided by professor very well.*

*Classes and methods modified:*

- pdfsam-core/src/main/java/org/pdfsam/support/params/ConversionUtils.java
  - ConversionUtils::toPageRangeSet()