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# LATEX EDITOR PROJECT

## REENGINEERING THE LEGACY CODE

### OVERALL REPORT

VERSION <1.0>

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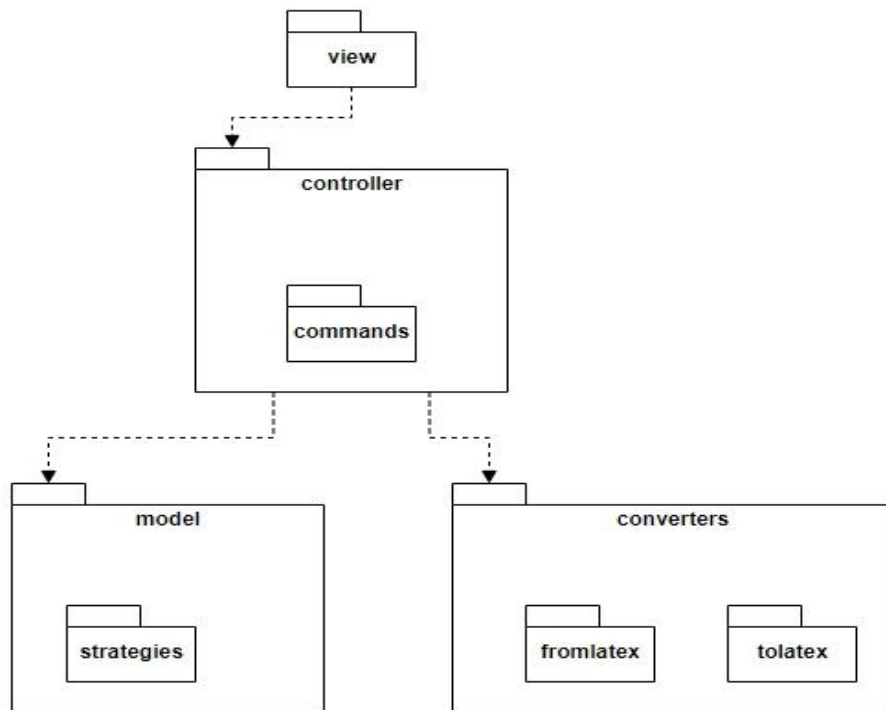
## INTRODUCTION

Given a legacy program, the goal of this project is to reengineer and extend the existing Java application. Each class has too many responsibilities and dependencies on another and the structure of the code is both hard to understand and difficult to extend. That is why the responsibility of this project and what we have improved is the quality of the existing implementation. It is refactored in such a way, that it is easier to read, has less dependencies and more clear responsibilities for each class and is suitable to build new features on.

Also, a new feature regarding saving and loading html documents as/from latex respectively is now available, with a structure that is easy to add more formats into it in the future.

## REFACTORED DESIGN

### ARCHITECTURE



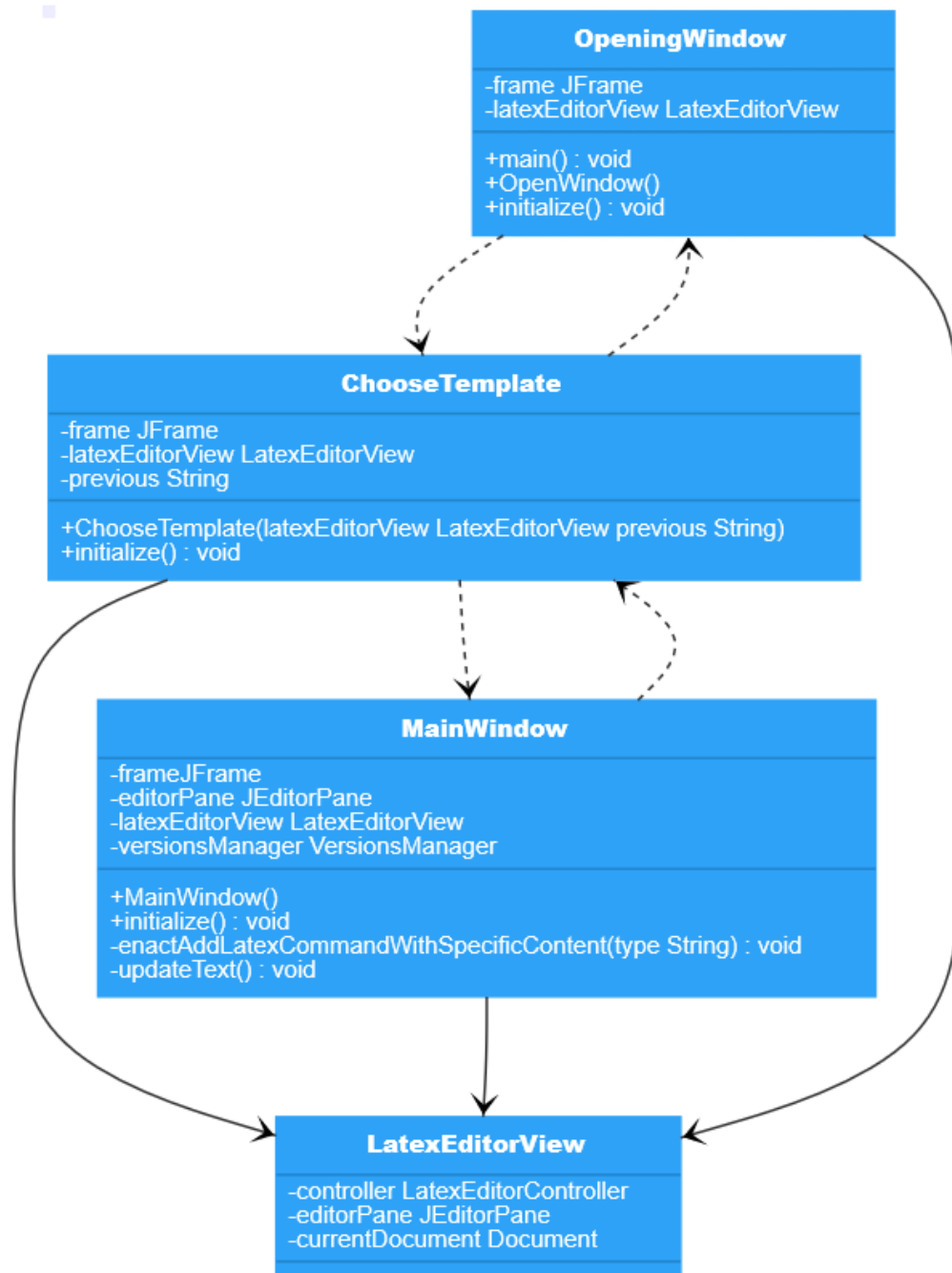


Figure 1: View package



Figure 2: controller package

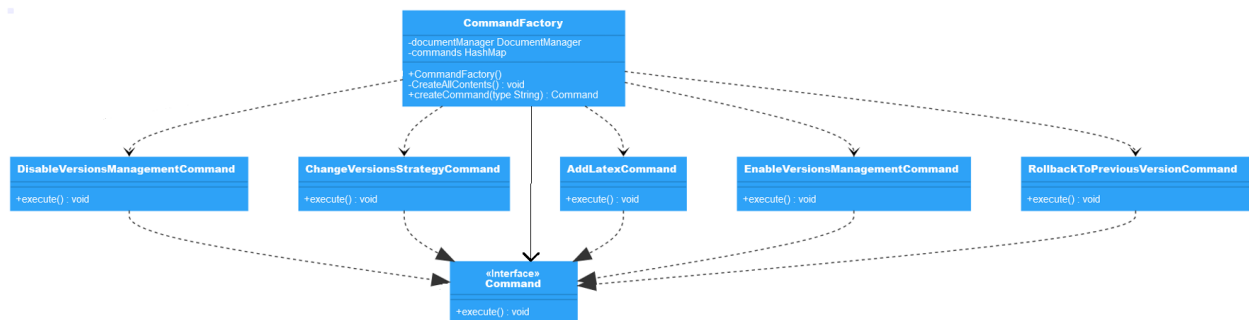


Figure 3: commands package part 1

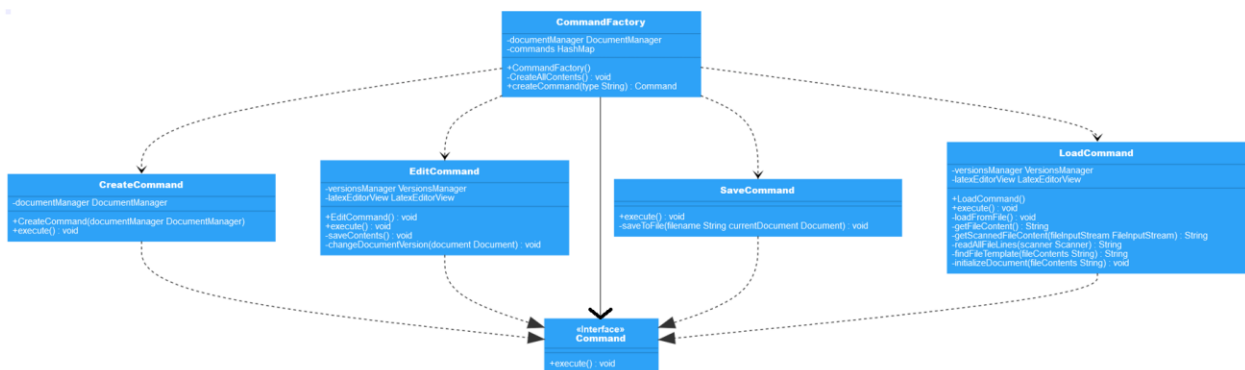


Figure 4: commands package part 2

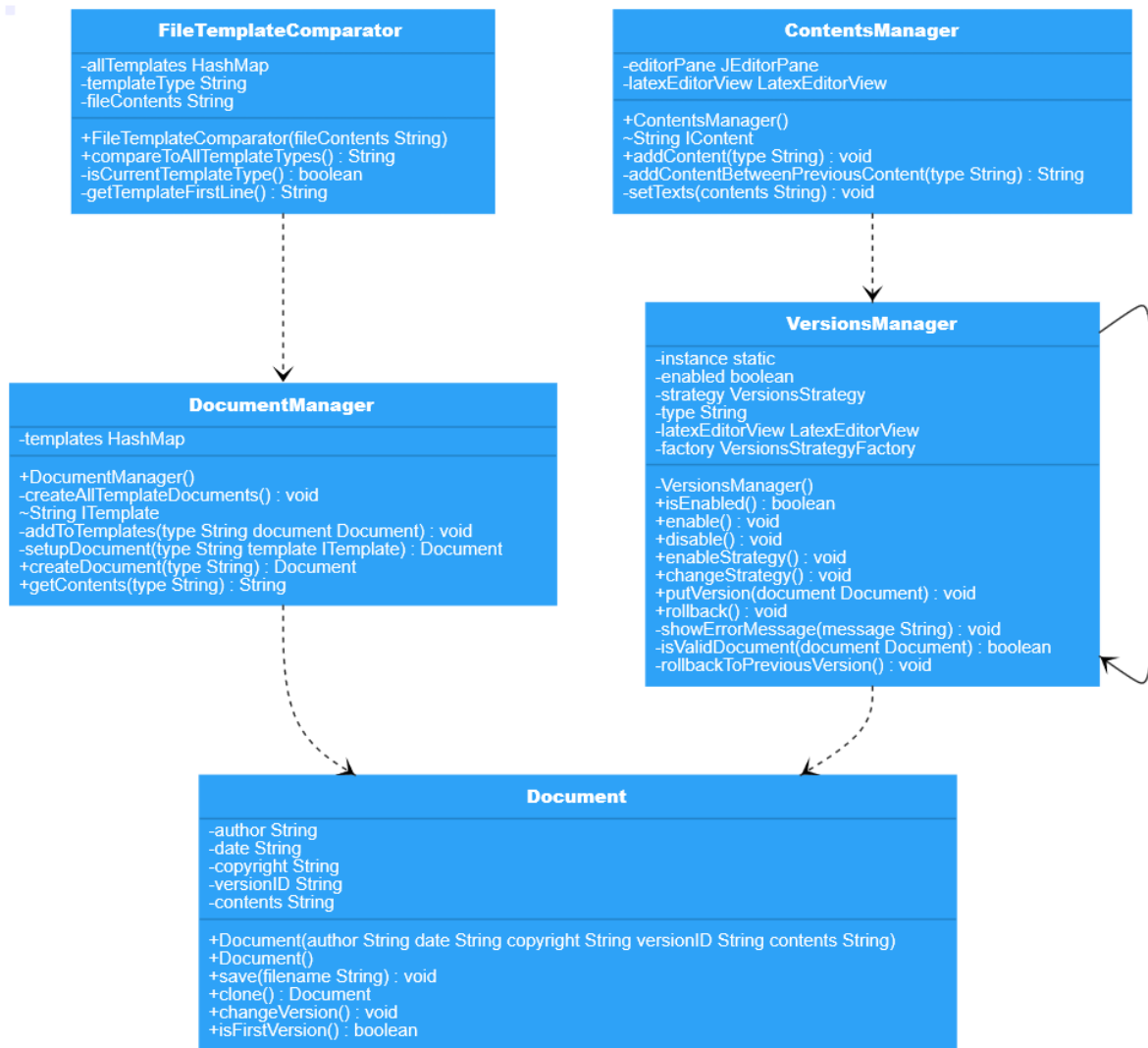


Figure 5: model package

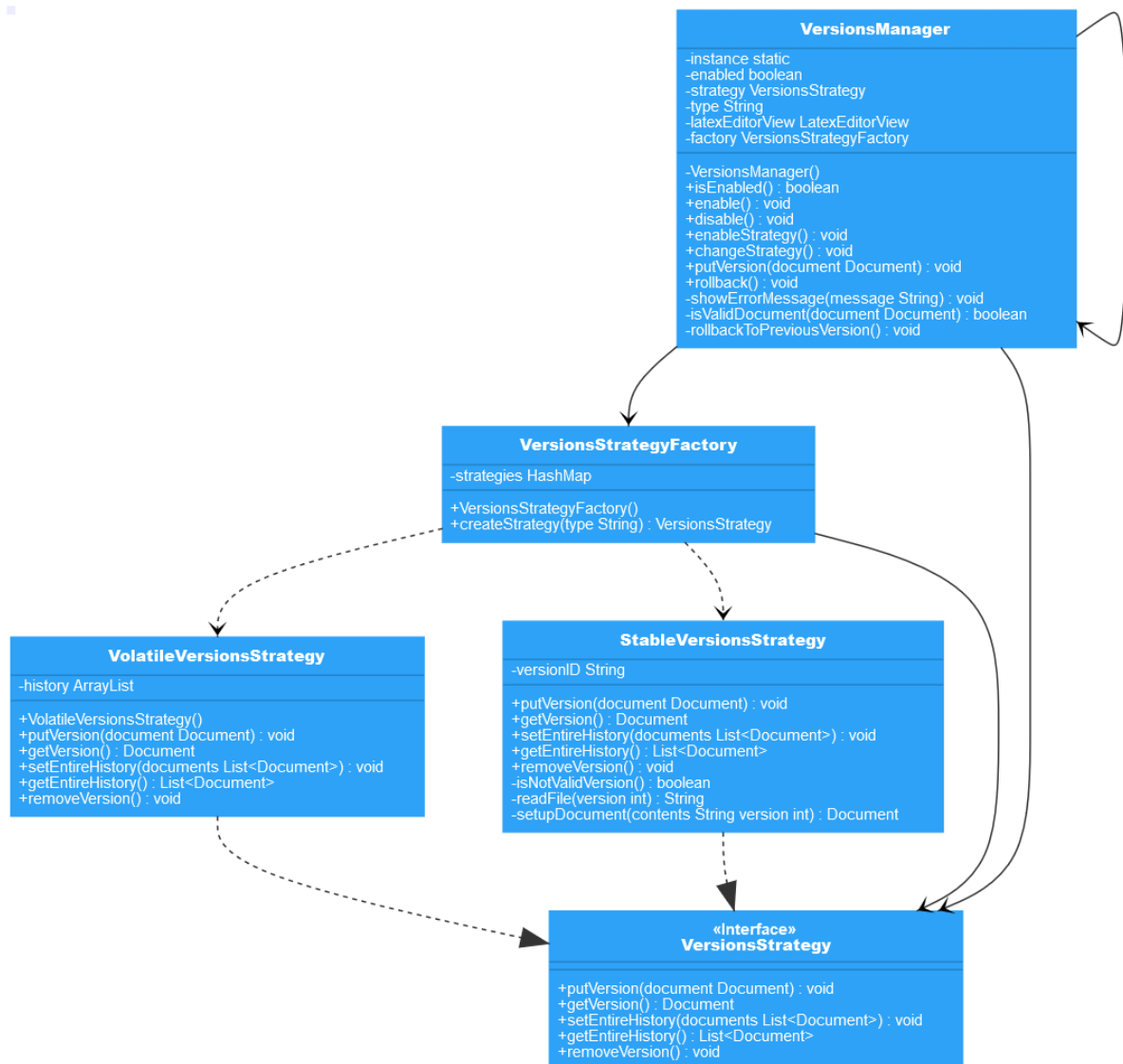


Figure 6: VersionsStrategy class & strategies package

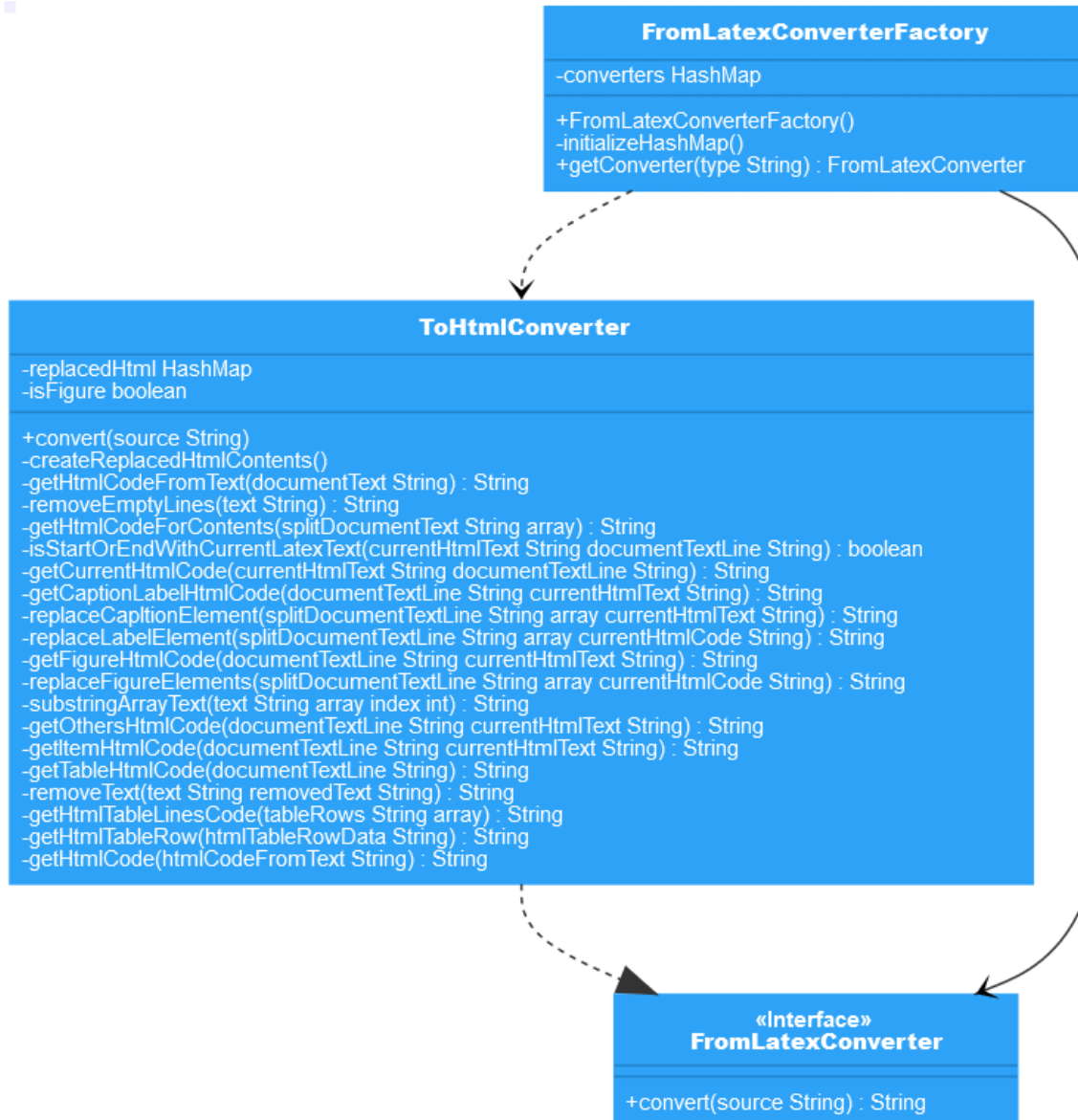


Figure 7: converters.fromlatex package



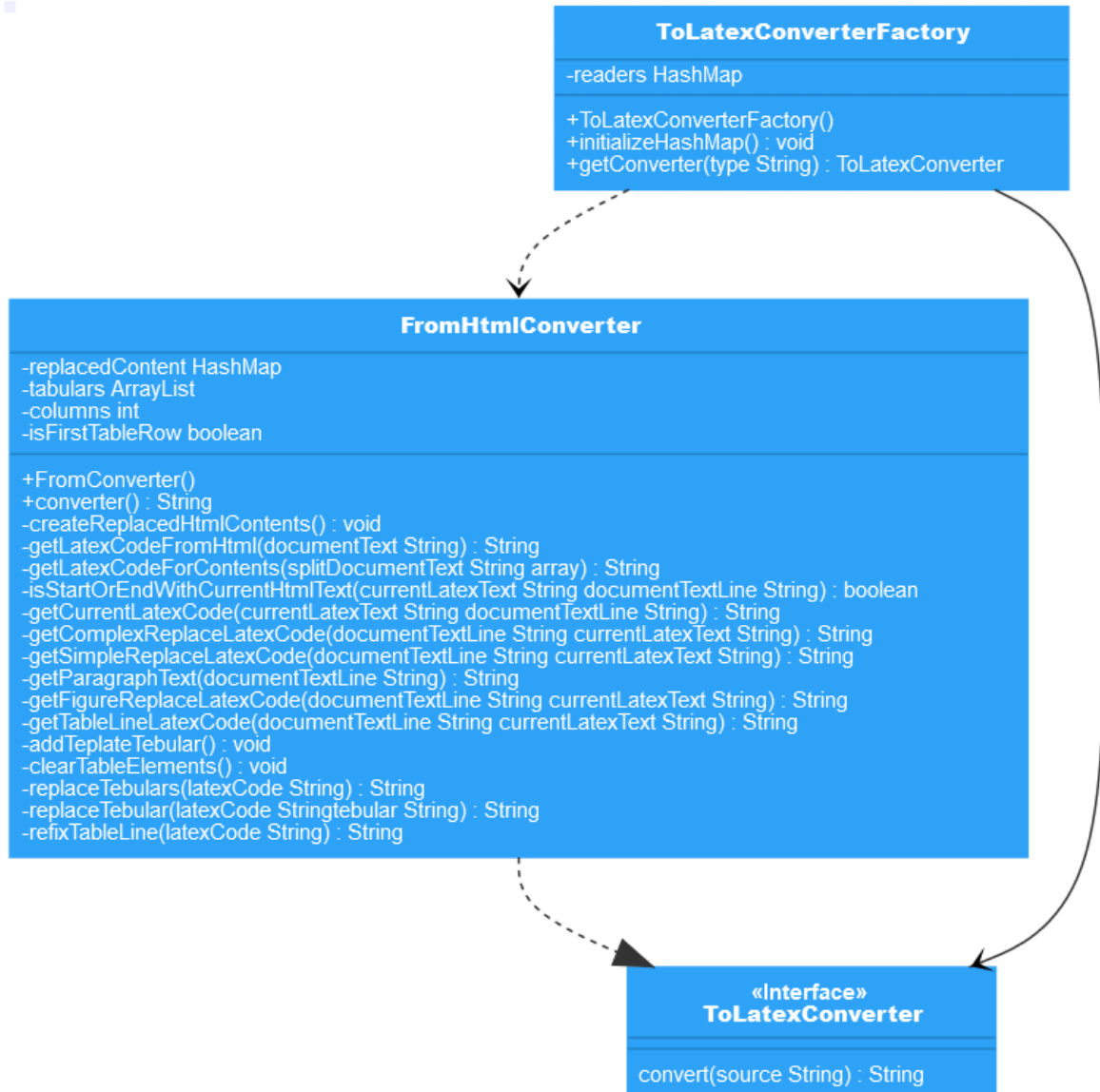


Figure 8: converters.tolatex package

## HOW EACH PROBLEM WAS ADDRESSED

1. LatexEditorController class had a lot of duplicate code that was addressed using the Substitute Algorithm refactoring, to make it easier to add new commands in the future by just adding it in one place, in a String array containing all the command elements.
2. Almost all the Command classes had a responsibility of being passed a VersionsManager object in their constructor and that created duplicate, unnecessary code. To address this, the VersionsManager class was implemented as a Singleton throughout the project, to provide a single point of access to the key objects used by the commands.
3. The getContents() method of the DocumentManager class had a lot of *if* statements that made its readability difficult. Once again, the Substitute Algorithm refactoring was used to lessen the struggle on the complexity of the method and put all the elements on a HashMap, making it easier to add new templates, if need arise.
4. As mentioned above, the VersionsManager class is the single point of access for most of the commands and other objects. That does not mean that this class must shoulder all the responsibilities of each connecting object. There existed methods outside the responsibility of the aforementioned class, that were implemented somewhere else in the project, such as saveContents() and loadFromFile(). These responsibilities did not reflect on the nature of the class as a VersionsManager but rather made it as a huge cluster of methods for no apparent reason. To address this issue, we removed various methods pertaining this problem, made a setter for the LatexEditorView object and removed any unnecessary method, that where useless and not used anywhere.

5. Same as the previous class, LatexEditorView has a lot of responsibilities. To better represent the intention given by the class name, a lot of variables were transferred to the LatexEditorController class to make them more accessible by the commands, because only they use them. Furthermore, the connection with VersionsManager was not needed anymore because it is now a Singleton and any field and method related to it was removed. Lastly, methods such saveContents() and loadFromFile() were moved to the corresponding commands. After these changes, the class focuses on the GUI aspect and connection than the model classes of the project.
6. MainWindow class had a Large Method that should have been a part of the application logic. One solution was to move it to the AddLatexCommand class but we preferred to make it a class of its own, the ContentsManager class. The purpose of this class is to make it easier to access the different types of contents and to be able to add more in the future, by storing them in a HashMap and providing a single entry point to get them. This new class is later used in the AddLatexCommand class.
7. Also other smaller refactorings were made in the whole project, where deemed necessary.

## IMPLEMENTATION

Class Name: OpeningWindow	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Display itself</u></li> <li>▪ <u>Create New Document</u></li> <li>▪ <u>Open Existing Document</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>ChooseTemplate</u></li> </ul>

Class Name: MainWindow	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Display itself</u></li> <li>▪ <u>Buttons to call each command</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>ChooseTemplate</u></li> </ul>

Class Name: ChooseTemplate	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Display itself</u></li> <li>▪ <u>Create File based on template</u></li> <li>▪ <u>Create Main Window</u></li> <li>▪ <u>Create Opening Window</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>MainWindow</u></li> <li>▪ <u>OpeningWindow</u></li> </ul>

Class Name: LatexEditorView	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Data holder for windows contents</u></li> <li>▪ <u>Contains current commands controller</u></li> <li>▪ <u>Contains current document</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Document</u></li> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>LatexEditorController</u></li> </ul>

Class Name: VersionsManager	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Change Versions Strategy</u></li> <li>▪ <u>Enable/disable Versions Strategy</u></li> <li>▪ <u>Store current document version</u></li> <li>▪ <u>Rollback to previous document version</u></li> <li>▪ <u>Provide singleton instance</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>VersionsStrategy &amp; subclasses</u></li> <li>▪ <u>Document</u></li> <li>▪ <u>VersionsManager</u></li> </ul>

Class Name: Document	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Hold document (meta)data</u></li> <li>▪ <u>Change contents &amp; versionID</u></li> <li>▪ <u>Save to File</u></li> <li>▪ <u>Create a copy of itself</u></li> </ul>	

Class Name: DocumentManager	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Create document</u></li> <li>▪ <u>Change it's contents based on template</u></li> <li>▪ <u>Return preset template content</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Document</u></li> </ul>

Class Name: ContentsManager	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Provide preset content based on type</u></li> <li>▪ <u>Add contents</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>LatexEditorView</u></li> </ul>

Class Name: FileTemplateComparator	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Determine the template type of given contents</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>DocumentManager</u></li> </ul>

Class Name: VersionsStrategy	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Interface for versions strategies</u></li> <li>▪ <u>Update current document version</u></li> <li>▪ <u>Get current document version</u></li> <li>▪ <u>Change current strategy's history</u></li> <li>▪ <u>Get document history</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Document</u></li> </ul>

<ul style="list-style-type: none"> <li>▪ <u>Remove a version</u></li> </ul>	
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Class Name: VolatileVersionsStrategy	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>All of the VersionsStrategy responsibilities with certain changes</u></li> <li>▪ <u>Store document in memory</u></li> <li>▪ <u>Get current version from memory</u></li> <li>▪ <u>Change entire history in memory</u></li> <li>▪ <u>Provide this history</u></li> <li>▪ <u>Remove a version</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Document</u></li> </ul>

Class Name: StableVersionsStrategy	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>All of the VersionsStrategy responsibilities with certain changes</u></li> <li>▪ <u>Store document in disk storage</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Document</u></li> </ul>



<ul style="list-style-type: none"> <li>▪ <u>Get current version from disk</u></li> <li>▪ <u>Change entire history in disk</u></li> <li>▪ <u>Get current version from disk (find file)</u></li> <li>▪ <u>Get all versions from disk</u></li> <li>▪ <u>Remove a version</u></li> </ul>	
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Class Name: VersionsStrategyFactory	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Create VersionsStrategy objects based on the specified type</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsStrategy</u></li> <li>▪ <u>VolatileVersionsStrategy</u></li> <li>▪ <u>StableVersionsStrategy</u></li> </ul>

Class Name: Command	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Interface for commands</u></li> <li>▪ <u>Execute this command</u></li> </ul>	

Class Name: LatexEditorController	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Enact specified command</u></li> <li>▪ <u>Data holder for fields needed by the commands.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Command</u></li> <li>▪ <u>CommandsFactory</u></li> </ul>

Class Name: CommandFactory	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Create command based on type</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Command</u></li> <li>▪ <u>AddLatexCommand</u></li> <li>▪ <u>ChangeVersionsStrategyCommand</u></li> <li>▪ <u>CreateCommand</u></li> <li>▪ <u>EnableVersionsManagementCommand</u></li> <li>▪ <u>DisableVersionsManagementCommand</u></li> <li>▪ <u>EditCommand</u></li> <li>▪ <u>SaveCommand</u></li> <li>▪ <u>LoadCommand</u></li> </ul>

	<ul style="list-style-type: none"> <li>▪ <u>RollbackToPreviousVersionCommand</u></li> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>DocumentManager</u></li> </ul>
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<b>Class Name: AddLatexCommand</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Adds new content to the current document</u></li> <li>▪ <u>Also saves it after</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>LatexEditorController</u></li> </ul>

<b>Class Name: ChangeVersionsStrategyCommand</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Change current VersionsStrategy</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> </ul>

<b>Class Name: CreateCommand</b>	
<b>Responsibilities</b>	<b>Collaborations</b>

<ul style="list-style-type: none"> <li>▪ <u>Create new document</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>LatexEditorController</u></li> <li>▪ <u>DocumentManager</u></li> <li>▪ <u>Document</u></li> </ul>
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<b>Class Name: EnableVersionsManagementCommand</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Enable versions management</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> </ul>

<b>Class Name: DisableVersionsManagementCommand</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Disable versions management</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> </ul>

<b>Class Name: EditCommand</b>	
<b>Responsibilities</b>	<b>Collaborations</b>

<ul style="list-style-type: none"> <li>▪ <u>Save current GUI contents to document</u></li> <li>▪ <u>Update versions history if enabled</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>LatexEditorController</u></li> <li>▪ <u>Document</u></li> </ul>
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Class Name: SaveCommand	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Save current version to a file</u></li> <li>▪ <u>Convert the contents to be saved to the specified format</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>LatexEditorController</u></li> <li>▪ <u>Document</u></li> <li>▪ <u>FromLatexConverterFactory</u></li> <li>▪ <u>FromLatexConverter</u></li> </ul>

Class Name: LoadCommand	
Responsibilities	Collaborations

<ul style="list-style-type: none"> <li>▪ <u>Load file depending on its format</u></li> <li>▪ <u>Convert loaded contents to Latex if needed</u></li> <li>▪ <u>Change current document as the loaded one</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> <li>▪ <u>LatexEditorView</u></li> <li>▪ <u>LatexEditorController</u></li> <li>▪ <u>Document</u></li> <li>▪ <u>ToLatexConverterFactory</u></li> <li>▪ <u>ToLatexConverter</u></li> <li>▪ <u>FileTemplateComparator</u></li> </ul>
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Class Name: RollbackToPreviousVersionCommand	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Update current version to the previous one</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>VersionsManager</u></li> </ul>

Class Name: ToLatexConverter	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>Interface for loading converters</u></li> <li>▪ <u>Return a converted to Latex string</u></li> </ul>	

<b>Class Name: ToLatexConverterFactory</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Create loading converter based on type</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>ToLatexConverter</u></li> </ul>

<b>Class Name: FromHtmlConverter</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Convert the given Latex string to html</u></li> </ul>	

<b>Class Name: FromLatexConverter</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
<ul style="list-style-type: none"> <li>▪ <u>Interface for saving converters</u></li> <li>▪ <u>Return a converted latex string to the specified type</u></li> </ul>	

<b>Class Name: FromLatexConverterFactory</b>	
<b>Responsibilities</b>	<b>Collaborations</b>

▪ <u>Create saving converter based on type</u>	▪ <u>FromLatexConverter</u>
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<b>Class Name: ToHtmlConverter</b>	
<b>Responsibilities</b>	<b>Collaborations</b>
▪ <u>Convert the given Latex string to html</u>	