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<ASSESSMENT>

# PROGRAM UNDERSTANDING & REVERSE ENGINEERING

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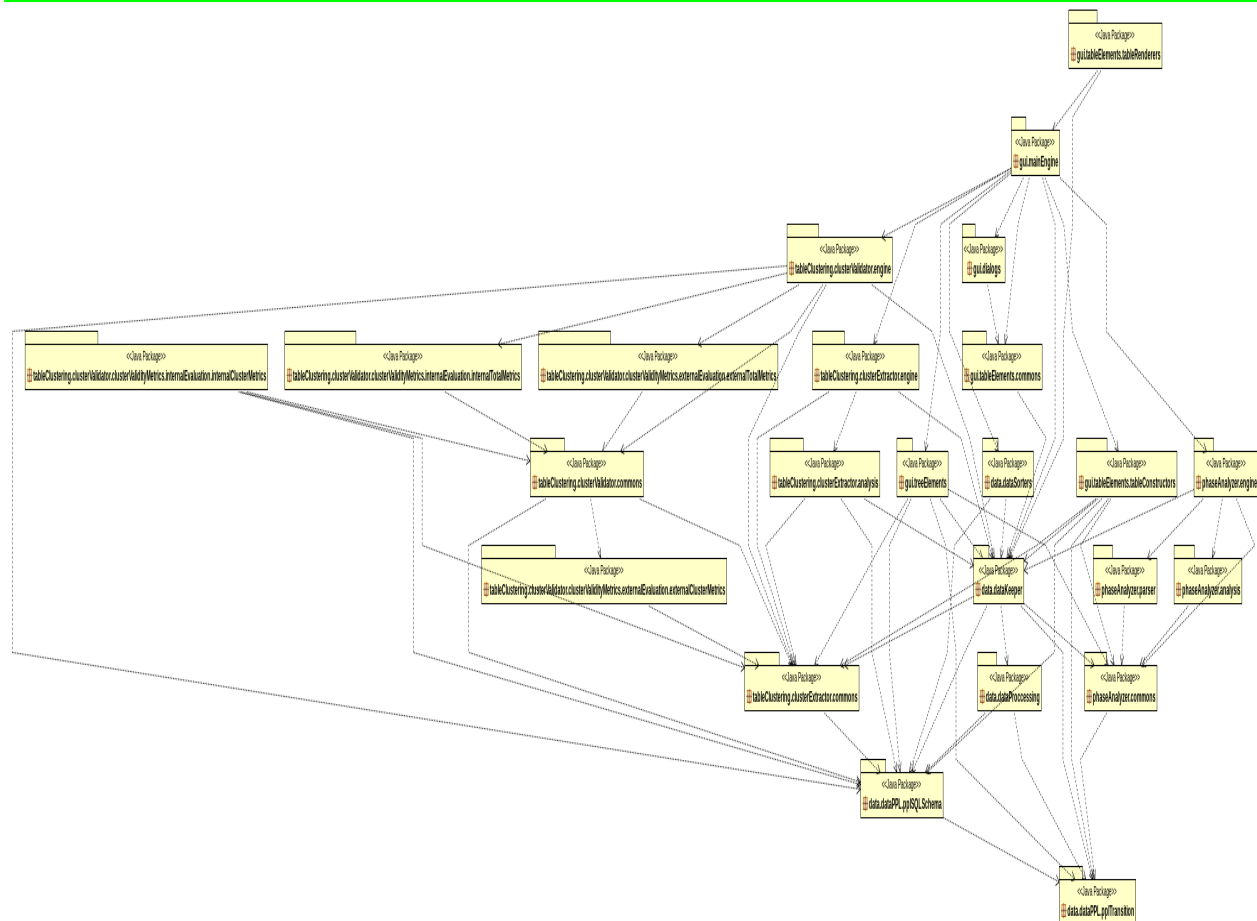
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## INTRODUCTION

The objectives of this phase is to comprehend the functionality of the project having in mind the way that each class works. Also we have to understand how the classes function and how exactly they connect with each other to create the final result. We must be able to identify the errors within the code and take meaning of why they exist.

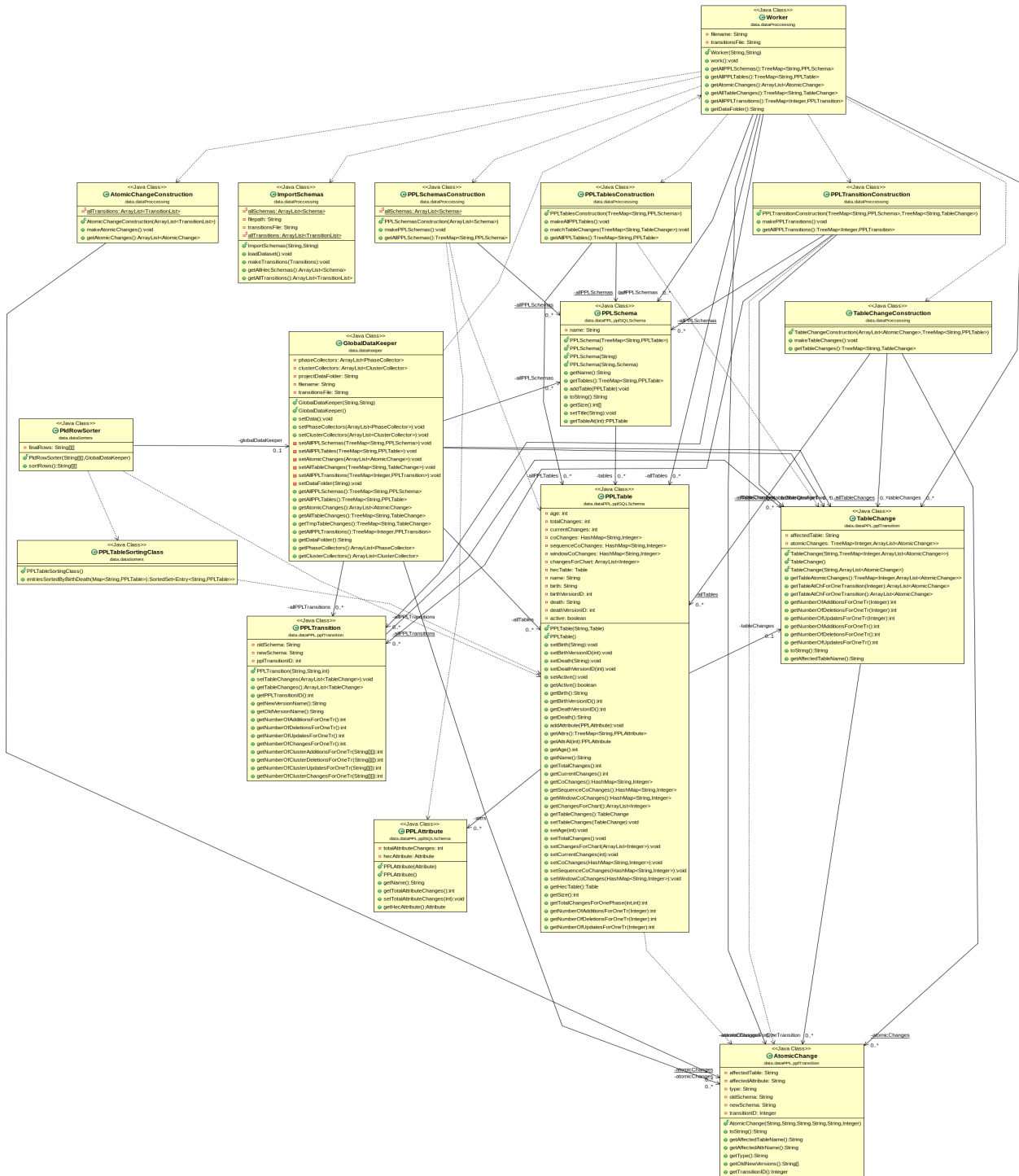
## DESIGN RECOVERY

## PACKAGE DIAGRAM

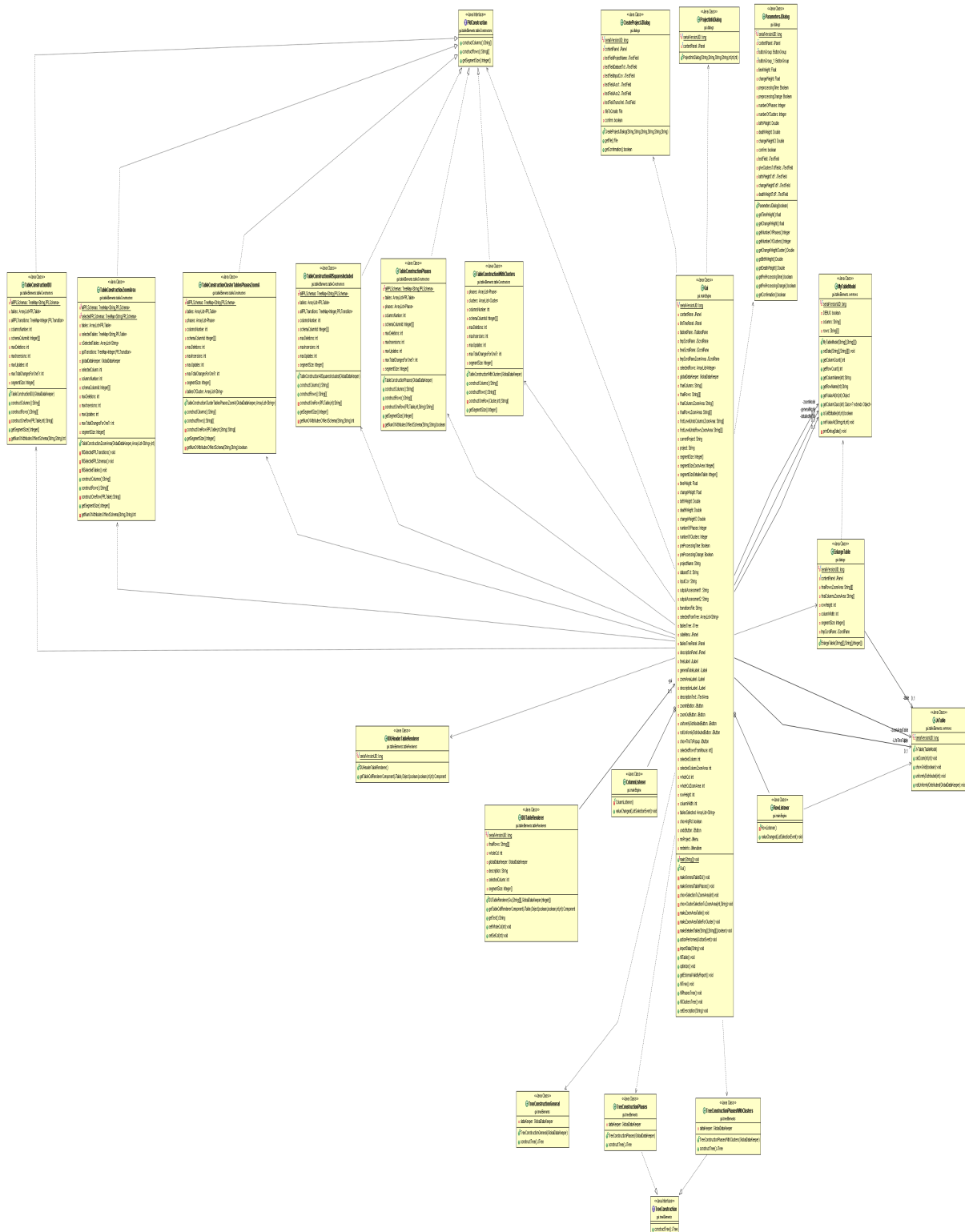


## CLASS DIAGRAMS

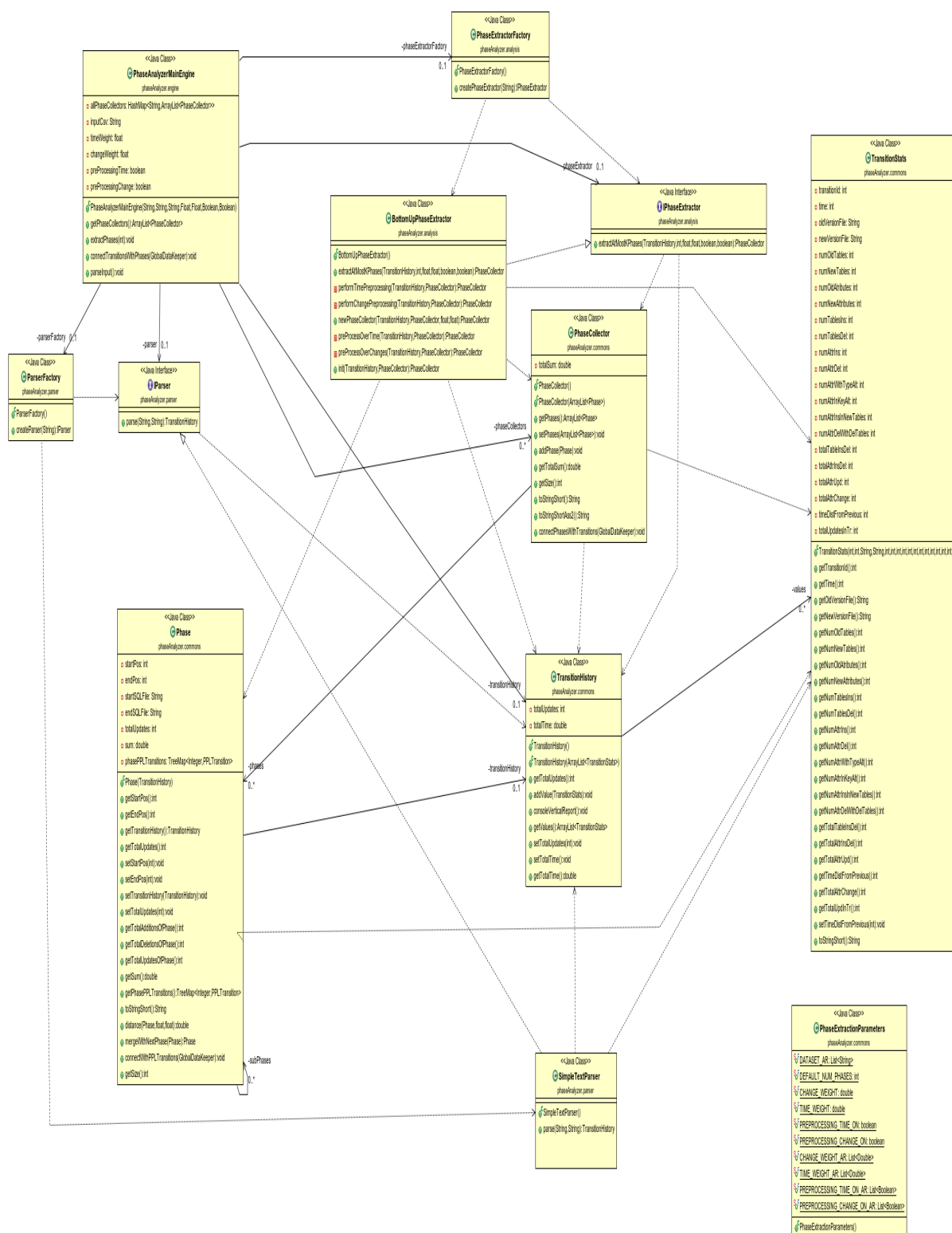
### 1) Data Class Diagram:



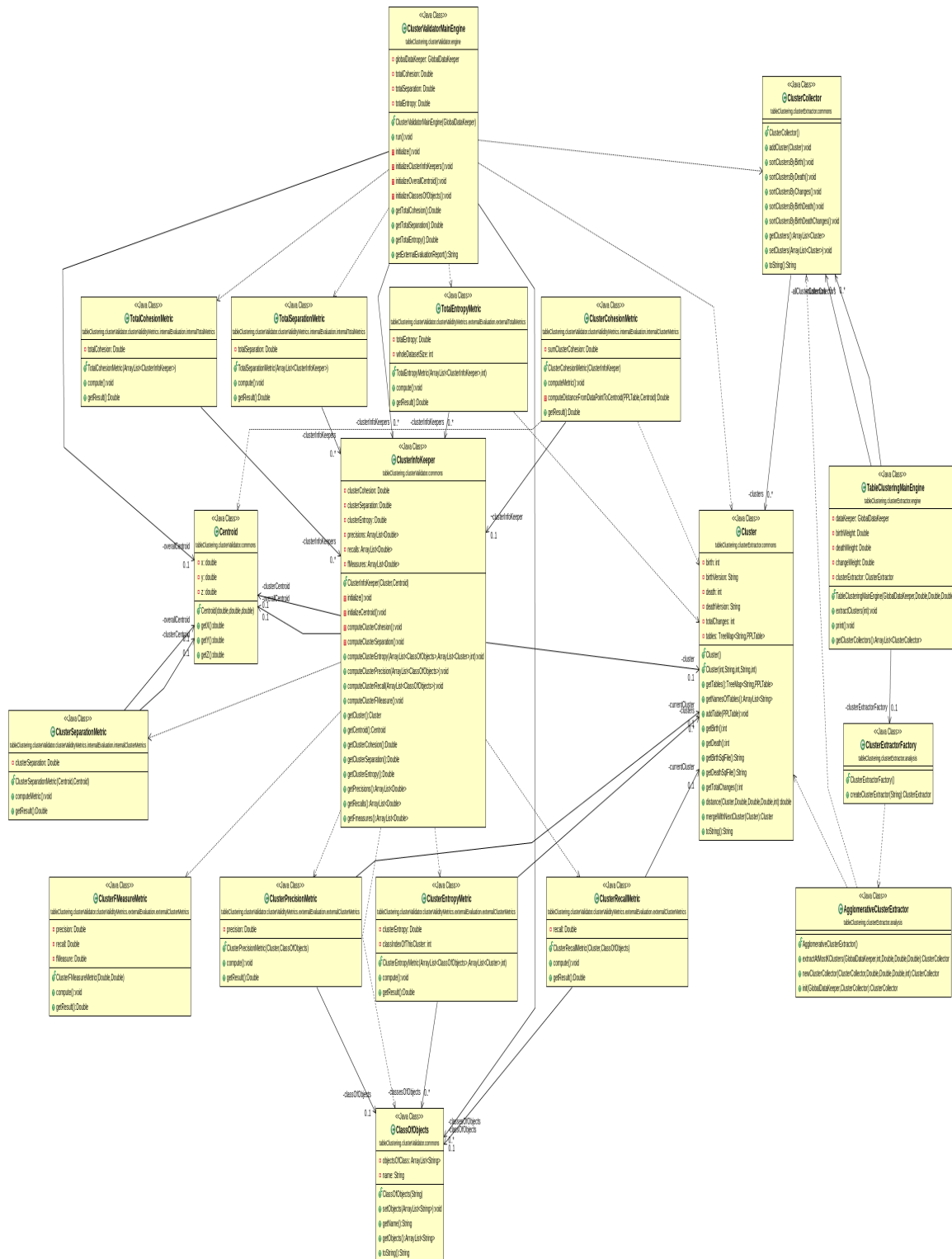
## 2) Gui Class Diagram:



### 3) Phase Class Diagram:



#### 4) Tables Class Diagram:



Class Name: GlobalDataKeeper	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>It gathers and distributes the application's data to all the classes.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Worker</u></li> <li>▪ <u>PldRowSorter</u></li> <li>▪ <u>PPLSchema</u></li> <li>▪ <u>TableChange</u></li> <li>▪ <u>PPLTable</u></li> <li>▪ <u>AtomicChange</u></li> <li>▪ <u>PPLTrnasition</u></li> </ul>

Class Name: PPLAttribue	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>It's an object that stores a PPL's attribute and it's changes.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>PPLChemasConstruction</u></li> <li>▪ <u>PPLTable</u></li> </ul>



Class Name: PPLSchema	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>This class stores PPL's schema, which contains the tables and a name for each table.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Worker</u></li> <li>▪ <u>GlobalDataKeeper</u></li> <li>▪ <u>PPLSchemasConstruction</u></li> <li>▪ <u>PPLTablesConstruction</u></li> <li>▪ <u>PPLTrnasitionConstruction</u></li> <li>▪ <u>PPLTable</u></li> </ul>

Class Name: PPLTable	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>This class contains all the information about a PPL Table.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>GlobalDataKeeper</u></li> <li>▪ <u>PldRowSorter</u></li> <li>▪ <u>PPLTableSortingClass</u></li> <li>▪ <u>PPLAttribute</u></li> <li>▪ <u>AtomicChange</u></li> <li>▪ <u>TableChange</u></li> </ul>

	<ul style="list-style-type: none"> <li>▪ <u>TableChangeConstruction</u></li> <li>▪ <u>Worker</u></li> <li>▪ <u>PPLSchema</u></li> <li>▪ <u>PPLTablesConstruction</u></li> <li>▪ <u>PPLSchemasConstruction</u></li> </ul>
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Class Name: AtomicChange	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>This class holds information about a single(atomic) change on a tables as well as every affected component from this change.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>AtomicChangeConstruction</u></li> <li>▪ <u>GlobalDataKeeper</u></li> <li>▪ <u>PPLTable</u></li> <li>▪ <u>Worker</u></li> <li>▪ <u>PPLTransitionConstruction</u></li> <li>▪ <u>TableChange</u></li> <li>▪ <u>TableChangeConstruction</u></li> </ul>

Class Name: PPLTransition	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ <u>This class holds the information of Schema changes.</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>GlobalDataKeeper</u></li> <li>▪ <u>Worker</u></li> <li>▪ <u>TableChange</u></li> <li>▪ <u>PPLTransitionConstruction</u></li> </ul>

Class Name: TableChange	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This class holds the information of a complete table change, i.e. all the atomic changes that happen on a table on an update.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>PPLTransitionConstruction</u></li> <li>▪ <u>PPLTransition</u></li> <li>▪ <u>PPLTable</u></li> <li>▪ <u>AtomicChange</u></li> <li>▪ <u>Worker</u></li> <li>▪ <u>TableChangeConstruction</u></li> <li>▪ <u>GlobalDataKeeper</u></li> <li>▪ <u>PPLTablesConstruction</u></li> </ul>

Class Name: AtomicChangeConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class constructs all atomic changes needed to be done in order to complete all transitions in a table.</li> </ul>	<ul style="list-style-type: none"> <li><u>Worker</u></li> <li><u>AtomicChange</u></li> </ul>

Class Name: ImportSchemas	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class imports schemas from transition files.two existing CVs</li> </ul>	<ul style="list-style-type: none"> <li><u>Worker</u></li> </ul>

Class Name: PPLSchemasConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class constructs and holds all the schemas.</li> </ul>	<ul style="list-style-type: none"> <li><u>Worker</u></li> <li><u>PPLAttribute</u></li> <li><u>PPLTable</u></li> <li><u>PPLSchema</u></li> </ul>

Class Name: PPLTablesConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class constructs and holds all the tables AND all the schemas.</li> </ul>	<ul style="list-style-type: none"> <li><u>Worker</u></li> <li><u>PPLTable</u></li> <li><u>PPLSchema</u></li> <li><u>TableChange</u></li> </ul>

Class Name: PPLTransitionConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class does all transitions and holds all the transitions AND schemas AND table changes.</li> </ul>	<ul style="list-style-type: none"> <li><u>Worker</u></li> <li><u>PPLSchema</u></li> <li><u>PPLTransition</u></li> <li><u>AtomicChange</u></li> <li><u>TableChange</u></li> </ul>

Class Name: Worker	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class uses all contruction classes to import all schemas, tables, atomic changes, table changes and transitions. It holds all these data.</li> </ul>	<ul style="list-style-type: none"> <li><u>AtomicChangeConstruction</u></li> <li><u>ImportSchemas</u></li> <li><u>PPLSchemasConstruction</u></li> <li><u>GlobalDataKeeper</u></li> <li><u>PPLTablesConstruction</u></li> <li><u>PPLSchema</u></li> <li><u>AtomicChange</u></li> <li><u>PPLTable</u></li> <li><u>PPLTransition</u></li> <li><u>PPLTransitionConstruction</u></li> <li><u>TableChangeConstruction</u></li> <li><u>TableChange</u></li> </ul>

Class Name: TableChangeConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class constructs all table changes and holds all atomic changes AND table changes AND all tables.</li> </ul>	<ul style="list-style-type: none"> <li><u>Worker</u></li> <li><u>PPLTable</u></li> <li><u>TableChange</u></li> <li><u>AtomicChange</u></li> </ul>

Class Name: PldRowSorter	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class sorts all tables by birth death.</li> </ul>	<ul style="list-style-type: none"> <li><u>PPLTableSortingClass</u></li> <li><u>PPLTable</u></li> <li><u>GlobalDataKeeper</u></li> </ul>

Class Name: PPLTableSortingClass	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class sorts all tables by birth death attribute.</li> </ul>	<ul style="list-style-type: none"> <li><u>PldRowSorter</u></li> <li><u>PPLTable</u></li> </ul>

Class Name: CreateProjectJDialog	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates the project dialog.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> </ul>

Class Name: EnlargeTable	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class enlarges a table.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> <li><u>MyTableModel</u></li> <li><u>JvTable</u></li> </ul>



Class Name: ParametersJDialog	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>.This class creates the parameter dialog.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> </ul>

Class Name: ProjectInfoDialog	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>.This class creates the project information dialog.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> </ul>

Class Name: Gui	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates the application's main window and handles all the logic that is happening on it.</li> </ul>	<ul style="list-style-type: none"> <li><u>CreateProjectJDialog</u></li> <li><u>ProjectInfoDialog</u></li> </ul>

	<ul style="list-style-type: none"> <li>▪ <a href="#"><u>ParametersDialog</u></a></li> <li>▪ <a href="#"><u>PldConstruction</u></a></li> <li>▪ <a href="#"><u>TableConstructionWithClusters</u></a></li> <li>▪ <a href="#"><u>TableConstructionPhases</u></a></li> <li>▪ <a href="#"><u>TableConstructionAllSquaresIncluded</u></a></li> <li>▪ <a href="#"><u>TableConstructionClusterTablesPhasesZoomA</u></a></li> <li>▪ <a href="#"><u>TableConstructionZoomArea</u></a></li> <li>▪ <a href="#"><u>TableConstructionIDU</u></a></li> <li>▪ <a href="#"><u>IDUHeaderTableRenderer</u></a></li> <li>▪ <a href="#"><u>IDUTableRenderer</u></a></li> <li>▪ <a href="#"><u>ColumnListener</u></a></li> <li>▪ <a href="#"><u>TreeConstructionGeneral</u></a></li> <li>▪ <a href="#"><u>TreeConstructionPhases</u></a></li> <li>▪ <a href="#"><u>TreeConstructionPhasesWithClusters</u></a></li> <li>▪ <a href="#"><u>RowListener</u></a></li> </ul>
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	<ul style="list-style-type: none"> <li>▪ <u>JvTable</u></li> <li>▪ <u>EnlargeTable</u></li> <li>▪ <u>MyTableModel</u></li> </ul>
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Class Name: JvTable	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This class creates the a table given a model tables and handles the zoom.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Gui</u></li> <li>▪ <u>RowListener</u></li> <li>▪ <u>EnlargeTable</u></li> </ul>

Class Name: MyTableModel	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This class holds the data of a table model.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Gui</u></li> <li>▪ <u>EnlargeTable</u></li> </ul>

Class Name: PldConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>.This interface defines the constructColumns, constructRows and getSegmentSize methods for the table constructors.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> <li><u>TableConstructionIDU</u></li> <li><u>TableConstructionZoomArea</u></li> <li><u>TableConstructionClusterTables</u> <u>PhasesZoomA</u></li> <li><u>TableConstructionAllSquaresIncluded</u></li> <li><u>TableConstructionPhases</u></li> <li><u>TableConstructionWithClusters</u></li> </ul>

Class Name: TableConstructionAllSquaresIncluded	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>.This class constructs a table with all the squares.</li> </ul>	<ul style="list-style-type: none"> <li><u>PldConstruction</u></li> <li><u>Gui</u></li> </ul>

Class Name: TableConstructionClusterTablesPhasesZoomA	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates a table of cluster table phases with zoom A.</li> </ul>	<ul style="list-style-type: none"> <li><u>PldConstruction</u></li> <li><u>Gui</u></li> </ul>

Class Name: TableConstructionIDU	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates a table IDU.</li> </ul>	<ul style="list-style-type: none"> <li><u>PldConstruction</u></li> <li><u>Gui</u></li> </ul>

Class Name: TableConstructionPhases	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates a table of phases.</li> </ul>	<ul style="list-style-type: none"> <li><u>PldConstruction</u></li> <li><u>Gui</u></li> </ul>

Class Name: TableConstructionWithClusters	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ .This class creates a table with clusters.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>PldConstruction</u></li> <li>▪ <u>Gui</u></li> </ul>

Class Name: TableConstructionZoomArea	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This class creates a table with the selected zoom area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>PldConstruction</u></li> <li>▪ <u>Gui</u></li> </ul>

Class Name: IDUHeaderTableRenderer	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This class creates the renderer for the header of IDU table.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Gui</u></li> </ul>

Class Name: IDUTableRenderer	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates the renderer for the IDU table.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> </ul>

Class Name: TreeConstruction	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This interface defines the constructTree method for the tree constructors.</li> </ul>	<ul style="list-style-type: none"> <li><u>TreeConstructionPhases</u></li> <li><u>TreeConstructionPhasesWithClusters</u></li> </ul>

Class Name: TreeConstructionGeneral	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates a tree.</li> </ul>	<ul style="list-style-type: none"> <li><u>Gui</u></li> </ul>

Class Name: TreeConstructionPhases	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates a tree of phases.</li> </ul>	<ul style="list-style-type: none"> <li><u>TreeConstruction</u></li> <li><u>Gui</u></li> </ul>

Class Name: TreeConstructionPhasesWithClusters	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class creates a tree of phases with clusters.</li> </ul>	<ul style="list-style-type: none"> <li><u>TreeConstruction</u></li> <li><u>Gui</u></li> </ul>

Class Name: BottomUpPhaseExtractor	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class does some processes to extract Phases.</li> </ul>	<ul style="list-style-type: none"> <li><u>PhaseExtractorFactory</u></li> <li><u>IPhaseExtractor</u></li> </ul>



	<ul style="list-style-type: none"> <li>▪ <u>TransitionStats</u></li> <li>▪ <u>TransitionHistory</u></li> <li>▪ <u>Phase</u></li> </ul>
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Class Name: <b>IPhaseExtractor</b>	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This is an interface that defines the phase extraction method.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>PhaseAnalyzerMainEngine</u></li> <li>▪ <u>PhaseExtractorFactory</u></li> <li>▪ <u>BottomUpPhaseExtractor</u></li> <li>▪ <u>PhaseCollector</u></li> <li>▪ <u>TransitionHistory</u></li> </ul>

Class Name: <b>PhaseExtractorFactory</b>	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This is a factory class that creates a phase extractor.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>PhaseAnalyzerMainEngine</u></li> <li>▪ <u>BottomUpPhaseExtractor</u></li> <li>▪ <u>IPhaseExtractor</u></li> </ul>

Class Name: Phase	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the data of a phase.</li> </ul>	<ul style="list-style-type: none"> <li><u>BottomUpPhaseExtractor</u></li> <li><u>PhaseCollector</u></li> <li><u>TransitionHistory</u></li> <li><u>TransitionStats</u></li> </ul>

Class Name: PhaseCollector	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class collects and holds all phases.</li> </ul>	<ul style="list-style-type: none"> <li><u>IphaseExtractor</u></li> <li><u>TransitionStats</u></li> <li><u>TransitionHistory</u></li> <li><u>Phase</u></li> <li><u>PhaseAnalyzerMainEngine</u></li> <li><u>BottomUpPhaseExtractor</u></li> </ul>

Class Name: PhaseExtractionParameters	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the parameters for the phase extraction.</li> </ul>	

Class Name: TransitionHistory	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the history of all transitions.</li> </ul>	<ul style="list-style-type: none"> <li><u>IphaseExtractor</u></li> <li><u>PhaseCollector</u></li> <li><u>BottomUpPhaseExtractor</u></li> <li><u>PhaseAnalyzerMainEngine</u></li> <li><u>Iparser</u></li> <li><u>Phase</u></li> <li><u>SimpleTextParser</u></li> <li><u>TransitionStats</u></li> </ul>

Class Name: TrnasitionStats	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the stats of all transitions.</li> </ul>	<ul style="list-style-type: none"> <li><u>BottomUpPhaseExtractor</u></li> <li><u>PhaseCollector</u></li> <li><u>TransitionHistory</u></li> <li><u>Phase</u></li> <li><u>SimpleTextParser</u></li> </ul>

Class Name: PhaseAnalyzerMainEngine	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class calls the builder to start the phase extraction and the transition history.</li> </ul>	<ul style="list-style-type: none"> <li><u>PhaseExtractorFactoy</u></li> <li><u>IPhaseExtractor</u></li> <li><u>PhaseCollector</u></li> <li><u>TransitionHistory</u></li> <li><u>ParserFactory</u></li> <li><u>IParser</u></li> </ul>

Class Name: IParser	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This is an interface that defines the parse method.</li> </ul>	<ul style="list-style-type: none"> <li><u>PhaseAnalyzerMainEngine</u></li> <li><u>ParserFactory</u></li> <li><u>Ipaser</u></li> <li><u>SimpleTextParser</u></li> <li><u>TransitionHistory</u></li> </ul>

Class Name: ParserFactory	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This is factory class that creates a simple text parser.</li> </ul>	<ul style="list-style-type: none"> <li><u>PhaseAnalyzerMainEngine</u></li> <li><u>IParser</u></li> <li><u>SimpleTextParser</u></li> </ul>

Class Name: SimpleTextParser	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class parses a file and creates the transition history.</li> </ul>	<ul style="list-style-type: none"> <li><u>ParserFactory</u></li> <li><u>TransitionHistory</u></li> <li><u>TransitionStats</u></li> </ul>

Class Name: AgglomerativeClusterExtractor	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class extracts clusters with the agglomerative method.</li> </ul>	<ul style="list-style-type: none"> <li><u>Cluster</u></li> <li><u>ClusterExtractorFactory</u></li> </ul>

Class Name: ClusterExtractor	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This interface defines the cluster extractor method.</li> </ul>	<ul style="list-style-type: none"> <li><u>TableClusteringMainEngine</u></li> <li><u>ClusterCollector</u></li> </ul>

Class Name: ClusterExtractorFactory	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This is a factory class that creates an agglomerative cluster extractor.</li> </ul>	<ul style="list-style-type: none"> <li><u>TableClusteringMainEngine</u></li> <li><u>AgglomerativeClusterExtractor</u></li> </ul>

Class Name: Cluster	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the data of a cluster.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterCollector</u></li> <li><u>ClusterValidatorMainEngine</u></li> <li><u>ClusterCohesionMetric</u></li> <li><u>TotalEntropyMetric</u></li> <li><u>ClusterInfoKeeper</u></li> <li><u>ClusterPrecisionMetric</u></li> <li><u>ClusterEntropyMetric</u></li> <li><u>ClusterRecallMetric</u></li> <li><u>AgglomerativeClusterExtractor</u></li> </ul>

Class Name: ClusterCollector	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the data of all clusters.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> <li><u>Cluster</u></li> <li><u>AgglomerativeClusterExtractor</u></li> <li><u>TableClusteringMainEngine</u></li> </ul>

Class Name: TableClusteringMainEngine	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the parameters of the clustering and calls the extractor.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterCollector</u></li> <li><u>ClusterExtractorFactory</u></li> </ul>



Class Name: ClusterEntropyMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the entropy metric of clusters.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterInfoKeeper</u></li> <li><u>ClassOfObjects</u></li> </ul>

Class Name: ClusterFMeasureMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the f-measure metric.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: ClusterPrecisionMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the precision metric of a cluster.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterInfoKeeper</u></li> <li><u>Cluster</u></li> <li><u>ClassOfObjects</u></li> </ul>

Class Name: ClusterRecallMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the recall metric of a cluster.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterInfoMetric</u></li> <li><u>Cluster</u></li> <li><u>ClassOfObjects</u></li> </ul>

Class Name: ExternalClusterMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This interface defines the compute and get result methods for the cluster metrics.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: ExternalTotalMetrics	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This interface defines the compute and getResult methods of the total metrics.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> </ul>

Class Name: TotalEntropyMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the entropy of the clustering.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: ClusterCohesionMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the cohesion metric of a cluster.</li> </ul>	<ul style="list-style-type: none"> <li><u>Cluster</u></li> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: ClusterSeparationMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the separation metrics of centroids.</li> </ul>	<ul style="list-style-type: none"> <li><u>Centroid</u></li> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: InternalClusterMetrics	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This interface defines computeMetric and getResult methods for the cluster metrics.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: InternalTotalMetrics	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This interface defines the compute and getResult method for the total metrics of clusters.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> </ul>

Class Name: TotalCohesionMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the total cohesion metric of clusters.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: TotalSeparationMetric	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class computes the total separation metric of clusters.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: Centroid	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the data of a centroid.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorrainEngine</u></li> <li><u>ClusterInfoKeeper</u></li> </ul>

Class Name: ClassOfObjects	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>▪ This class holds objects of a class.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>ClusterValidatorainEngine</u></li> <li>▪ <u>ClusterInfoKeeper</u></li> <li>▪ <u>ClusterPrecisionMetric</u></li> <li>▪ <u>ClusterEntropyMetric</u></li> <li>▪ <u>ClusterRecallMetric</u></li> </ul>

Class Name: ClusterInfoKeeper	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class holds the informations of a cluster.</li> </ul>	<ul style="list-style-type: none"> <li><u>ClusterValidatorMainEngine</u></li> <li><u>TotalCohesionMetric</u></li> <li><u>TotalSeparationMetric</u></li> <li><u>TotalEntropyMetric</u></li> <li><u>ClusterCohesionMetric</u></li> <li><u>Cluster</u></li> <li><u>ClusterRecallMetric</u></li> <li><u>ClusterEntropyMetric</u></li> <li><u>ClassOfObjects</u></li> <li><u>ClusterPrecisionMetric</u></li> <li><u>ClusterFMeasureMetric</u></li> <li><u>ClusteSeparationMetric</u></li> <li><u>Centroid</u></li> </ul>

Class Name: ClusterValidatorMainEngine	
Responsibilities	Collaborations
<ul style="list-style-type: none"> <li>This class calls all the classes that calculate metrics to evaluate the clustering.</li> </ul>	<ul style="list-style-type: none"> <li><u>Centroid</u></li> <li><u>TotalCohesionMetric</u></li> <li><u>TotalSeparationMetric</u></li> <li><u>ClusterInfoKeeper</u></li> <li><u>TotalEntropyMetric</u></li> <li><u>ClassOfObjects</u></li> <li><u>Cluster</u></li> <li><u>ClusterCollector</u></li> </ul>