ImplicationsModel

<<Property>> -nodes : Integer
<<Property>> -implications : Integer
<<Property>> -maxPremiseLength : Integer
<<Property>> -minPremiseLength : Integer
<<Property>> -maxConclusionLength : Integer
<<Property>> -minConclusionLength : Integer
<<Property>> -showImage : Boolean
<<Property>> -num : Integer
-systemCreated : BooleanProperty
-output : StringProperty
<<Property>> -nodeType : AttributeType

+ImplicationsModel()
+ImplicationsModel(nodes : Integer, implications : Integer)
+outputProperty() : StringProperty
+getOutput() : String
+systemCreatedProperty() : BooleanProperty
+isSystemCreated() : Boolean
+validate() : ResultModelValidation
+clean() : void

ImplicationsController

-model : ImplicationsModel
-validationSupport : ValidationSupport
-logger : Logger = Logger.getLogger(ImplicationsController.class.getName())
-txtNodes : TextField
-txtImplications : TextField
-txtMinLongPremise : TextField
-txtMaxLongPremise : TextField
-txtMinLongConclusion : TextField
-txtMaxLongConclusion : TextField
-btnSave : Button
-btnGenerate : Button
-cbNodeType : ComboBox
-txtSystemsNumber : TextField
-textViewer : TextArea
-txtOutput : TextField
-implicationsPane : AnchorPane
-generationProgressInd : ProgressIndicator
-nodeType : AttributeType
-implicationsSystems : List<ImplicationalSystem>

#initView() : void
#initModel() : void
#initValidation() : void
#initListeners() : void
#save() : void
#showSaveDialog() : File
#showText(system : ImplicationalSystem) : void
#showText(implicationsFile : File) : void
#validate() : void
#viewToModel() : void
#cleanView() : void
#cleanModel() : void
#initBinding() : void
#publicSystemsGenerated()selectedFile : String) : void
+initialize(url : URL, rb : ResourceBundle) : void
+setOutput(outputPath : String) : void
+handleNodeTypeSelection(event : ActionEvent) : void
+handlePremiseSizeChange() : void
+handleConclusionSizeChange() : void
+handleGenerateButton(event : ActionEvent) : void
+handleOutputAction(event : ActionEvent) : void
+handleSaveButton(event : ActionEvent) : void
+clean(event : ActionEvent) : void
+implicationsGenerated(systems : List<ImplicationalSystem>) : void

<<viewpoint>>
implications.fxml

-txtNodes : TextField
-txtImplications : TextField
-txtMinLongPremise : TextField
-txtMinLongConclusion : TextField
-txtMaxLongPremise : TextField
-txtMaxLongConclusion : TextField
-btnSave : Button
-btnGenerate : Button
-cbNodeType : ComboBox
-txtSystemsNumber : TextField = 1
-textViewer : TextArea
-txtOutput : TextField

GeneratorImplicationalSystemIO

+save(systems : List<ImplicationalSystem>, fileName : String) : void
#checkFile(fileName : String) : void

ImplicationsFactory

+initialize() : void
+getImplicationalSystem(nodesNumber : int, rulesNumber : int) : ImplicationalSystem
+getImplicationalSystems(implicationsModel : ImplicationsModel) : List<ImplicationalSystem>
+getImplicationalSystem(implicationsModel : ImplicationsModel) : ImplicationalSystem
#getConclusion(system : ImplicationalSystem, minLength : Integer, maxLength : Integer) : ComparableSet
#getPremise(system : ImplicationalSystem, minLength : Integer, maxLength : Integer) : ComparableSet
#getRandomInt(maxValue : int) : int
#getRandomInt(minValue : int, maxValue : int) : int

java-lattice

ImplicationalSystem

+ImplicationalSystem()
+ImplicationalSystem(sigma : Collection<Rule>)
+ImplicationalSystem(is : ImplicationalSystem)
+ImplicationalSystem(filename : String)
+init() : ImplicationalSystem
+random(nbS : int, nbR : int) : ImplicationalSystem
+getRules() : SortedSet<Rule>
+getSet() : SortedSet<Comparable>
+sizeElements() : int
+sizeRules() : int
+addElement(e : Comparable) : boolean
+addAllElements(x : TreeSet<Comparable>) : boolean
+deleteElement(e : Comparable) : boolean
+checkRuleElements(rule : Rule) : boolean
+containsRule(rule : Rule) : boolean
+addRule(rule : Rule) : boolean
+removeRule(rule : Rule) : boolean
+replaceRule(rule1 : Rule, rule2 : Rule) : boolean
+toString() : String
+save(filename : String) : void
+parse(filename : String) : ImplicationalSystem
+isProper() : boolean
+isUnary() : boolean
+isCompact() : boolean
+isRightMaximal() : boolean
+isLeftMinimal() : boolean
+isDirect() : boolean
+isMinimum() : boolean
+isCanonicalDirectBasis() : boolean
+isCanonicalBasis() : boolean
+isIncludedIn(is : ImplicationalSystem) : boolean
+makeProper() : int
+makeUnary() : int
+makeCompact() : int
+makeRightMaximal() : int
+makeLeftMinimal() : int
+makeDirect() : int
+makeMinimum() : int
+makeCanonicalDirectBasis() : int
+makeCanonicalBasis() : int
+representativeGraph() : DGraph
+dependencyGraph() : DGraph
+reduction() : TreeMap<Comparable, TreeSet<Comparable>>
+isReduced() : boolean
+closure(x : TreeSet<Comparable>) : TreeSet<Comparable>

Summary

Name	Description
implications.fxml	Implications generator main view.
ImplicationsController	Implications generator view's controller.
ImplicationsModel	Class which represents the features of implicational system to generate.
fr.kbertet.lattice.ImplicationalSystem	This class gives a representation for an implicational system (fr.kbertet.lattice.ImplicationalSystem), a set of rules. It belongs to the java-lattice library.
ImplicationsFactory	Implicational systems factory.
GeneratorImplicationalSystemIO	Implements the methods to save implicational systems in files.

Details

▤ implications.fxml

Name	Value
Description	Implications generator main view.
Visibility	public
Stereotypes	viewpoint

Attributes

private txtNodes : TextField			
Description	System nodes number field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtImplications : javafx.scene.control.TextField			
Description	Implications number field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtMinLongPremisse : javafx.scene.control.TextField			
Description	Premises min length field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtMinLongConclusion : javafx.scene.control.TextField			
Description	Conclusions min length field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtMaxLongPremisse : javafx.scene.control.TextField

Description	Premises max length field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtMaxLongConclusion : javafx.scene.control.TextField

Description	Conclusions max length field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private btnSave : javafx.scene.control.Button

Description	Save button.		
Type	javafx.scene.control.Button		
Getter	false	Setter	false
Multiplicity	1		

private btnGenerate : javafx.scene.control.Button

Description	Generate button.		
Type	javafx.scene.control.Button		
Getter	false	Setter	false
Multiplicity	1		

private cbNodeType : javafx.scene.control.ComboBox

Description	Dropdown with the node types: numerics (0, 1,, 2, ...), alphabeticals (a, b, c, ...) or alphanumerics (a0, a1, a2, ...).		
Type	javafx.scene.control.ComboBox		
Getter	false	Setter	false
Multiplicity	1		

private txtSystemsNumber : javafx.scene.control.TextField			
Description	Systems number field.		
Initial Value	1		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private textViewer : javafx.scene.control.TextArea			
Description	Viewer.		
Type	javafx.scene.controlTextArea		
Getter	false	Setter	false
Multiplicity	1		

private txtOutput : javafx.scene.control.TextField			
Description	Path output file field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

ImplicationsController

Name	Value
Description	Implications generator view's controller.
Visibility	public

Attributes

private model : ImplicationsModel			
Description	Model.		
Type	ImplicationsModel		
Getter	false	Setter	false
Multiplicity	1		

private validationSupport : org.controlsfx.validation.ValidationSupport			
Description	Validation support.		
Type	org.controlsfx.validation.ValidationSupport		
Getter	false	Setter	false
Multiplicity	1		

private logger : java.util.logging.Logger			
Initial Value	Logger.getLogger(ImplicationsController.class.getName())		
Type	java.util.logging.Logger		
Getter	false	Setter	false
Multiplicity	1		

private txtNodes : javafx.scene.control.TextField			
Description	Nodes number field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private txtImplications : javafx.scene.control.TextField			
Description	Implications number field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtMinLongPremisse : javafx.scene.control.TextField			
Description	Min length premise field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private txtMaxLongPremisse : javafx.scene.control.TextField

Description	Max length premise field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		

private txtMinLongConclusion : javafx.scene.control.TextField

Description	Min length conclusion field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private txtMaxLongConclusion : javafx.scene.control.TextField

Description	Max length conclusion field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private btnSave : javafx.scene.control.javafx.scene.control.Button

Description	Save button.		
Type	javafx.scene.control.javafx.scene.control.Button		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private btnGenerate : javafx.scene.control.javafx.scene.control.Button

Description	Generate button.		
Type	javafx.scene.control.javafx.scene.control.Button		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private cbNodeType : javafx.scene.control.ComboBox

Description	Node types dropdown.		
Type	javafx.scene.control.ComboBox		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private txtSystemsNumber : javafx.scene.control.TextField

Description	Number systems to generate field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private textViewer : javafx.scene.control.TextArea

Description	Generated systems viewer.		
Type	javafx.scene.control.TextArea		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private txtOutput : javafx.scene.control.TextField

Description	Output file path field.		
Type	javafx.scene.control.TextField		
Getter	false	Setter	false
Stereotypes	FXML		

private implicationsPane : javafx.scene.layout.AnchorPane

Description	Root pane.		
Type	javafx.scene.layout.AnchorPane		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private generationProgressInd : javafx.scene.control.ProgressIndicator			
Description	System generation progress indicator.		
Type	javafx.scene.control.ProgressIndicator		
Getter	false	Setter	false
Multiplicity	1		
Stereotypes	FXML		

private nodeType : AttributeType			
Description	Selected node type.		
Type	AttributeType		
Getter	false	Setter	false
Multiplicity	1		

private implicationSystems : java.util.List<fr.kbertet.lattice.ImplicationalSystem>			
Description	Generated system.		
Type	java.util.List<fr.kbertet.lattice.ImplicationalSystem>		
Getter	false	Setter	false
Derived	false		
Multiplicity	0..*		

Operations

public initialize (url : java.net.URL, rb : java.util.ResourceBundle) : void	
Parameters	**url**
	Description URL of the view.
	Multiplicity 1
	Type java.net.URL
	Direction inout
	rb
	Description Resource Bundle.
	Multiplicity 1
	Type java.util.ResourceBundle
	Direction inout
Description	Initializes the controller class.

protected initView () : void	
Description	Initializes the view.

protected initModel () : void	
Description	Creates an instance of ImplicationsModel.

protected viewToModel () : void	
Description	Reads the view values and saves them into the model.

protected initBindingjav() : void	
Description	Initializes the bindings.

protected initValidation () : void	
Description	Initializes the validation support.

protected initListeners () : void	
Description	Initializes the listeners.

public setOutput (outputPath : String) : void		
Parameters	**outputPath**	
	Description	Output file path.
	Multiplicity	1
	Type	🟢 String
	Direction	inout
Description	Sets the output file path into the output field.	

public handlePremisseSizeChange () : void	
Description	Cleans the max and min premise length fields decorators.
	This method is invoked by the max and min premise fields listeners.

public handleConclusionSizeChange () : void	
Description	Cleans the max and min conclusion length fields' decorators.
	This method is invoked by the max and min conclusion fields listeners.

public handleNodeTypeSelection (event : javafx.event.ActionEvent) : void		
Parameters	**event**	
	Description	Event.
	Multiplicity	1
	Type	javafx.event.ActionEvent
	Direction	inout
Description	When a node type is selected from the node types dropdown, the node type field is updated.	
Stereotypes	FXML	

public handleOutputAction (event : javafx.event.ActionEvent) : void		
Parameters	**event**	
	Description	Event thrown when de *Search* (…) button is pressed.
	Multiplicity	1
	Type	javafx.event.ActionEvent
	Direction	inout
Description	When the *Search* (…) button is pressed, opens the dialog box to select an output file, and copy the selected file path into Output field.	
Stereotypes	FXML	

public clean (event : javafx.event.ActionEvent) : void

Parameters	event	
	Description	Event thrown when *Clean* button is pressed.
	Multiplicity	1
	Type	javafx.event.ActionEvent
	Direction	inout
Description	Handles the event thrown when the Clean button is pressed and cleans the form fields.	
Stereotypes	FXML	

public handleGenerateButton (event : javafx.event.ActionEvent) : void

Parameters	event	
	Description	Event.
	Multiplicity	1
	Type	javafx.event.ActionEvent
	Direction	inout
Description	Handles the event thrown when the *Generate* button is pressed and generates the implications with the inserted values.	
Stereotypes	FXML	

public handleSaveButton (event : javafx.event.ActionEvent) : void

Parameters	event	
	Description	Even thrown when the *Save* button is pressed.
	Multiplicity	1
	Type	javafx.event.ActionEvent
	Direction	inout
Description	Saves the implicational system in the path inserted into Output filed.	
Stereotypes	FXML	

protected cleanView () : void	
Description	Cleans the view fields.

protected cleanModel () : void	
Description	Cleans the model values.

protected validate () : void	
Description	Performs the model validation.
Exceptions	RuntimeException If validation error exists.

protected save () : void	
Description	Saves the generated implicational systems with the GeneratorImplicationalSystemIO class.

protected showSaveDialog () : java.io.File	
Description	Shows the *Save* dialog box and returns the selected file.
Return Type Description	Selected file.

protected showText (system : fr.kbertet.lattice.ImplicationalSystem) : void		
Parameters	**system**	
	Description	Implicational system.
	Multiplicity	1
	Type	fr.kbertet.lattice.ImplicationalSystem
	Direction	inout
Description	Shows in the viewer an implicational system.	

protected showText (implicationsFile : java.io.File) : void		
Parameters	**implicationsFile**	
	Description	Implicational system.
	Multiplicity	1
	Type	java.io.File
	Direction	inout
Description	Shows in the viewer a saved system.	

public implicationsGenerated (systems : java.util.List<Implications>) : void		
Parameters	**systems**	
	Description	Generated implications.
	Multiplicity	1
	Type	java.util.List<Implications>
	Direction	inout
Description	Shows the generated system in the viewer, if was generated only one. If was generated several, shows the *Save* dialog box.	

protected publicSystemsGenerated (selectedFile : String) : void		
Parameters	**selectedFile**	
	Description	Output file path.
	Multiplicity	1
	Type	⬤ String
	Direction	inout
Description	Publishes a SystemSaved event by Eventbus.	

▤ ImplicationsModel

Name	Value
Description	Class which represents the features of implicational system to generate.
Visibility	public

Attributes

private nodes : Integer			
Description	Nodes number.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private implications : Integer			
Description	Implications number.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private maxPremiseLength : Integer			
Description	Premise attributes max length.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private minPremiseLength : Integer			
Description	Premise attributes min length.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private maxConclusionLength : Integer			
Description	Conclusion attributes max length.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private minConclusionLength : Integer			
Description	Conclusion attributes min length.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private showImage : Boolean			
Description	If the graph will be painted.		
Stereotypes	Property		
Type	Boolean		
Getter	true	Setter	true
Multiplicity	1		

private num : Integer			
Description	Number of systems to generate.		
Stereotypes	Property		
Type	Integer		
Getter	true	Setter	true
Multiplicity	1		

private systemCreated : javafx.beans.property.BooleanProperty			
Description	System created flag binding property.		
Type	javafx.beans.property.BooleanProperty		
Getter	false	Setter	false
Multiplicity	1		

private output : javafx.beans.property.StringProperty			
Description	Output file path binding property.		
Type	javafx.beans.property.StringProperty		
Getter	false	Setter	false
Multiplicity	1		

private nodeType : AttributeType			
Description	Node types. It can be numeric, alphabetical or alphanumeric.		
Stereotypes	Property		
Type	AttributeType		
Getter	true	Setter	true
Multiplicity	1		

Operations

public ImplicationsModel ()	
Description	Constructor.

public ImplicationsModel (nodes : Integer, implications : Integer)		
	nodes	
	Description	Nodes number
	Multiplicity	1
	Type	Integer
	Direction	inout
	implications	
	Description	Implications number.
	Multiplicity	1
	Type	Integer
	Direction	inout
Description	Constructor.	

public outputProperty () : javafx.beans.property.StringProperty	
Description	Returns the output file path binding property.
Return Type Description	The output file path binding property.

public getOutput () : String	
Description	Gets the output file path from the outputProperty property.
Return Type Description	Ouptut file path.

public systemCreatedProperty () : javafx.beans.property.BooleanProperty	
Description	Returns the system created flag binding property.
Return Type Description	The system created flag binding property.

public isSystemCreated () : Boolean	
Description	Gets if the system has been created from the systemCreatedProperty property.
Return Type Description	`true` if the system has been created, `false` otherwise.

public validate () : ResultModelValidation	
Description	Checks if the model is correct for the implicational system generation.
Return Type Description	Object with the validation results.

public clean () : void	
Description	Cleans the properties values.

ImplicationsFactory

Name	Value
Description	Random implicational systems factory.
Visibility	public

Operations

public initialize () : void	
Description	Initializes the factory.

public getImplicationalSystems (implicationsModel : ImplicationsModel) : java.util.List		
Parameters	**implicationsModel**	
	Description	Restrictions of the systems to generate.
	Multiplicity	1
	Type	ImplicationsModel
	Direction	inout
Description	Returns n implicational systems fulfilling the established restrictions in the implicationsModel parameter.	
Return Type Description	Implicational systems list.	

public getImplicationalSystem (nodesNumber : int, rulesNumber : int) : fr.kbertet.lattice.ImplicationalSystem		
Parameters	**nodesNumber**	
	Description	Nodes number.
	Multiplicity	1
	Type	int
	Direction	inout
	rulesNumber	
	Description	Implications number.
	Multiplicity	1
	Type	int
	Direction	inout
Description	Generates a random system with the nodes and implications number passed by parameter.	
Return Type Description	Generated implicational system.	

public getImplicationalSystem (implicationsModel : ImplicationsModel) : fr.kbertet.lattice.ImplicationalSystem		
Parameters	**implicationsModel**	
	Description	Restrictions of the systems to generate.
	Multiplicity	1
	Type	📄 ImplicationsModel
	Direction	inout
Description	Returns an implicational systems fulfilling the established restrictions in the implicationsModel parameter.	
Return Type Description	Random implicational system.	

protected getRandomInt (minValue : int, maxValue : int) : int		
Parameters	**minValue**	
	Description	Min value.
	Multiplicity	1
	Type	🟢 int
	Direction	inout
	maxValue	
	Description	Max value.
	Multiplicity	1
	Type	🟢 int
	Direction	inout
Description	Returns a random integer, between a min and max value passed as parameters.	
Return Type Description	Random integer value.	

protected getRandomInt (maxValue : int) : int		
Parameters	**maxValue**	
	Description	Max value.
	Multiplicity	1
	Type	⬤ int
	Direction	inout
Description	Returns a random integer, between 0 and maxValue parameter value.	

protected getConclusion (system : fr.kbertet.lattice.ImplicationalSystem, minLength : Integer, maxLength : Integer) : ComparableSet		
Parameters	**system**	
	Description	Implicational system.
	Multiplicity	1
	Type	📄 fr.kbertet.lattice.ImplicationalSystem
	Direction	inout
	minLength	
	Description	Min nodes number.
	Multiplicity	1
	Type	Integer
	Direction	inout
	maxLength	
	Description	Max nodes number.
	Multiplicity	1
	Type	Integer
	Direction	inout
Description	Returns a conclusion with a max nodes number. If maxLength parameter is null or less than 0, the max nodes number is the system nodes number.	
Return Type Description	Conclusion with a max nodes number.	
Exceptions	RuntimeException if the maxLength parameter is greater than attributes number.	

protected getPremise (system : fr.kbertet.lattice.ImplicationalSystem, minLength : Integer, maxLength : Integer) : ComparableSet		
Parameters	**system**	
	Description	Implicational system.
	Multiplicity	1
	Type	fr.kbertet.lattice.Implicational System
	Direction	inout
	minLength	
	Description	Min nodes number.
	Multiplicity	1
	Type	Integer
	Direction	inout
	maxLength	
	Description	Max nodes number.
	Multiplicity	1
	Type	Integer
	Direction	inout
Description	Returns a premise with a max nodes number. If the maxLength parameter is null or less than 0, the max nodes number is the system nodes number.	
Return Type Description	Premise with a max nodes number.	
Return Type Description	Random integer value.	

▤ GeneratorImplicationalSystemIO

Name	Value
Description	Implements the methods to save implicational systems in files.
Visibility	public

Operations

public save (systems : java.util.List< fr.kbertet.lattice.ImplicationalSystem>, fileName : String) : void		
Parameters	**systems**	
	Description	Implicational systems.
	Multiplicity	1
	Type	java.util.List < fr.kbertet.lattice.Implicational System>
	Direction	inout
	fileName	
	Description	File names prefix.
	Multiplicity	Unspecified
	Type	🟢 String
	Direction	inout
Description	Java Detail	N/A
Exceptions	java.io.IOException if read / write error occur.	

protected checkFile (fileName : String) : void		
Parameters	**fileName**	
	Description	File name.
	Multiplicity	1
	Type	🟢 String
	Direction	inout
Description	Checks if the file with name fileName parameter value exists. If no exists, this will be created.	
Exceptions	java.io.IOException if read / write error occur.	