# Requirements Editor<sup>©</sup>

User Manual of the Requirements Editor<sup>©</sup> Eclipse Plugin



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# **1. Introduction**

Requirements Editor<sup>©</sup> is an Eclipse plugin designed and developed by the Aristotle University of Thessaloniki as part of the S-CASE project [1]. The aim of this tool is to help developers express the static view of software projects using functional requirements.

The diagram tool is built using the Plug-in Development Environment (PDE) of Eclipse [2]. The tool's update site is:

http://s-case.github.io/s-case\_update\_site/

The tool is licensed under version 1.0 of the Eclipse Public License (EPL) [3].

# 2. Installing the Requirements Editor<sup>©</sup>

The installation procedure of the Requirements Editor<sup>©</sup> is simple. The easiest way to install the editor is by using the Eclipse plugin update site. In Eclipse, you can select the *Help* menu and click on the option *Install new software*. After that, click on the *Add...* button on the right to add a new repository. In the dialog box that opens insert the address of the Requirements Editor<sup>©</sup> update site

http://s-case.github.io/s-case\_update\_site/

Install								
Available Software       Select a site or enter the location of a site.								
Work with: type or se	lect a site Find more software by working with the <u>"Available Softwar</u>	• <u>A</u> dd <u>e Sites"</u> preferences.						
type filter text	Add Repository							
Name								
🔲 🚺 There is no :	Name: Requirements Editor Update Site							
	Location: http://s-case.github.io/s-case_update_site/							
Select All	OK   Cancel							
Show only the latest	versions of available software	-						
Group items by categ	ory What is already installed?							
Show only software a	pplicable to target environment							
☑ <u>C</u> ontact all update sit	es during install to find required software							
?	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel						

in the location field and fill in a name for the new repository.

After that the new repository should be selected in the *Work with* field. Tick the *Requirements Editor Plugin* and press *Next* in order to start the installation.

● Install	
Available Software Check the items that you wish to install.	
Work with: Requirements Editor Update Site - http://s-case.gith	ub.io/s-case_update_site/
type filter text	
Name	Version
▲ ♥ 100 Requirements Editor ♥ ♣ Requirements Editor Plugin	1.0.0.201503190950
Select All Deselect All 1 item selected Details This is the Requirements Editor plugin, a tool for the EU-funded p	roject S-CASE
Show only the latest versions of available software	☑ Hide items that are already installed
	What is <u>already installed</u> ?
Show only software applicable to target environment	
Contact all update sites during install to find required software	
	< <u>Back</u> <u>Next</u> <u>Finish</u> Cancel

Upon pressing Next once again, the install shield shows the product's license.

● Install	
Review Licenses Licenses must be reviewed before the software can be installed. This includinstall.	des licenses for software required to complete the
Licenses:	License <u>t</u> ext:
<ul> <li>Eclipse Foundation Software User Agreement</li> <li>Requirements Editor is released under the Eclipse Public License v1.0</li> </ul>	Requirements Editor is released under the Eclipse Public License v1.0         Copyright (C) 2014 Aristotle University of Thessaloniki         Eclipse Public License - v 1.0         THE ACCOMPANYING PROGRAM IS PROVIDED UNDER THE TERMS OF THIS ECLIPSE PUBLIC LICENSE ("AGREEMENT"). ANY USE, REPRODUCTION OR DISTRIBUTION OF THE PROGRAM CONSTITUTES RECIPIENT'S ACCEPTANCE OF THIS AGREEMENT.         1. DEFINITIONS         "Contribution" means: a) in the case of the initial Contributor, the initial code and documentation distributed under this Agreement, and b) in the case of each subsequent Contributor: i) changes to the Program, and         Image: The terms of the license agreements
	○ I do not accept the terms of the license agreements
? < <u>B</u>	ack Next > Finish Cancel

If you agree with the terms of the license agreements, select the radio button I accept the terms of the license agreements and press Finish. The Requirements Editor<sup>©</sup> shall start installing. Note that Eclipse may issue a security warning since the plugin is not signed with a certificate. You can safely ignore this warning by pressing *OK*.



Finally Eclipse will continue with the installation. Upon completion, you have to press Yes in the prompt box that asks you to restart Eclipse.



You can check that Requirements Editor<sup>©</sup> is installed by selecting the option *About Eclipse* of the *Help* menu and pressing *Installation Details*.

	) Eclipse Installation	Details						
	Installed Software	Installation History	Features	Plug-ins	Configuration			
	Name		Version		Id		Provider	
	Image: Book of the second s	ndard/SDK ents Editor Plugin	4.4.0.20140 1.0.0.20150	612-0500 3190950	epp.package.sta SCaseReqEditorf	ndard Feat	Aristotle University o	of Thessaloniki
About Eclipse								
								~
	?		Upg	date	<u>U</u> ninstall	P <u>r</u>	operties	<u>C</u> lose
	np 🍯 🧲							
Installation Details								

# 3. Updating the Requirements Editor<sup>©</sup>

Updating the tool is quite easy. The update is initialized by selecting *Help* and *Check* for Updates.



Since the tool is installed, Eclipse will contact the software site and will prompt for updating it if there is some newer version.

Contacting Software Sites	
Checking for updates	
Always run in background	
Ru	in <u>B</u> ackground Cancel <u>D</u> etails >>

Upon prompting the user, Eclipse will start the update procedure of the plugin which is similar to the Install procedure of the previous Section.

# 4. Using the Requirements Editor<sup>©</sup>

This Section covers the usage of Requirements Editor<sup>©</sup>. Initially, an overview of the main screens of the tool is shown and after that the procedure of adding and annotating requirements and importing/exporting them is demonstrated.

## 4.1. Overview

Requirements Editor<sup>©</sup> is a multi-page editor of Eclipse. The first page of the editor is shown in the following screenshot.

Java - RESTMARKS/Requirements.rqs - Eclipse SDK								
Eile Edit Navigate Search Project Bun Windo	w Help							
🗃 • 📾 💩 📐 🕸 • O • 💁 • 🕮 G	- 🌝 🎝 - 👔 -	1-6-6-6-					Quick Access	📑 🛃 Jay
😫 Package Explorer 12 🛛 🖹 😫 😤 🔍 🗆	R Requirements.rqs 22					0	D BE Outline 21	·
e BESTMARKS R. Requirements.rgs	<ul> <li>A logged in user must be able to create a user account by providing a username a</li> <li>A logged in to his account by providing his username</li> <li>A logged in user must be able to add a new bookmark to his account.</li> <li>A logged in user must be able to delete any bookmark from his account.</li> <li>A logged in user must be able to delete any bookmark from his account.</li> <li>A logged in user must be able to delete any bookmark from his account.</li> <li>A logged in user must be able to update his pase at logged in user must be able to delete any bookmark from his account.</li> <li>A logged in user must be able to update any bookmark from his account.</li> <li>A logged in user must be able to update any bookmark from his account.</li> <li>A logged in user must be able to mark his bookmarks as public or priva</li> <li>A logged in user must be able to add tags to his bookmarks.</li> <li>A logged in user must be able to retrieve the public bookmarks of any RESTMARK</li> </ul>				An outline is not availat	ble.		
		Any user must be al A logged in user, :	ble to searc	h by tag the	e public bookma by tag his priv	arks of all RES rate bookmarks	5	
	1		<u>6</u>					
	Problems 22 @ Jan 0 items	vedoc 🔯 Declaration						v = c
	Description	20 	Resource	Path	Location	Туре		

The first page is an editor containing user requirements. The second page, which is a UI annotations editor, is shown in the following screenshot.

Java - RESTMARKS/Requirements.rqs - Eclipse							0 - 3
Ele Edit Navigate Search Project Bun Windo	w Help						
0 · 8 6 2 × 6 · 0 · 4 · 8 6	• 💩 🖉 • 1 k • 1 k • • •					Quick Access	B Java
I Pockage Explorer SI	Actor Ac				Property paramore.	B     Coutine to     An outline is not available	а <u>п</u>
	Problems 😂 🥥 Javadoc 🔯 D	eclaration					~ - 0
	Description A	Resource	Path	Location	Туре		
						1	

Note that the user is able to change the size and the position of the editor as normally allowed by the Eclipse IDE.

## 4.2. Creating Requirement Annotations

#### 4.2.1. Creating Projects and Requirement Annotations Files

Requirement Annotations stored in Eclipse projects. So at first, one has to create a project by selecting the option *File* and then *New* and *Project...*. After that, the general type of project has to be selected.

New Project	_ <b>0</b> X
Select a wizard Create a new project resource	
<u>W</u> izards:	
type filter text	
<ul> <li>Java Project</li> <li>Isva Project from Existing Ant Buildfile</li> <li>Plug-in Project</li> <li>General</li> <li>Project</li> <li>CVS</li> <li>Do Isva</li> <li>Plug-in Development</li> </ul>	
? < <u>B</u> ack <u>Next &gt;</u> <u>Finish</u>	Cancel

After that, the user is asked to give a name for the project and press *Finish*. The process for creating a requirements file is similar. Upon selecting the option *File* and then *New* and *Project...* the user is presented with the following screen.

New						
Select a wizard						
<u>W</u> izards:						
type filter text						
<ul> <li>Interface</li> <li>Interface</li> <li>Iava Project</li> <li>Java Project from Existing Ant Buildfile</li> <li>Plug-in Project</li> <li>General</li> <li>CVS</li> <li>Git</li> <li>Java</li> <li>Plug-in Development</li> <li>Requirements Editor</li> <li>R Requirements Editor file</li> <li>User Assistance</li> </ul>	A EE					
? < <u>Back</u> Next > Einish	Cancel					

After clicking on *Next*, the next screen asks for a name for the newly created Requirements file.

0		
Requireme	ents Editor File	
This wizard opened by	I creates a new file with *.rqs extension that can be the Requirements Editor.	
<u>C</u> ontainer:	/RESTMARKS	Browse
<u>F</u> ile name:	Requirements.rqs	
0		
•	< <u>Back</u> Next > <u>Finish</u>	Cancel

Note that the name must have the extension rqs.

#### 4.2.2. Adding and Modifying Requirements

The user may add the functional requirements in text form in the first page of the Requirements Editor<sup>©</sup>, as shown in the following screenshot.

R Requirements.rqs 🛛
🗱 🖉 🚯 🕜 A user must be able to create a user account by providing a username and a password.
🗱 🖉 🕂 👔 A user must be able to login to his account by providing his username and password.
🗱 🖉 🚯 👔 A user that is logged in to his account must be able to update his password.
🗱 🖉 🚯 👔 A logged in user must be able to add a new bookmark to his account.
🗱 🖉 🕀 👔 A logged in user must be able to retrieve any bookmark from his account.
🗱 🖉 🕀 🕜 A logged in user must be able to delete any bookmark from his account.
🗱 🖉 🚯 🕜 A logged in user must be able to update any bookmark from his account.
🗱 🖉 🕂 🏠 A logged in user must be able to mark his bookmarks as public or private.
🗱 🖉 🕂 🏠 A logged in user must be able to add tags to his bookmarks.
🗱 🖉 🚯 🟠 Any user must be able to retrieve the public bookmarks of any RESTMARKS's community user.
🗱 🖉 🚯 🏠 Any user must be able to search by tag the public bookmarks of a specific RESTMARKS's user.
🗱 🖉 🕀 👔 Any user must be able to search by tag the public bookmarks of all RESIMARKS users.
🗱 🖉 🕂 👔 A logged in user, must be able to search by tag his private bookmarks as well.
Requirements Annotated Requirements

The user can add a new requirement by pressing the 🖻 button.

Requirements can also be deleted, using the  $\bowtie$  button, or modified, using the  $\bowtie$  button. Note than if a requirement is deleted or modified, the corresponding annotations of the requirement are also deleted.

Finally, requirements can be moved down or up using the 0 and 0 buttons.

## 4.2.3. Viewing and Modifying Annotations

Annotations can be viewed and modified in the second page of the Requirements Editor<sup>©</sup>. An example showing an annotated requirements file is shown in the following screenshot.

F	Requirements.rqs 🕱	- 8
	IsActorOf ActsOn HasProperty HasProperty HasProperty	<b>*</b>
A	Actor Action Property Object Property Property user must be able to create a user account by providing a username and a password.	
	IsActorOf IsActorOf ActsOn HasProperty HasProperty	E
A	Actor Action Object Action Property Property user must be able to login to his account by providing his username and password.	
	HasProperty IsActorOf ActsOn	
A	Actor Property Action Object user that is logged in to his account must be able to update his password.	
	HasProperty IsActorOf ActsOn	
A	Property Actor Action Object Object logged in user must be able to add a new bookmark to his account.	
	HasProperty IsActorOf ActsOn	
A	Property Actor Action Object Object Object Iogged in user must be able to retrieve any bookmark from his account.	+
∢ R	equirements Annotated Requirements	4

As shown in this screenshot, there are two types of annotations, *entities* and *associations*. Entities declare the type of each word (or phrase), and they can be one of:

- Actor
- Action
- Object
- Property

Associations declare the relations between different entities. The following relations are supported:

- IsActorOf, which is defined from an Actor to an Action;
- ActsOn, which is defined from an Action to an Object or from an Action to a Property;
- HasProperty, which is defined from an Actor to a Property or from an Action to a Property or from an Object to a Property.

Annotations are added and deleted using the right click context menu, while any modification of annotations is automatically saved to the file. Undo/redo operations are not supported.

An entity annotation can be created by selecting a word or phrase and right clicking on the selected word. After that the user can select the appropriate entity from the context menu.



Associations are created by right clicking on existing entity annotations. The Requirements Editor<sup>©</sup> automatically determines all possible associations from the currently selected entity and groups them in categories according to their type.



When no association is possible from a selected entity or any possible target entities are already selected, the tool does not allow selecting the association.



Finally, deleting an annotations is simple. One can delete an annotation by right clicking on it and selecting the option *Delete*. Note, however that entity annotations cannot be deleted if the related associations are not deleted first.



## 4.2.4. Automatic Annotation

The Requirements Editor<sup>©</sup> also supports automatically annotating software requirements using an NLP parser. This is performed by right clicking on the rqs file and selecting the option *Auto annotate*.



Note that when selecting this option all annotations are removed. Additionally, as shown in the above screenshot, the user can select to clear the annotations of a file using the menu option *Clear all annotations*. This command is particularly useful if the user wants to modify the requirements in the first page of the editor.

Finally, note that automatic annotation should be used as a helpful complement; however it is important that the user inspects the annotations and modifies them if required.

## 4.3. Importing/Exporting Requirements Annotations Files

The Requirements Editor<sup>©</sup> can import and export the requirements and the annotations of a project using the functionality of the Eclipse IDE.

### 4.3.1. Importing Requirements Annotations Files

Requirements Annotations Files are imported into projects from two formats, the *rqs* format and the *txt/ann* format. After right clicking on a project and selecting the *Import...* option in the context menu, the following screen is shown.

Import	
<b>Select</b> Import a Requirements Editor file from rqs format	2
Select an import source:	
type filter text	
<ul> <li>▷ ➢ General</li> <li>▷ ➢ CVS</li> <li>▷ ➢ Git</li> <li>▷ ➢ Install</li> <li>▷ ➢ Plug-in Development</li> <li>△ ➢ Requirements Editor</li> <li>ℝ Import requirements from rqs format</li> <li>ℝ Import requirements from txt/ann format</li> <li>▷ ➢ Run/Debug</li> <li>▷ ➢ Team</li> </ul>	
( <u>Back</u> )     ( <u>Next</u> )     ( <u>Finis</u> )	h Cancel

Then, the user can select either to import a final rqs file or to import a text file which includes the requirements and (optionally) an ann file which includes the respective annotations. Selecting the *Import requirements from rqs format* and clicking *Next* shows the following screen.

Import requirements in rqs format	
Requirements Editor Import Wizard Select your requirements file to import	
From directory: C:\MyRequirements	B <u>r</u> owse
MyRequirements          R       Requirements1.rqs         R       Requirements2.rqs	
Into fo <u>I</u> der: RESTMARKS	Bro <u>w</u> se
(?) < Back Next > Einish	Cancel

As shown in the above Figure, the user has to select the directory where the requirements files to be imported reside. After that, the user is presented with a list of requirements files on the right of the screen. Note that only files with extension rqs are accepted. In the bottom of the window, the user may select the project that will have the newly imported requirements files.

The procedure for importing txt and ann files is similar. Note however that importing an ann file without importing the respective txt file is not allowed (whereas the opposite is allowed).

## 4.3.2. Exporting Requirements Annotations Files

Exporting requirements and annotations is also a quite simple procedure. As in the import operations, one can export them in rqs or in txt/ann format by initially selecting the option *Export...* from the right click context menu of a project.

Export	
Select Export a Requirements Editor file in rqs format	ß
Select an export destination:	
type filter text	
<ul> <li>j &gt;</li></ul>	
? < <u>B</u> ack Next > <u>F</u> inish	Cancel

After that, the user selects the appropriate export wizard with regard to the format of the file that the file will be exported.

Similarly to the import option, the *Export requirements in rqs format* option is simple. The user selects the file to be exported and the directory to export the file to.

The *Export requirements in txt/ann format* option is also quite simple, however in this case the user has to select the export format. This is accomplished by ticking the options buttons after selecting the file to be exported and the export directory. Note that in this case it is possible to export either of the two formats without necessarily exporting the other one.

A screenshot of the txt/ann export wizard is shown in the following screen.

Export requir	ements in txt/ann forma	t	
Requirements Select your rec	Editor Export Wizard	I	
RES	STMARKS	<ul> <li>.project</li> <li>R Requirements.rqs</li> </ul>	
To director <u>y</u> :	C:\MyRequirements	] [	B <u>r</u> owse
Select export	format uirements in txt format otations in ann format		
?	< <u>B</u> ack	Next > <u>F</u> inish	Cancel

Note that trying to import or export any file with no rqs or txt/ann extension will cause Requirements  $\operatorname{Editor}^{\mathbb{G}}$  to display error messages.

# References

- [1] S-CASE project, FP7, project webpage: <u>http://www.scasefp7.eu/</u>
- [2] Eclipse Plug-in Development Environment (PDE), available online: https://eclipse.org/pde/
- [3] Eclipse Public License (EPL), version 1.0, available online: https://www.eclipse.org/legal/epl-v10.html