# **SOMMARIO**

PRE GAME	2
Conventions and tecnical set-up	2
Architecture	2
Interface	2
WHOLE UMLUML SEPARATED PART-RULE	3 3
UML SEPARATED PART-TRIGGERUML SEPARATED PART-ACTION	
Product backlog	5
Definition of done	7
BurnDown chart	7
SPRINT 1	10
sprint backlog	10
sprint review	11
sprint RETROSPECTIVE	12
SPRINT 2	13
sprint backlog	13
sprint review	15
sprint RETROSPECTIVE	16
SPRINT 3	17
sprint backlog	17
sprint review	18
sprint RETROSPECTIVE	19

# **PRE GAME**

## **CONVENTIONS AND TECNICAL SET-UP**

Programming language: Java;

IDE: NetBeans;

• Graphic interface: JavaFX;

• Testing: JUnit 4;

SCRUM design: Trello;

Coding conventions: Oracle Java coding conventions

Methods and variables: lowerCamelCase;

Classes, interfaces, exceptions: CamelCase;

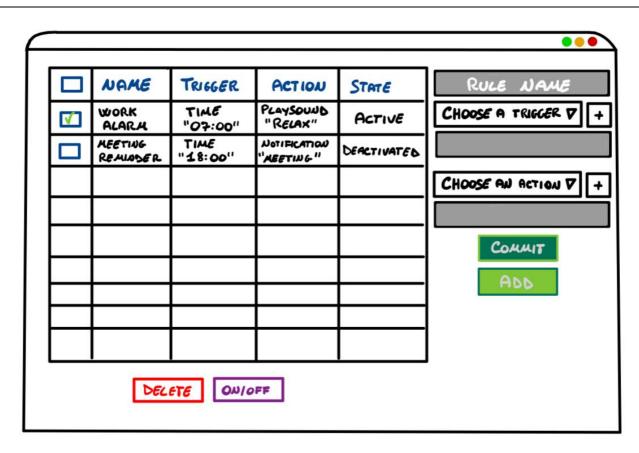
Constants: CAPITAL LETTERS.

## **ARCHITECTURE**

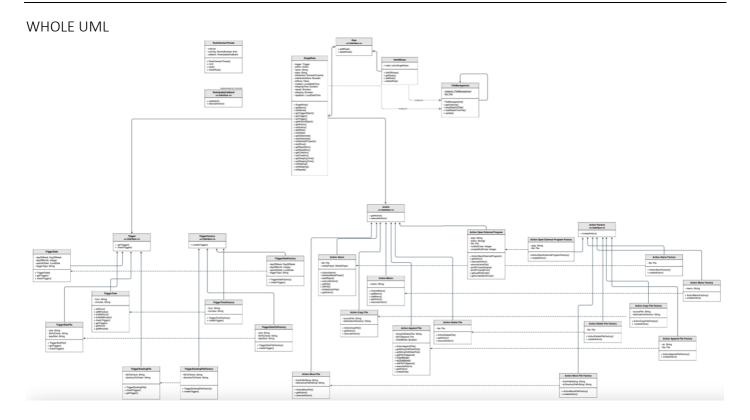
For this project was choosen the **Model-View-Control (MVC)** architectural pattern. In which there are three types of components:

- Model: Set of classes, specifically a subsystem that handles the application logic independently of the user interface;
- View: Takes care of displaying the information received from the model;
- Controller: Translates the input (e.g. pressing a button) provided by the user into requests that are made to the Model and that can lead to an update of the View.

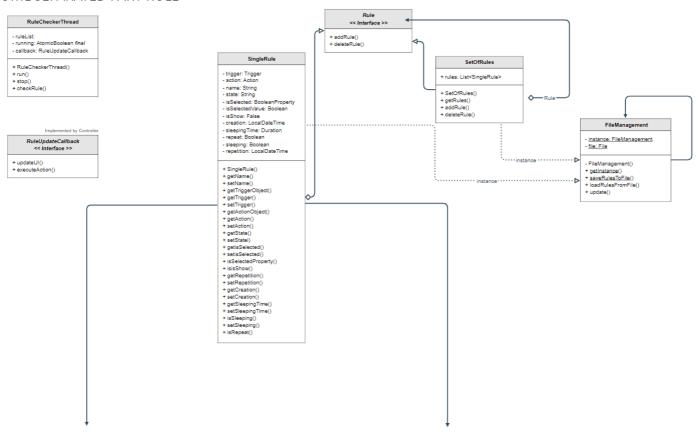
### **INTERFACE**



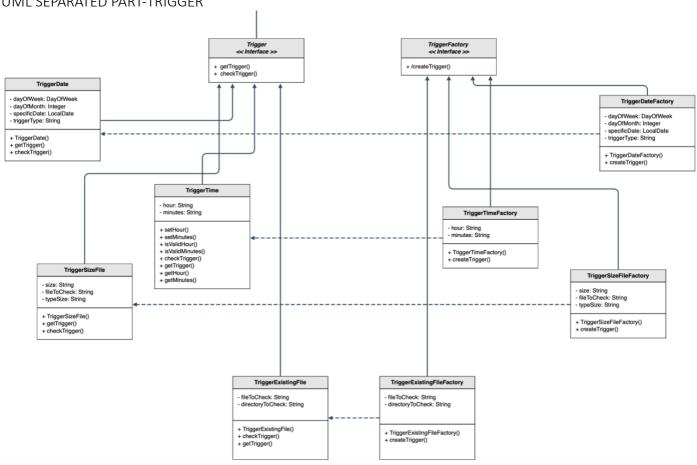
## **UML DIAGRAM**



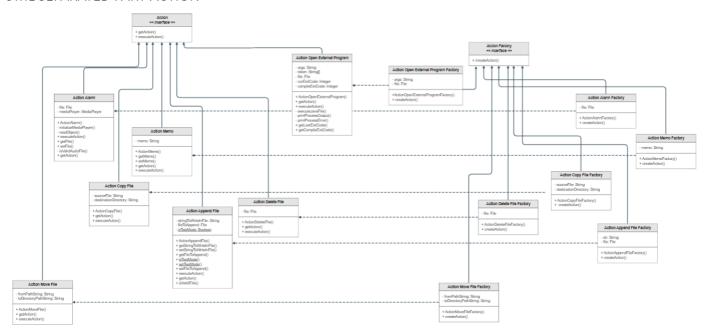
## **UML SEPARATED PART-RULE**



# UML SEPARATED PART-TRIGGER



## **UML SEPARATED PART-ACTION**



# **PRODUCT BACKLOG**

Priority: High, Medium-high, Medium, Medium-low, Low

#ID	ty: High, Medium-high, Med DESCRIPTION	CATEGORY	DEPENDENCIES	STORY	ACCEPTANCE CRITERIA	PRIORITY	STATUS
000	The application is a single user	Hear onic		POINT		-	_
000	The application is a single-user desktop program that allows the creation of rules with triggers based on a specific time. When the current time reaches the trigger, the program performs an action, such as playing an audio or displaying a message in a dialogue box. This control occurs every few seconds.	User epic	-	-	-	-	-
001	As user, I want to create a set of rules, So that I can automate a certain action.	User story	-	8	<ul> <li>When the user selects the alarm action, I want the fields to appear for choosing the time and the audio file.</li> <li>When the user selects the reminder action, I want the fields to appear to choose the time and to write the text.</li> </ul>	High	Done
002	As user,  I want to decide the time at which the action is to be executed,  So that the system can automatically check this time and activate the associated rule.	User story	#001	2	<ul> <li>When time is reached, I want the action to be executed once.</li> <li>When an invalid time is entered, I want the rule not to be set.</li> </ul>	High	Done
003	As user,  I want messages to be displayed in a dialogue box that requires an explicit action to be closed,  So that I cannot miss reminders or alerts.	User story	#001, #002	1	<ul> <li>When the time is reached, I want the preset dialog box to be displayed.</li> <li>As long as the user does not click on the specific button, I want the window to remain open.</li> </ul>	Medium- high	Done
004	As a user,  I want to be able to choose an audio file to be played when a rule is activated,  So that I can have a customized sound reminder.	User story	#001, #002	3	<ul> <li>When the user chooses to set an alarm, I want them to be able to choose an audio file as ringtone.</li> <li>When the time is reached, I want the sound file chosen by the user to be played.</li> </ul>	Medium- high	Done
005	As user, I want to be able to view past rules at program start-up, So that I can keep track of them.	User story	-	5	<ul> <li>When the program is started, I want the active/terminated rules to be visible on the application interface.</li> <li>When I insert a new rule, I want it to be visible in the table and added to the file.</li> </ul>	Medium- high	Done
006	As user,  I want to be able to delete previously entered rules,  So that I can manage the rules	User story	#005	3	When I have deleted the rule, I want it to no longer be displayed in the interface table.  When I have deleted the rule, I want the action associated with the deleted rule not to be triggered when the time is reached.  When I have deleted the rule, I want that rule to no longer appear in the file.	Medium- high	Done
007	As user, I want to be able to deactivate and reactivate a previously entered rule, So that I can manage the rules	User story	#005	5	• When I have deactivated the rule, I want it to be visible in the interface table with inactive status.	Medium- high	Done

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245	file with a specified name in a specified directory,  So that I can automate file management			0			Date
015	As user,  I want to be able to specify a file and a maximum size,  So that I can manage the storage space.	User story	,	8	When I select a file, I want the associated action to be executed if it exceeds a size limit.	Low	Done
016	As user,  I want certain actions to be automatically executed after the execution of an external program with specific command-line arguments,  So that I ensure that these actions are only triggered after the external program has finished with a particular output state.	User story	-	8	When an external program with specific arguments terminates with a particular output state, I want a specific action to be executed.	Low	To do
TD1	Repetition of code within the SetOfRules class. Specifically: FileManagement.saveRulesToFile(rules);	Technical debt	-	1	-	Medium	Done
TD2	Using the Observer pattern to optimize rule state change on file.	Technical debt	-	3	-	Medium- high	Done
TD3	Re-implement the trigger and action classes using the pattern Factory method.	Technical debt	-	8	-	Medium- high	Done
TD4	Replace the Service with the Thread class in Java	Technical debt	-	8	-	Medium- high	Done
TD5	Replace the ObservableList implementing the pattern Observer	Technical debt	-	13	-	High	Done
B1	Bug in the rule repetition in user story 008.	Bug	-	1	-	Medium- high	Done
B2	Bug in the ActionAppendFile test class	Bug	-	2	-	High	Done
В3	Bug when adding a repeated action before a non-repeated action	Bug	-	2	-	Medium- high	Done

## **DEFINITION OF DONE**

The definition of done below are valid for all the user stories:

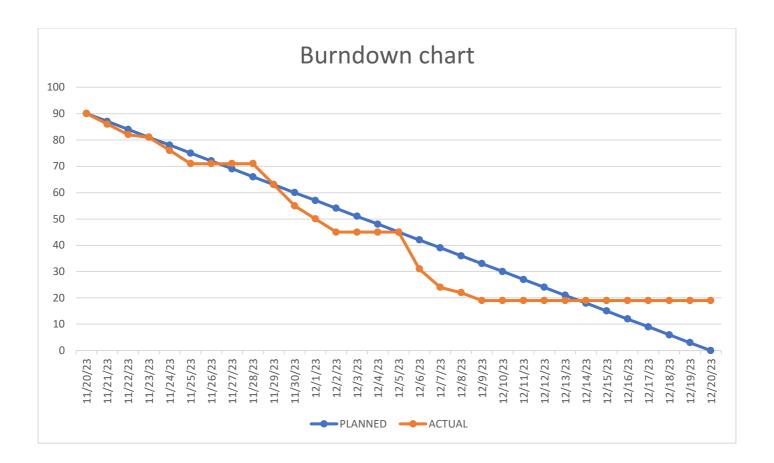
- Tests were performed and successful;
- The product backlog has been updated;
- The code has been reviewed by all other team members;
- The user story implementation meets ALL acceptance criteria.

## **BURNDOWN CHART**

Within the Burndown chart, only the story points of the user stories were included, to see the actual progress of the application. However, days when technical debts and bugs were resolved were specified in a special column, so there was no advancement in the user stories.

TIME STORY POINT

DAY	DATE	PLANNED	ACTUAL	NOTE
Monday	20/11/23	90	90	
Tuesday	21/11/23	87	86	
Wednesday	22/11/23	84	. 82	
Thursday	23/11/23	81	81	
Friday	24/11/23	78	76	
Saturday	25/11/23	75	71	
Sunday	26/11/23	72	71	
Monday	27/11/23	69	71	
Tuesday	28/11/23	66	71	Technical debts and bugs were solved
Wednesday	29/11/23	63	63	
Thursday	30/11/23	60	55	
Friday	01/12/23	57	50	
Saturday	02/12/23	54	45	
Sunday	03/12/23	51	45	
Monday	04/12/23	48	45	Technical debts and bugs were solved
Tuesday	05/12/23	45	45	Technical debts and bugs were solved
Wednesday	06/12/23	42	31	
Thursday	07/12/23	39	24	
Friday	08/12/23	36	22	
Saturday	09/12/23	33	19	
Sunday	10/12/23	30	19	
Monday	11/12/23	27	19	
Tuesday	12/12/23	24	19	
Wednesday	13/12/23	21	. 19	
Thursday	14/12/23	18	19	
Friday	15/12/23	15	19	
Saturday	16/12/23	12	19	
Sunday	17/12/23	9	19	
Monday	18/12/23	6	19	
Tuesday	19/12/23	3	19	
Wednesday	20/12/23	O	19	



# **SPRINT 1**

# **SPRINT BACKLOG**

ID	USER STORY/ACCEPTANCE CRITERIA	TASK	STORY POINTS	OWNER	PLANNED HOURS
001	As user, I want to create a set of rules, So that I can automate a certain action.		8		
	• When the user selects the alarm action, I want the fields to appear for choosing the time and the audio file.	Create an initial UI visible to the user in which there is a table summarizing the rules and a menu for choosing the rule.		Viktor, Pasquale	2
	When the user selects the reminder action, I want the fields to appear to choose the time	Implement code to show only the fields pertaining to the alarm setting, if selected.		Sara	3
	and to write the text.	Implement the code to display the fields pertaining to the reminder setting, if selected.		Pasquale	3
		Create the interfaces: Rule, Trigger e Action  Class implementations TriggerTime, ActionMemo, ActionAlarm, SingleRule e SetOfRules		Sara	2
002	As user,  I want to decide the time at which the action is to be executed,  So that the system can automatically check this time and activate the associated rule.		2		
	<ul> <li>When time is reached, I want the action to be executed once.</li> <li>When an invalid time is entered, I want the</li> </ul>	Implement in a Service the function that checks, every 10 seconds, whether we have arrived at the time to execute the rule.		Viktor	1,5
	rule not to be set.	Implement in a Service the function that executes the rule, only once when the time is reached.		Pasquale	2
		Implement the check on the time entered (example of invalid time: 25:25, AB:00, 00:AB, 18:65, etc.).		Viktor	0,5
		Changing the status (active/terminated) of the rule in the table once finished		Elena	1
		Integration of the various tasks Creation of test classes for each task		Each member tests what they write	2
003	As user,  I want messages to be displayed in a dialogue box that requires an explicit action to be closed,  So that I cannot miss reminders or alerts.		1		
	• When the time is reached, I want the preset dialog box to be displayed.	Implementing the dialogue box UI (example: pop-up)		Pasquale	1,5
	<ul> <li>As long as the user does not click on the specific button, I want the window to remain open.</li> </ul>	Implement the function that opens and closes the dialogue box once we have arrived at the right time, using the function created in user story 002.		Elena	2
		Integration of the various tasks Creation of test classes for each task		Viktor  Each member tests what they write	1
004	As a user,  I want to be able to choose an audio file to be played when a rule is activated,  So that I can have a customized sound reminder.		3		
	When the user chooses to set an alarm, I want them to be able to choose an audio file as	Implement the functionality of choosing the audio file from the user's computer.		Sara	3
	ringtone.	Implement the function to play the audio file.		Elena	3

	When the time is reached, I want the sound file chosen by the user to be played.	Implement control over the type of file selected by the user, not allowing formats such as .pdf, .txt, .csv, etc.		Viktor	0,5
		Integration of the various tasks		Pasquale	1
		Creation of test classes for each task		Each member tests what they write	1
005	As user, I want to be able to view past rules at program start-up, So that I can keep track of them.		5		
	• When the program is started, I want the active/terminated rules to be visible on the	Implement the event that inserts the set rule into the table of active/terminated rules.		Viktor	1,5
	<ul> <li>application interface.</li> <li>When I insert a new rule, I want it to be visible in the table and added to the file.</li> </ul>	Implement the retrieval of past rules from file, so that they can be inserted into the table once the program is reopened		Pasquale	1,5
		Integration of the various tasks		Elena	1
		Creation of test classes for each task		Each member tests what they write	1

### **SPRINT REVIEW**

### User stories done

All planned user stories have been completed: 001, 002, 003, 004, 005.

# **User stories added**

None

## **User stories deleted**

None

### **Technical debts**

- Initially, much of the code was placed in the interface controller, which led to coupling problems and problems in testing the code. Therefore it was decided to divide the methods implemented in the controller, where possible, into special java classes (e.g. for trigger control and action execution).
- •There is a repetition of code within the SetOfRules class. Specifically: FileManagement.saveRulesToFile(rules);

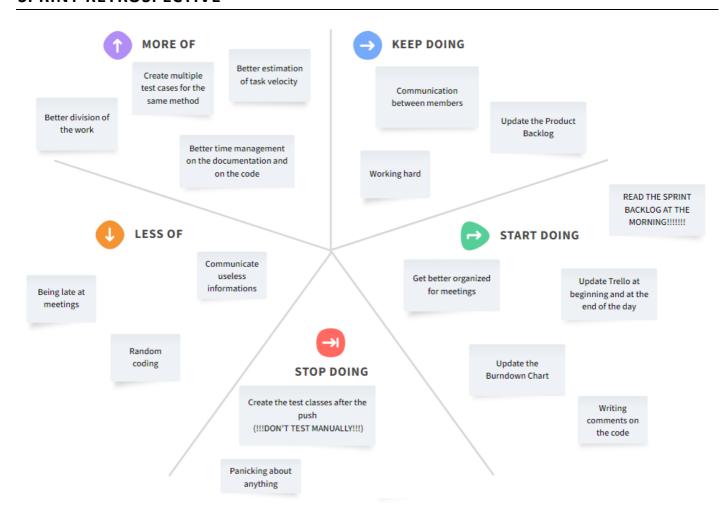
## **Bugs**

None

# **Sprint velocity**

Sprint velocity: 19

# **SPRINT RETROSPECTIVE**



# **SPRINT 2**

# **SPRINT BACKLOG**

ID	USER STORY/ACCEPTANCE CRITERIA	TASK	STORY POINTS	OWNER	PLANNED HOURS
006	As user,  I want to be able to delete previously entered rules,  So that I can manage the rules		3		
	When I have deleted the rule, I want it to no longer be displayed in the interface table.     When I have deleted the rule, I want the	Implement the onBtnDelete() method of the Controller class (delete the rule from the list/table/file)		Pasquale	2
	action associated with the deleted rule not to be triggered when the time is reached.  • When I have deleted the rule, I want that rule to no longer appear in the file.	Implement cancellation confirmation  Creation of test classes for each task		Pasquale  Each member tests what they write	1
007	As user,  I want to be able to deactivate and reactivate a previously entered rule,  So that I can manage the rules		5	Witte	
	<ul> <li>When I have deactivated the rule, I want it to be visible in the interface table with inactive status.</li> <li>When I have deactivated the rule, I want checks on that rule to not occur until I</li> </ul>	Implement the onBtnOnOff method of the Controller class (based on the click of the on/off button, the rule shall become active/deactive and change the state of the rule in the file).		Sara	3
	reactivate it.  • When I have reactivated the rule, I want it to be visible in the interface table with active status.  • When I deactivated or reactivated the rule, I want the status to be updated on the file	Creation of test classes for each task		Each member tests what they write	1
008	As user,  I want to be able to choose whether to repeat a rule several times by specifying a waiting time (in days, hours, minutes),  So that I can manage when to repeat the rules.		5		
	• When I have set the rule for once, I want the action to happen at that instant and then be deactivated.	Add to the UI a checkbox to decide whether to repeat the rule, plus a graphic component to choose after how much to repeat it.		Elena	2
	<ul> <li>When I have set the rule for several times, I want the action to be re-executed after the waiting time has elapsed.</li> </ul>	Update the attributes of the SingleRule class and its methods with: a boolean attribute for the checkbox and another to define when it should be repeated		Elena	1
		Update Service to ensure that after the rule has been triggered, if it is to be repeated, it is re-initialized at the next time decided by the user.		Elena	3
		Integration of the various tasks  Creation of test classes for each task		Elena Each member tests what they write	1
009	As user,  I want to be able to write a specific string to the end of a specified file when the rule is activated,  So that I can update my files with new information.		5		
	• When I have specified the string to be written and the file, I want the string to be written at the end of that file once the trigger is verified.	Add to the UI the possibility of choosing the action of append to a file, with fields inherent to that action.		Viktor	2
		Implement the controller methods related to the graphic components described above.		Viktor	2
		Create the class ActionAppendFile and implement the executeAction() method.		Viktor	2

		Create the method for writing to files in the		Viktor	1
		class ActionAppendFile. Integration of the various tasks		Viktor	1
		Creation of the various tasks  Creation of test classes for each task		Each member	1
		Creation of test classes for each task		tests what they write	1
011	As user,		3		
	I want to be able to delete a file from a				
	directory when the rule is activated, <b>So that</b> I can maintain the efficiency of my				
	storage space.				
	• When I choose the file to be deleted in a	Add within the UI, in the drop-down menu of		Sara	0,5
	specific directory, I want the file to no longer	the actions, a field for choosing to delete a			
	be present in that directory once the trigger	file.			
	has occurred.	Add the possibility of choosing all file types		Sara	0,5
		(not only mp3, wav, etc.)  Implement the onBtnDeleteFile method to		Sara	1
		select the file to be deleted.		Jaia	1
		Creation of a new class ActionDeleteFile with		Pasquale	0,5
		the necessary methods			
		Implementation of the ActionDeleteFile class		Pasquale	2
		with methods that check the selected file and			
		display various messages according to the status of the file (e.g. deleted successfully, file			
		already deleted, etc.).			
		Integration of the various tasks		Pasquale	1
		Creation of test classes for each task		Each member	1
				tests what they	
212	•		F	write	
010	As user,  I want to be able to copy or move a file from		5		
	one directory to another when the rule is				
	activated,				
	so that I can manage files according to my				
	needs.				-
	• When I have specified the file and destination directory to which it is to be copied, I want the	Adding within the UI the possibility of choosing whether to move a file from one		Pasquale	1
	file to be present on both the source and	directory to another			
	destination directories once the trigger has	Adding within the UI the possibility of		Sara	1
	been verified.	choosing whether to copy a file from one			
	• When I have specified the file and destination	directory to another			
	directory to which it is to be moved, <b>I want</b> the	Create the class ActionMoveFile and		Elena	2
	file to be present only in the destination directory once the trigger has been verified.	implement the executeAction() method, which allows a file to be moved from one			
	a estary office the trigger has been verified.	directory to another			
		Create the ActionCopyFile class and		Viktor	2
		implement the executeAction() method,			
		which allows a file to be copied from one			
		directory to another  Integration of the various tasks		Sara	1
		integration of the various tasks		Jaia	1
		Creation of tast classes for as it task		Foods are a market and	1
		Creation of test classes for each task		Each member tests what	1
				they write	
TD1	Repetition of code within the SetOfRules class.	-	1	Pasquale	0,5
	Specifically:				
TDO	FileManagement.saveRulesToFile(rules);		2	Comp	2
TD2	Using the Observer pattern to optimise rule state change on file.	-	3	Sara	3
B1	Bug in the rule repetition in user story 008.	-	1	Elena	1
B2	Bug in the ActionAppendFile test class	-	2	Pasquale	1

### **SPRINT REVIEW**

### User stories done

The following user stories have been completed: 006, 007, 008, 009, 010, 011

### User stories added

The user story 011 was added to the sprint

### **User stories deleted**

None

### **Technical debts**

- A code repetition within the SetOfRules class was resolved. Specifically: FileManagement.saveRulesToFile(rules);
- The technical debt was solved to optimize the change of state of the rule on file, using the Observer pattern.

### **Bugs**

The bug in the rule repetition in user story 008 has been fixed. As once the rule was reactivated, it displayed the dialogue box every 10 seconds.

## **Sprint velocity**

Sprint velocity: 26 + 7 for bug and technical debts

## **SPRINT RETROSPECTIVE**



# **SPRINT 3**

# **SPRINT BACKLOG**

ID	USER STORY/ACCEPTANCE CRITERIA	TASK	STORY POINTS	OWNER	PLANNED HOURS
012	As user,  I want to be able to execute an external program with specified command line arguments,  So that I can automate external processes.		13		
	When I choose an external program and specify the arguments to be passed, I want	Updating the GUI with the necessary components		Sara	2
	the program to be executed with these arguments when the trigger is triggered.	Create the ActionOpenExternalProgram class and implement the methods to open an external program with specified line arguments		Sara	2
		Create the ActionOpenExternalProgramFactory class and implement the createAction method		Sara	0,5
		Update the switch case in the createActionFactory method in the Controller class.		Sara	0,5
		Creation of test classes for each task		Each member tests what they write	1
013	As user,  I want to be able to choose a specific day of the week or month or a specific date on which the action is to be performed,  So that the system can automatically check the day or date and activate the associated rule.		3		
	When I specify the day of the week or month, I want the associated action to be executed when that day arrives.     When I specify the date, I want the associated action to be executed when that date arrives.     When I specify an invalid day or date, I want the associated action not to be executed.	Update the GUI with TriggerDate input fields and logic.		Elena	1
		Create the TriggerDate class		Elena	2
		Create the TriggerDateFactory class  Update the switch case in the		Elena	0,5
		createTriggerFactory method in the Controller class.		Elena	0,5
		Creation of test classes for each task		Each member tests what they write	1
014	As user,  I want to be able to perform a specified action when I choose a file with a specified name in a specified directory,  So that I can automate file management		5		
	• When I specify a file in a directory, I want the system to perform the action only if that	Updating the GUI with the necessary trigger components		Viktor	1
	file exists.	Create the triggerExistingFile class (create the checkTrigger and getTrigger functions)		Viktor	2
		Create the triggerExistingFileFactory class		Viktor	0,5
		Update the switch case in the createTriggerFactory method in the Controller class.		Viktor	0,5
		Creation of test classes for each task		Each member tests what they write	1
015	As user,  I want to be able to specify a file and a maximum size,  So that I can manage the storage space.		5		
	• When I select a file, I want the associated action to be executed if it exceeds a size limit.	Updating the GUI with the necessary trigger components		Viktor	1
		Create the triggerSizeFile class		Viktor	2
		Create the triggerSizeFileFactory class		Viktor	0,5

		Update the switch case in the createTriggerFactory method in the Controller class.		Viktor	0,5
		Creation of test classes for each task		Each member tests what they write	1
TD3	Re-implement the trigger and action classes using the pattern Factory method.		8		
		Re-implement the action classes using the pattern FactoryMethod		Sara	4
		Re-implement the trigger classes using the pattern FactoryMethod		Elena	4
TD4	Replace the Service with the Thread class in Java		8	Pasquale	4
TD5	Replace the ObservableList implementing the pattern Observer		13	Pasquale	6
В3	Bug when adding a repeated action before a non-repeated action		2	Elena	1

### **SPRINT REVIEW**

#### User stories done

The following user stories have been completed: 012, 013, 014, 015.

#### **User stories added**

None

### User stories deleted

016

### **Technical debts**

- Re-implement the trigger and action classes using the pattern Factory method, re-implementing the action and the trigger classes.
  - By employing the Factory Method, we aimed to avoid the pitfalls of extensive nested conditionals, which led our code to become difficult to read, understand, and maintain. With this modification, each factory method is responsible for creating a specific type of object, isolating the instantiation logic within its own scope.
- Replace the Service with the Thread class in Java. This decision was made prioritizing the portability
  of the application. Since Services are specific to JavaFX, we opted to replace them with a Java Thread
  as it offers a broader portability scope. This adjustment ensures compatibility across different
  environments and platforms, aligning with our goal of enhancing the application's versatility.
- Replace the ObservableList implementing the pattern Observer. The motivation behind this decision is to enhance the flexibility and maintainability of the codebase. By adopting the Observer pattern, we decouple the components in the system, making it easier to accommodate changes and updates. This modification provides a more modular and extensible solution compared to the direct use of ObservableList, aligning the code with design principles that promote separation of concerns and ease of future enhancements.

# Bugs

We solved a bug in the Thread class where every time we executed a non-repeated rule after a repeated one, it wouldn't be executed.

## **SPRINT RETROSPECTIVE**

