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# COLLABORATIVE PROGRAMMING

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ECLIPSE PLUGIN FOR CONCURRENT SOFTWARE DEVELOPMENT WITH  
SUPPORT FOR AGILE TECHNIQUES

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## AUTHORS:

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Rodak Krzysztof  
Skawiński Przemysław  
Strojek Adam  
Zawada Jakub

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# INTRODUCTION

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Collaborative Programming Project concern to implementation of a tool as an Eclipse plugin. It aim is to support the work in a distributed environment and running the project according to Scrum methodology.

## MOTIVATION

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In the present situation, working in distributed team on one project occurs very often. Therefore, there is a considerable need to support communication between team members and improve the work in a distributed environment.

Proposed tool aims to support the following aspects of running a project according to Scrum methodology with the distributed character of working team.

- **Execute Daily Scrum Meeting in distributed environment. (Stand-up)**
- **Planning and task complexity estimating support. (Sprint Planning Meeting)**
- **Communication support in distributed environment through the integrated tools in Eclipse IDE (Small Team)**
- **Collaboration support between team members by preview code changes in real time.**
- **Performing and managing peers' code review with proper components support.**

## PROJECT CONTENT

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Project was running by students team at Wroclaw University of Technology, lead by PhD, DSc Lech Madeyski (e-mail: <mailto:lech.madeyski@pwr.wroc.pl>, WWW: <http://madeyski.e-informatyka.pl>).

### **Team members:**

- inż. Krzysztof Rodak (<mailto:164825@student.pwr.wroc.pl>)
- inż. Przemysław Skawiński, (<mailto:164534@student.pwr.wroc.pl>)
- inż. Adam Strojek, (<mailto:164707@student.pwr.wroc.pl>)
- inż. Jakub Zawada, (<mailto:164820@student.pwr.wroc.pl>)

### **Project Source Code:**

- Sourceforge Project Site: <https://sourceforge.net/projects/collabprogram/>
- Academic GIT Repository

**Plugin dependencies:**

- XStream Library ( <http://xstream.codehaus.org/> )
- <http://www.java2s.com/Code/Jar/DEF/com.ibm.icu.3.6.1.v20070417.jar.htm>
- Graphical Modeling Framework (GMF) Runtime1.5.0  
org.eclipse.gmf.feature.group
- Graphical Modeling Framework (GMF) Runtime Examples 1.5.0  
org.eclipse.gmf.examples.runtime.feature.group
- Smack API ( <http://www.igniterealtime.org/projects/smack/index.jsp> )

**Used methodology:**

SCRUM with tool: <http://www.assembla.com>

# FUNCTIONALITY

## CODE REVIEW

*Code review* is a systematic examination of application source code. Its purpose is to easily locate and fix mistakes during development phase, which effects in improved both overall quality of software and developer's skills.

CP Plugin supports code review practice as a peer review in distributed environment. It enables following actions for user, who take a role of peers' code reviewer:

1. **Add code review/ general comment** - this functionality allows user to perform peer code review and present it to rest of the team in form of synchronized data with enough details to cover most of use cases.

Edition of above parameter is available by following interface:

Description of code review details information:

- **Review type** – reviewer / commenter can choose from following types: Program logic, Refactory need, Comment, Test summary.
- **Severity** - inform on how urgent and important is message. Options: Minor, Normal, Critical.
- **Summary** – Short information, which summaries issue.
- **Details** – which should contains details about specific code review / comment

- **Related file (optional)** – code review mechanism gives a possibility for reviewer to select file or even specific file's lines, which are a topic for current review – this way it's easy to see which review refers to which file and piece of code in the project, for all peers.
- **Reviewer** – automatically, reviewer information is added to review data

```

39 buf.append("(init ");
40 buf.append(teamName);
41 buf.append(" (version ");

```

## 2. Maintain existing code review, comments, navigate to related files



All code review data is presented using ergonomic table-based interfaces. It enables basic operation like adding, editing, deleting code reviews.

ID	Severity	Type	Reviewer	Summary	File	Review Description
1	Refactory ...	Normal	k.rodak	Need to refactor	CmdParserPlayerToke...	Please refactor this part
2	Comment	Minor	j.zawada	Just comment	CmdParserPlayerToke...	
3	Unset	Unset	j.zawada		CmdParserPlayerToke...	
4	Program lo...	Minor	k.rodak	Wrong access	CmdParserPlayerToke...	
5	Test summ...	Critical	j.zawada	Test is not passing	Errors.java	Make sure that ...

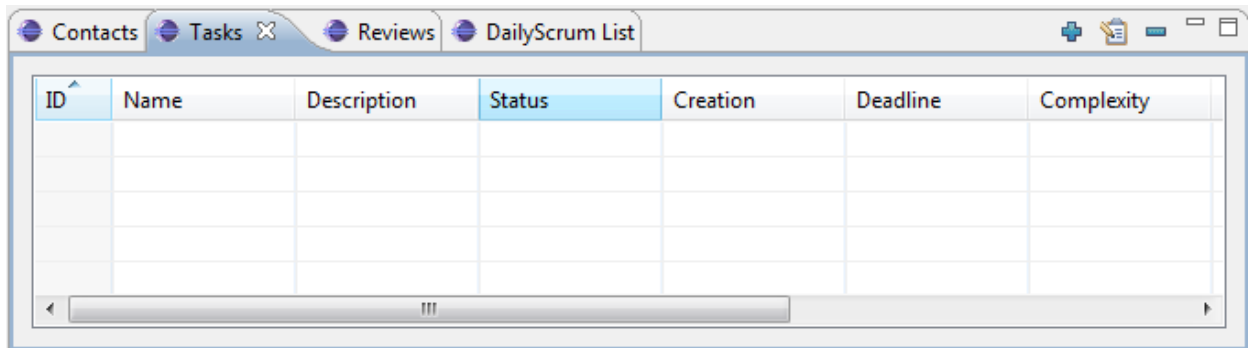
Moreover, selecting code review, automatically triggers opening related file and moving cursor to related piece of code – which enhances usability and make it easy to track important data.



## MANAGING TASKS

Task managing feature helps developer team in keeping good work organization. Task feature is one of the fundamental part in almost each application/plugin of this kind. There is possibility to create new tasks, remove or edit existing tasks. Each task consists of the following fields:

- **Id** – unique identity number
- **Name** – short task name
- **Description** – description of the task, information about what is to do;
- **CurrentStatus** – information about the task state, it can be one of:
  - NEW – just created task without owner
  - ASSIGNED – task with assigned owner
  - READY\_FOR\_TESTS – task ready for tests
  - TESTED – task tested
  - RESOLVED – resolved
- **Creation** – date of creation
- **Deadline** – deadline
- **Complexity** – workload, evaluated with Scrum Poker
- **currentOwner** – team member who is responsible for the task



ID	Name	Description	Status	Creation	Deadline	Complexity





## SUPPORTING SCRUM PRACTICES

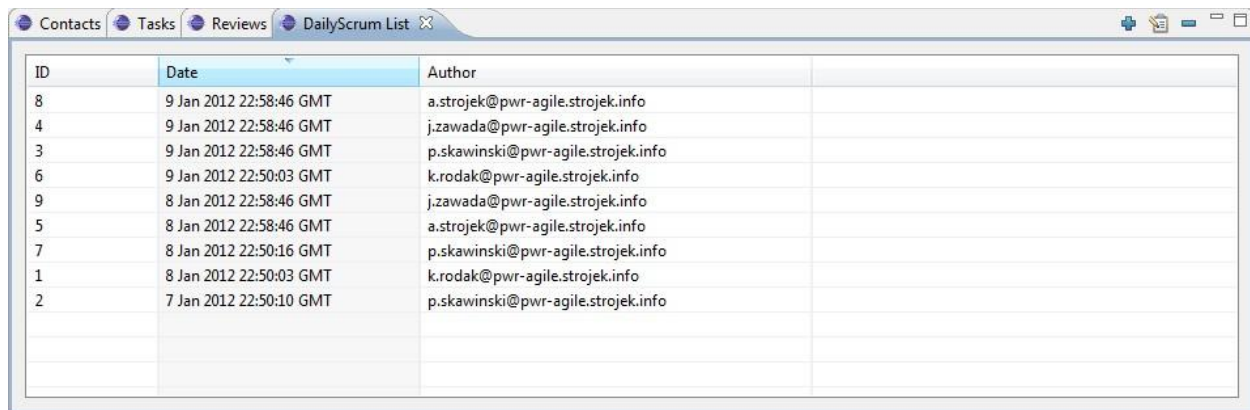
When considering team working in distributed environment, basic data synchronization is not enough to minimize differences comparing to stable, one-location environment. Therefore, we introduce mechanisms, which support various SCRUM-related practices in distributed environment.

### SCRUM DAILY MEETINGS

Collaborative Programming plugin supports Daily Scrum practice in distributed environment. It provides a tool to making Daily Scrum Reports. It can replace Standups, when team is distributed. On each day, each team member should first make a report and answers three questions:

- ***What has he done during the last day?***
- ***What is he going to do today?***
- ***Any questions or problems?***

All report can be found on Daily Scrum Report List view, as a list of reports, with them creation date and author.



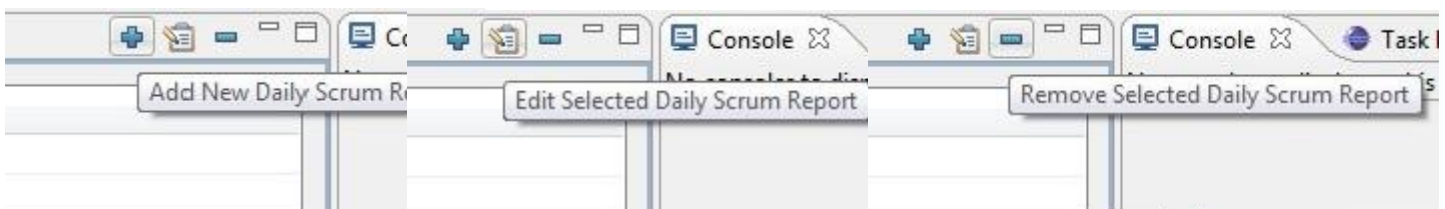
ID	Date	Author
8	9 Jan 2012 22:58:46 GMT	a.strojek@pwr-agile.strojek.info
4	9 Jan 2012 22:58:46 GMT	j.zawada@pwr-agile.strojek.info
3	9 Jan 2012 22:58:46 GMT	p.skawinski@pwr-agile.strojek.info
6	9 Jan 2012 22:50:03 GMT	k.rodak@pwr-agile.strojek.info
9	8 Jan 2012 22:58:46 GMT	j.zawada@pwr-agile.strojek.info
5	8 Jan 2012 22:58:46 GMT	a.strojek@pwr-agile.strojek.info
7	8 Jan 2012 22:50:16 GMT	p.skawinski@pwr-agile.strojek.info
1	8 Jan 2012 22:50:03 GMT	k.rodak@pwr-agile.strojek.info
2	7 Jan 2012 22:50:10 GMT	p.skawinski@pwr-agile.strojek.info

View provides easy way to sort reports with id, date, or author.

To manage reports list are used 3 buttons:

- **add new daily Scrum report**
- **edit selected daily Scrum report**
- **remove selected daily Scrum report**

To use edit or remove element, some report on list have to be selected.



After selecting *Add New Daily Scrum Reportor Edit Selected Daily Scrum Report* we are presented with a pop-up window which allows to add / edit proper information concerning daily scrum report. Moreover, we can set exact date for SCRUM report.

The screenshot shows a software interface with a sidebar on the left containing 'Pack', 'JUnit', and 'RoboCup'. The main area displays a 'Daily Scrum Metting Report' dialog box. Below the dialog, there is a 'DailyScrum List' table with columns for ID, Date, and Author. A 'Console' panel on the right shows 'No console'.

**Daily Scrum Metting Report**

Author: p.skawinski@pwr-agile.strojek.info

Date: 2012-01-07

What I've done during the last day:  
Yesterday, I worked on the class.

What I'm going to do today:  
I will continue with the class.

MY questions, problems or needs:  
No blocking issues

Save Cancel

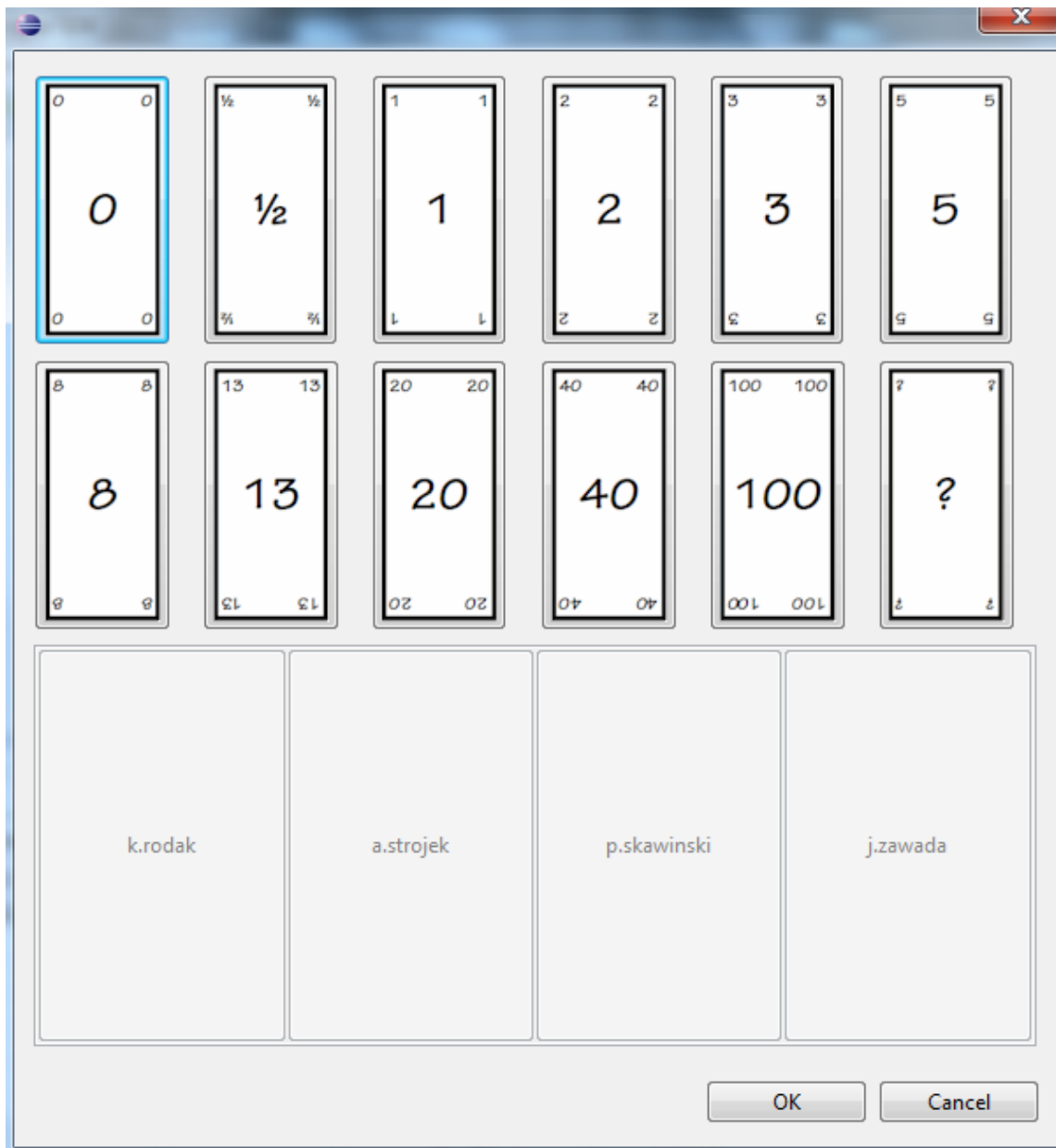
ID	Date	Author
1	8 Jan 2012 22:50:03 GMT	k.rodak@pwr-agile.strojek.info
2	7 Jan 2012 22:50:10 GMT	p.skawinski@pwr-agile.strojek.info
3	9 Jan 2012 22:58:46 GMT	p.skawinski@pwr-agile.strojek.info
4	9 Jan 2012 22:58:46 GMT	j.zawada@pwr-agile.strojek.info
5	8 Jan 2012 22:58:46 GMT	a.strojek@pwr-agile.strojek.info
6	9 Jan 2012 22:50:03 GMT	k.rodak@pwr-agile.strojek.info
7	8 Jan 2012 22:50:16 GMT	p.skawinski@pwr-agile.strojek.info
8	9 Jan 2012 22:58:46 GMT	a.strojek@pwr-agile.strojek.info
9	8 Jan 2012 22:58:46 GMT	j.zawada@pwr-agile.strojek.info
10	10 Jan 2012 23:20:47 GMT	p.skawinski@pwr-agile.strojek.info

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## SCRUM POKER

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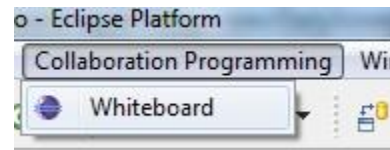
Estimation of tasks' workload is one of the crucial issue in efficient development. Having well estimated tasks allows for good tasks allocation. The plugin supports well known practice – Scrum Poker. The practice involves all team members to carry some kind of voting in order to evaluate tasks workload. Each user has at his disposal 8 cards with different values. The user choose the card, which value reflects the workload the most properly in his opinion. Choices of other users are visible after the choice of the user. When all votes are made, the users can discuss the results and put numerical value for task complexity according to chosen card and suggestions.



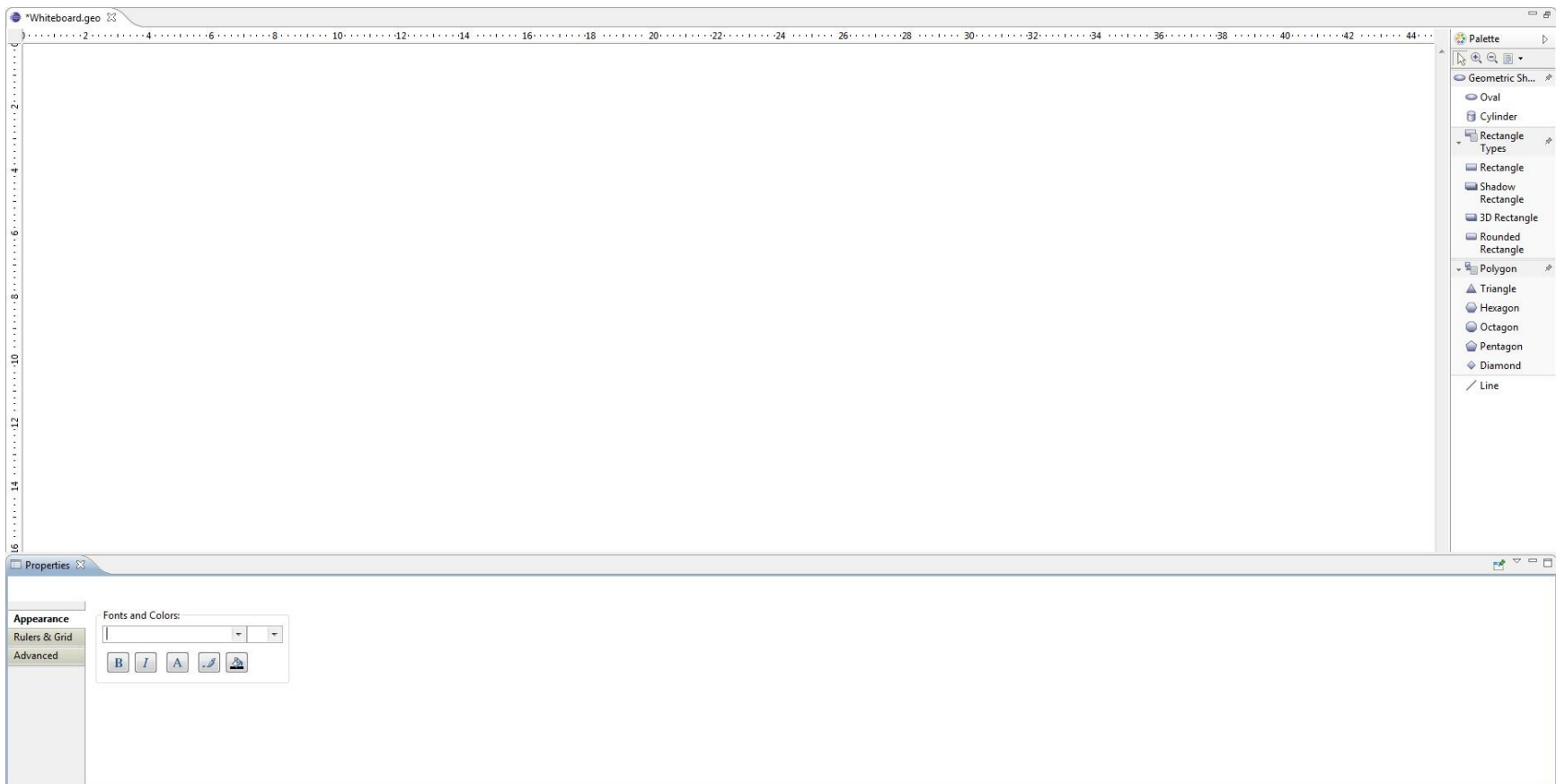
## WHITEBOARD

*Whiteboard* is a tool that allow to write text or/and draw diagrams, and share them with team.

Whiteboard can be started with top menu action: *Collaboration Programming ->Whiteboard*.

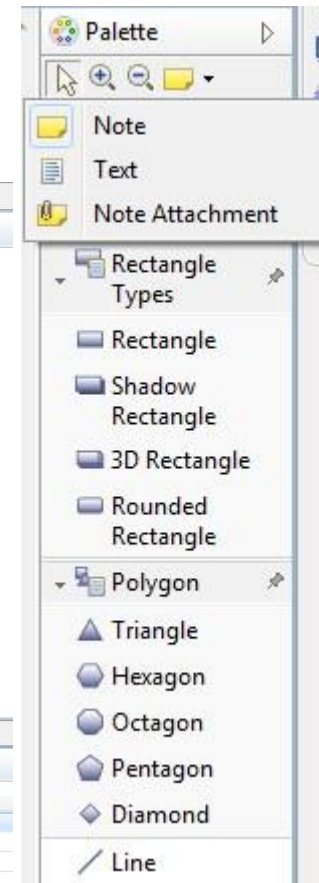
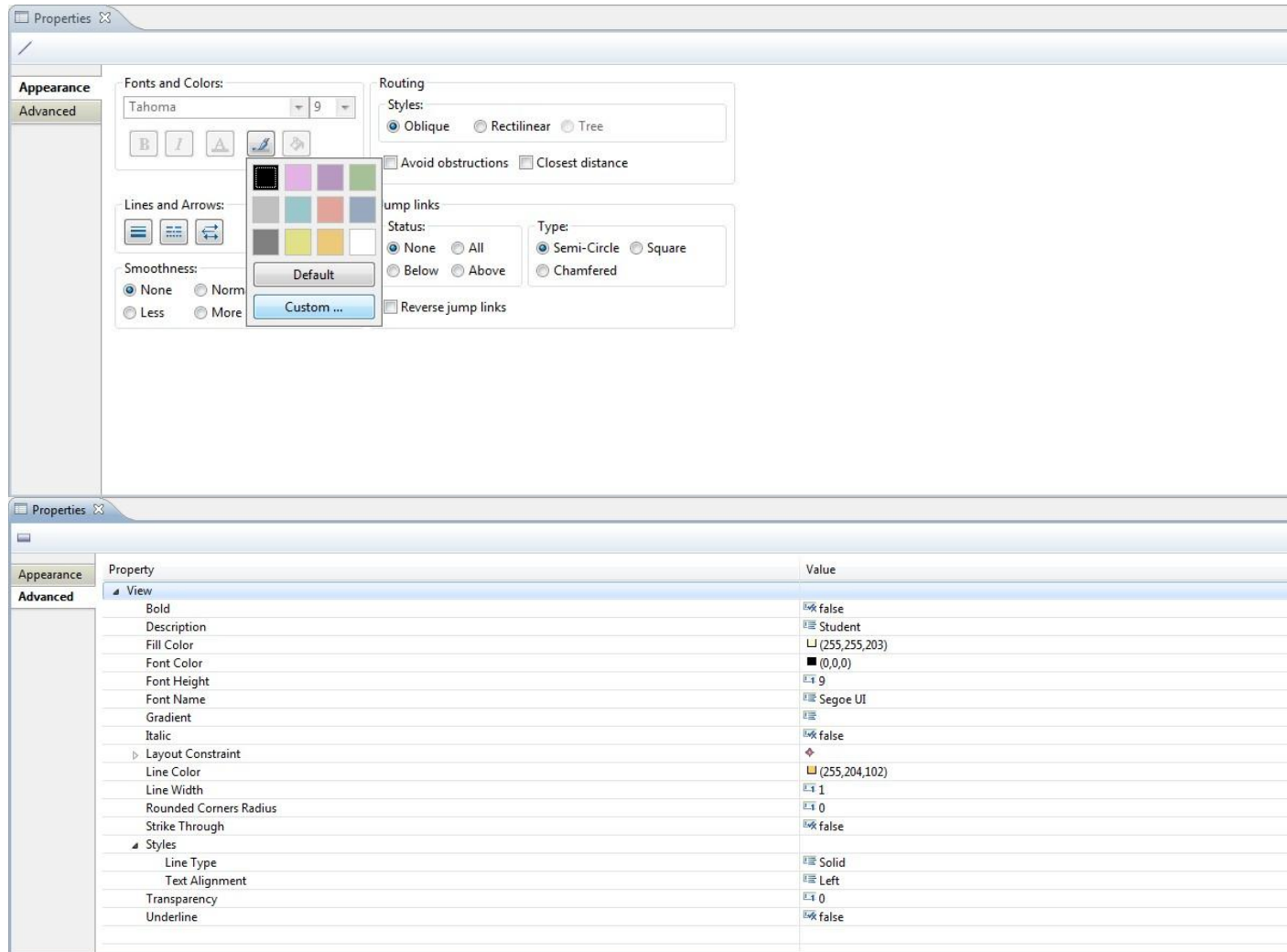


It start as a editor, with shape palette, and properties view.



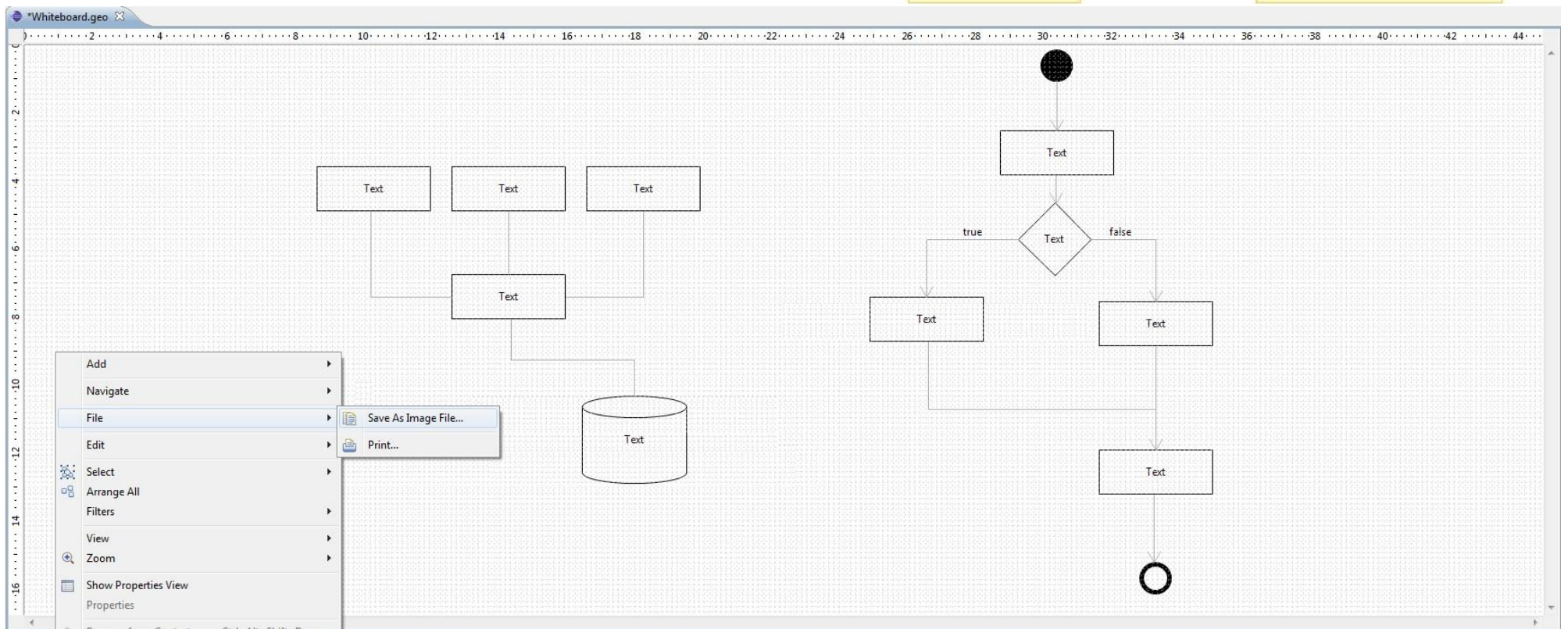
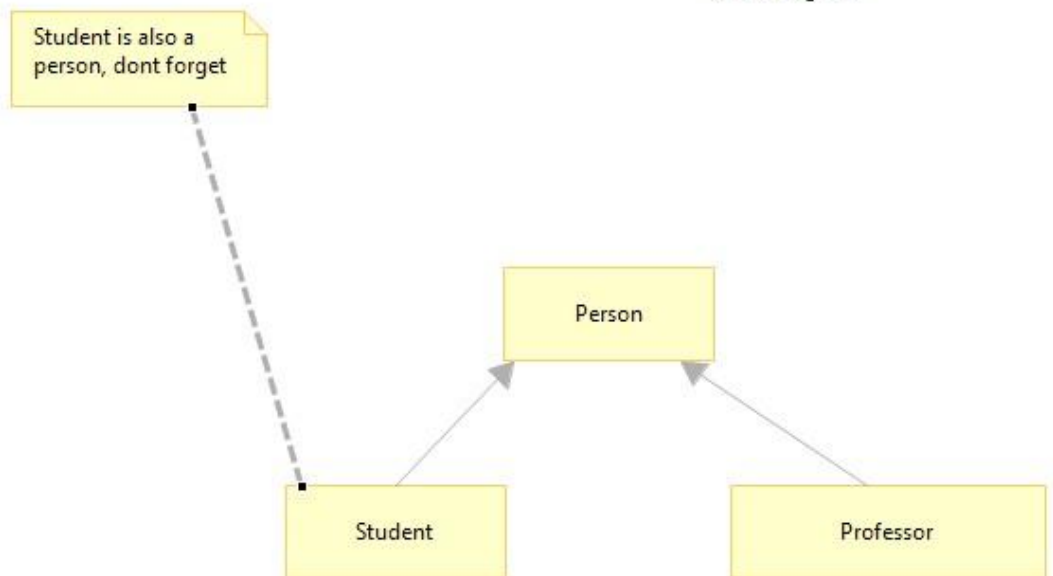
Palette includes 3 groups of shapes: Geometric shapes, Rectangle types and Polygons. It has also line, note and text tool.

With the properties view we can change a lot of element properties and styles:

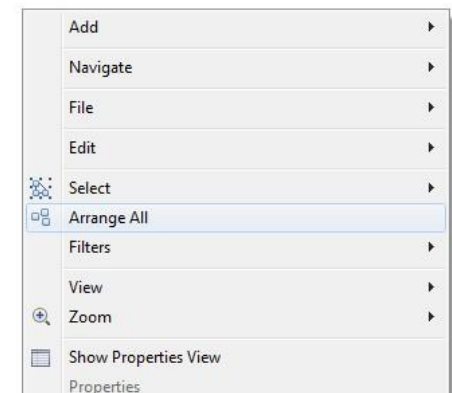
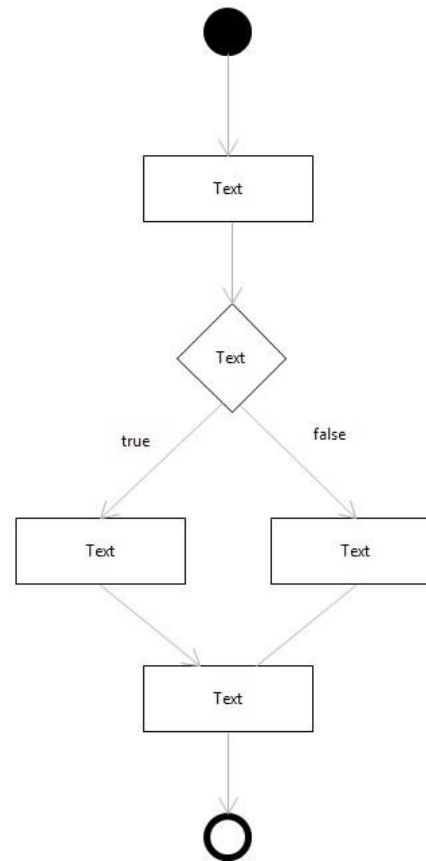
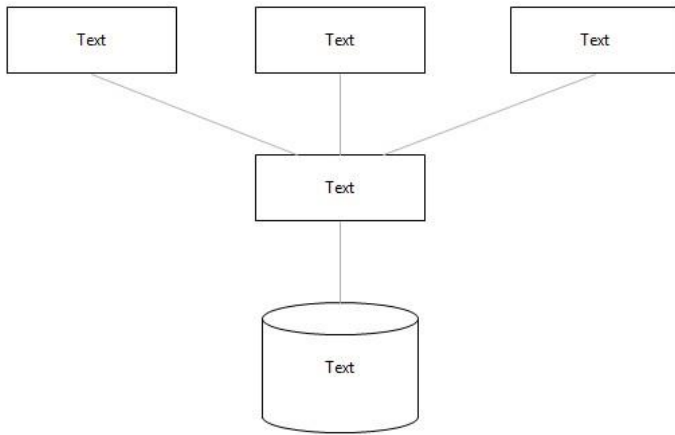


Example usage of whiteboard:

Class diagram







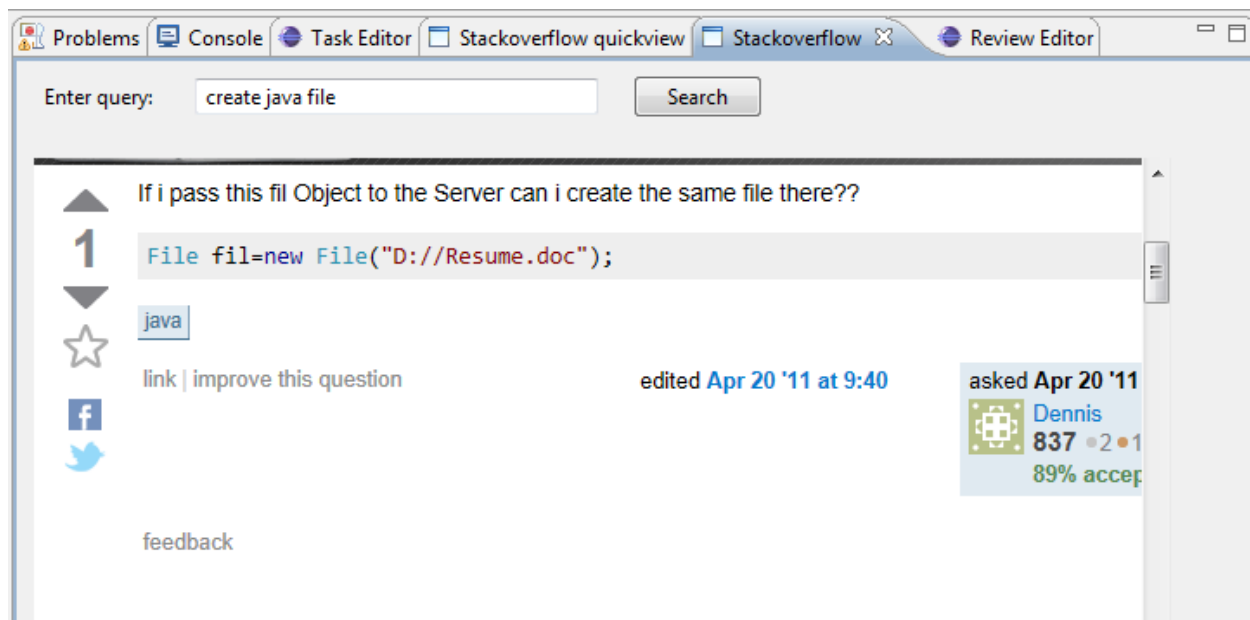
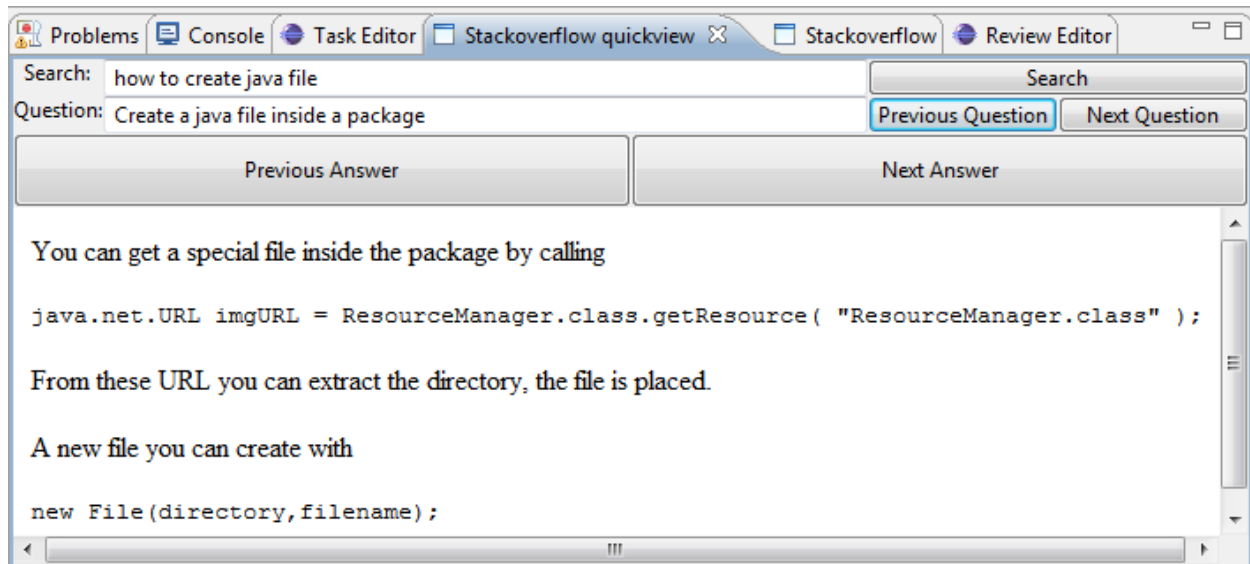
## Additional functionality:

- Auto shapes arrange
- Save whiteboard screen as a image file;



## STACKOVERFLOW API

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# INSTALLATION

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Following section concerns whole installation process, starting from downloading all required files, ending on first-run configuration.

## 1. DOWNLOADING CP PLUGIN FROM SOURCEFORGE.NET

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First, required CP plugin files can be downloaded from sourceforge.net project website:

1. Go to: <https://sourceforge.net/projects/collabprogram/>
2. Follow to section *Files*
3. Choose folder *releases*
4. Download newest release

## 2. ADDING CP PLUGIN TO ECLIPSE

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To install Collaborative Programming plugin, You need to move it to proper location on your hard-drive.

Location to put FILENAME

*Eclipse\_folder \ plugins \*

Where ***eclipse\_folder*** stands for eclipse installation folder, default is:

*C:\Program Files\eclipse*

## 3. REQUIRED DEPENDENCIES

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To run CP plugin properly, you need to install *Graphical Modeling Project Runtime*, which is required by *Whiteboard* module.

GMP is hosted on [www.eclipse.org/gmf/](http://www.eclipse.org/gmf/), you can install it:

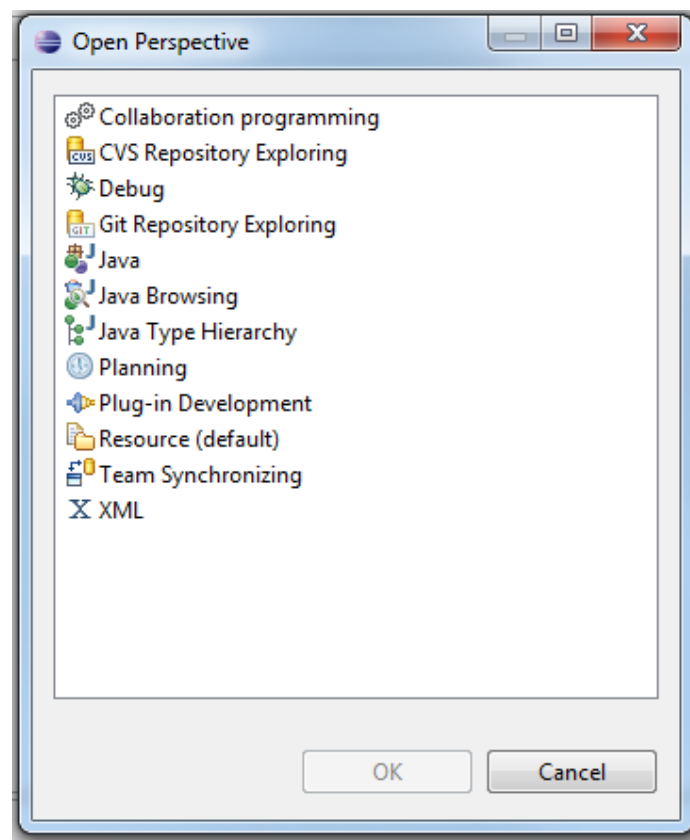
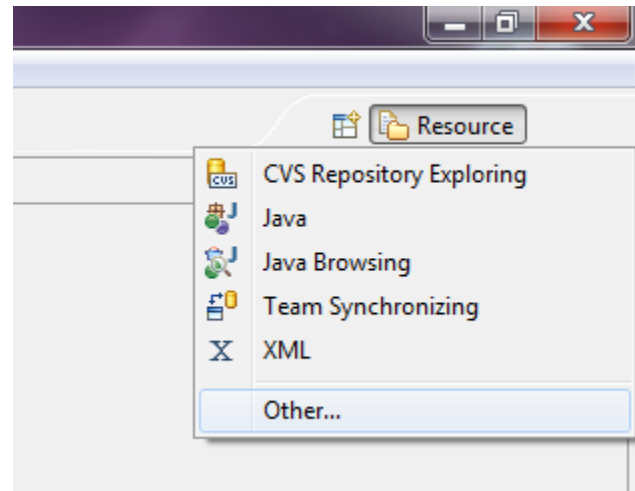
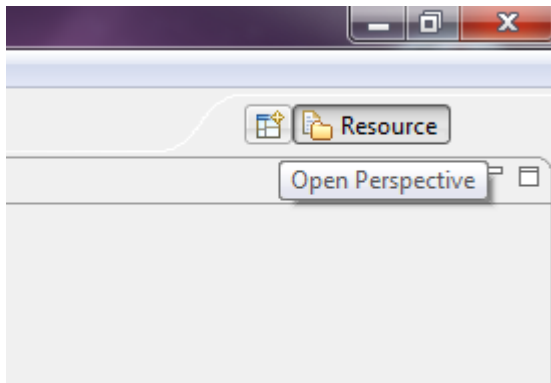
- by downloading Runtime package at the following location:  
<http://www.eclipse.org/modeling/gmp/downloads/?project=gmf-runtime>
- using GMP update site: <http://download.eclipse.org/modeling/gmp/updates/releases/>

## 4. FIRST TIME RUN CONFIGURATION

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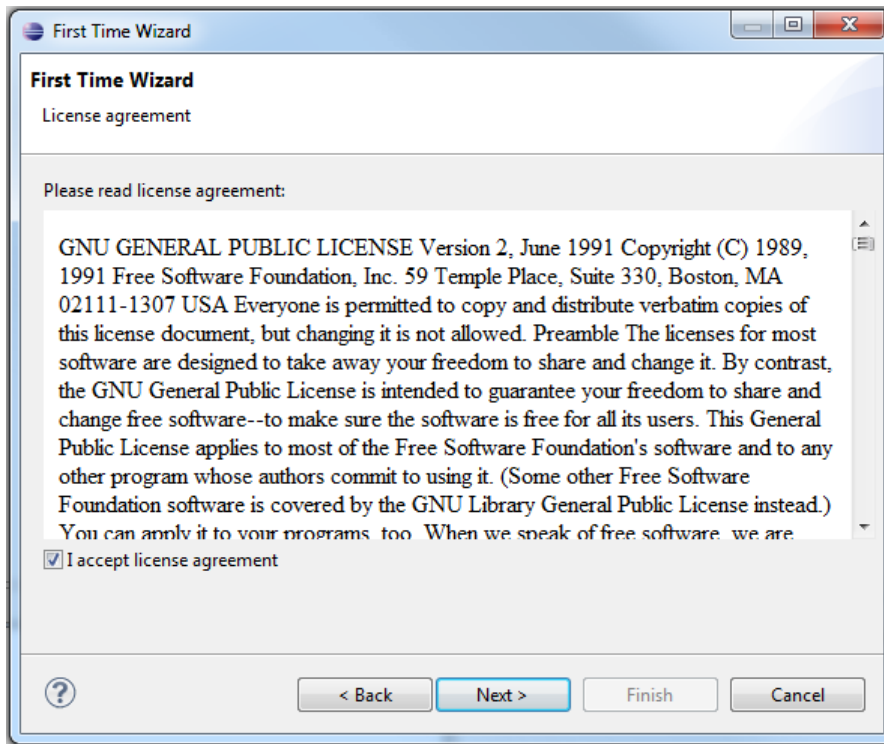
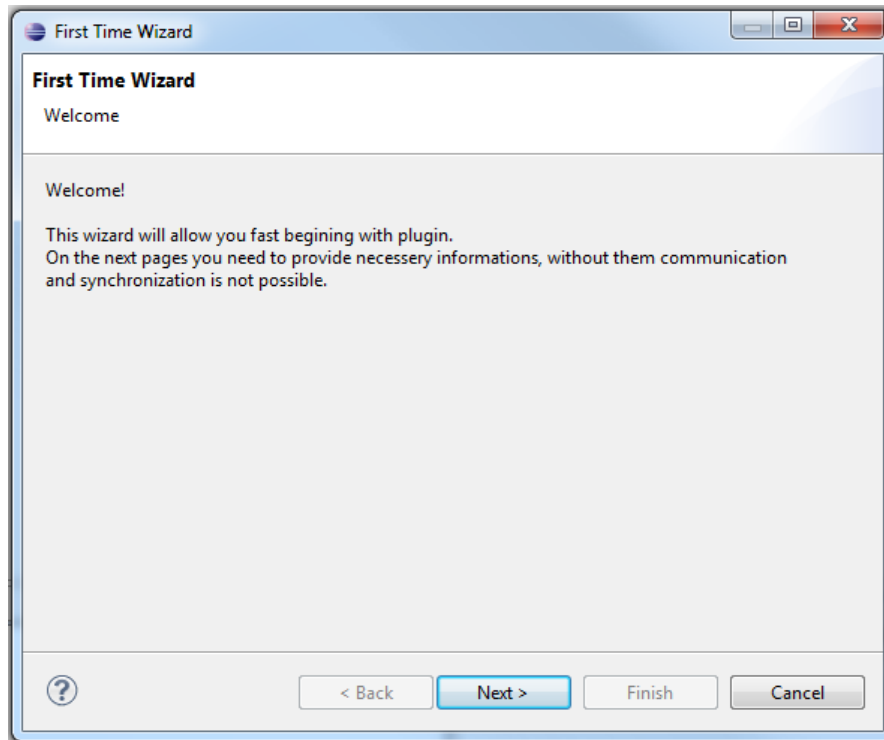
At first run of plugin we must be sure to have some project in Eclipse Workspace. After installation user must configure they account on XMPP server.

**Step 1.** Add Collaborative programming perspective to your Eclipse.



## Step 2. Configure connection settings

On bottom side of Eclipse Window we have Contacts List View. If it your first attempt in using out plugin then I suggest you use First Time Wizard in way to easy configure plugin:



First Time Wizard

### First Time Wizard

Connection settings

☐ Register new account  
☒ Use existing account

Username:

Password:

Repeat password:

Server settings

? < Back Next > Finish Cancel

First Time Wizard

### First Time Wizard

✖ Both password must be exactly the same!

☒ Register new account  
☐ Use existing account

Username:

Password:

Repeat password:

Server settings

? < Back Next > Finish Cancel

