Getting started with g9 Anonymizer

g9 Anonymizer

Version 1.2.0

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Table of Contents

1  How does it work? ................................................................................................................. 3
2  Installation and License ........................................................................................................ 4
   2.1 Requirements .................................................................................................................. 4
       2.1.1 Xcore/Xtext versions ........................................................................................... 4
   2.2 Installation from update site ......................................................................................... 4
   2.3 License ............................................................................................................................ 5
3  Getting started ....................................................................................................................... 8
   3.1 Open Anonymizer Hotel Example project .................................................................... 8
   3.2 Suggested perspective and views .................................................................................. 8
   3.3 Exploring the tasks ......................................................................................................... 10
   3.4 Building the project and running a task ...................................................................... 11
   3.5 Adding your own anonymization task ........................................................................ 13
1 How does it work?

In this getting started section, you will use the 'Anonymizer Hotel Example' project to explore several of the g9 Anonymizer capabilities. This example comes with an embedded Derby database 'hotelsystem' that is automatically created in the wizard which runs various SQL scripts to create the database, indexes and insert sample data. This example project does not represent a real-life example as it has a simplified data structure with a small data set, but it contains various tasks already defined which contains data anonymizations, data deletions and data creations.

The figure shows how g9 Anonymizer works:

- **Database Copy**: Create a copy of your production database.
- **Fetch model**: Import the data structure from a running database (Database Copy) into g9 Anonymizer.
- **g9 Anonymizer**: The data structure displayed in an editor with database information and rule definitions.
- **Anonymization Rules**: Definition of your tasks, be it anonymization rules, inspection reports and/or deletions.
- **Generates**: The Java Anonymization Program application will be automatically created. You can override code.
- **Anonymize**: Run the program against the database that you are going to anonymize. You will get a database that can be used for testing and development purposes.
2 Installation and License

2.1 Requirements

Before working with the g9 Anonymizer:

The g9 Anonymizer tool-set consists of code that runs on Windows and Linux operating systems. The tool set runs as Eclipse plug-ins and requires 2018-09 or newer versions of Eclipse. Start with the Eclipse IDE for Java and DSL Developers package. Otherwise, the Xtext and Xcore plugins must be installed prior to the g9 Anonymizer installation.

Some Eclipse packages (Eclipse IDE for Java and DSL Developers) already have Xcore and Xtext installed. If you choose Eclipse IDE for Java Developers or Eclipse IDE for Enterprise Java Developers, it is not. To install Xcore/Xtext, start Eclipse and select Help > Install New Software ..., which opens the Available Software dialog. Select the eclipse version update site (2019-12) in the Work with: combo box and type Xcore in the filter. Select the EMF - Eclipse Modeling Framework Xcore SDK version shown (1.12) and install it. Do the same for Xtext, type Xtext in the filter and select the Xtext Complete SDK (2.20) and install it.

- Install Eclipse IDE
- The g9 Anonymizer comes with pre-installed JDBC drivers settings using Maven GAV settings for a set of pre-selected database systems. The Derby database is pre-installed. The other drivers need installation, use the [Install] button or use the [Edit] button to configure supported drivers or to add new (See Maintain JDBC Drivers).
- The Maven build process requires a JDK version 8 or later. Make sure to set the default Java execution environment to a valid JDK installation. (Window → Preferences → Java → Installed JREs).
- Install g9 Anonymizer trial or full license.

2.1.1 Xcore/Xtext versions

For Xcore installation, the following plugin versions have been tested:

<table>
<thead>
<tr>
<th>Eclipse version</th>
<th>Xcore</th>
<th>Xtext</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-06-R</td>
<td>1.14.0</td>
<td>2.22.0</td>
</tr>
<tr>
<td>2020-03-R</td>
<td>1.13.0</td>
<td>2.21.0</td>
</tr>
<tr>
<td>2019-12-R</td>
<td>1.12.0</td>
<td>2.20.0</td>
</tr>
<tr>
<td>2019-09-R</td>
<td>1.11.0</td>
<td>2.19.0</td>
</tr>
<tr>
<td>2019-06-R</td>
<td>1.10.0</td>
<td>2.18.0</td>
</tr>
<tr>
<td>2019-03-R</td>
<td>1.9.0</td>
<td>2.17.0</td>
</tr>
<tr>
<td>2018-12-R</td>
<td>1.8.0</td>
<td>2.16.0</td>
</tr>
</tbody>
</table>

2.2 Installation from update site

The g9 Anonymizer is available from the update site: [http://www.esito.no/updatesite/anonymizer](http://www.esito.no/updatesite/anonymizer).

1. Start Eclipse and select from the main menu Help > Install New Software…
2. In the Install dialog, click the Add… button located at the top right of the dialog to add an install site. This brings up the Add Repository dialog.
3. You can install the most recent version from the update site.
   a. In the Name field, type g9 Anonymizer
   b. In the Location field, type http://www.esito.no/updatesite/anonymizer
   c. Click OK to return to the Install dialog.
4. This should automatically select g9 Anonymizer in the Work with field.
5. Once Esito Modeling tools is displayed, select the checkbox and then select the Next button.
6. Click Next again to confirm installation.
7. Read and accept the license agreement. To continue installing, select the checkbox "I accept the terms of the license agreement" and click Finish.
8. When prompted to restart Eclipse, click Restart Now to restart.

2.3 License

g9 Anonymizer requires a valid license, either a trial or a full license. If a license is not installed, a trial license will automatically be installed the first time Eclipse starts and a g9Anonymizer project is created or refreshed. A Message telling about the installation is displayed.

If a license is installed, but is illegal for some reason, an "Install g9 Anonymizer license" message will be displayed the first time Eclipse starts and a g9Anonymizer project is refreshed.

Click Yes to order either a full or trial license.
If you have received a license file (l4j extension), click Browse and select the file in the dialog and click Open. The license fields are displayed including the Expiry date. Click the Finish button to save and close the license dialog.

If you do not have a License or if you want to register your automatically installed trial license, click Get a License.
Fill in the fields. (The fields beginning with an asterisk are mandatory) and then click the Trial License button.

The trial license provides full functionality for 7 days.
3 Getting started

You should start investigating g9 Anonymizer example project in order to understand the functionality of the tools.

3.1 Open Anonymizer Hotel Example project

To open the Anonymizer Hotel Example:

1. Select File > New > Example... which opens the example wizard:

2. Choose Anonymizer Hotel Example. Click Next and Finish. The Anonymizer project AnonymizerHotel is displayed as a node in the Project Explorer view.

3.2 Suggested perspective and views

You may organize the eclipse perspective to suit your preferences. Necessary Views are:

- Package Explorer or Project Explorer
- Properties
- Console
- Problems

To organize your perspective:

1. Select the Open Perspective button on the toolbar and select the Java perspective.
2. Select the menu Window > Show View .. Other. In the Show View dialog, expand the General node and select the Properties, Console and Problems views. (You can hold down the Ctrl button to select multiple views). Press the Open button to select the views.
3. Select the menu Window > Perspective >Customize Perspective ..., go to the Shortcuts tab, select the Anonymizer Project menu and click Apply and Close.
4. Select the menu Window > Perspective >Save Perspective As. In the dialog enter the name Anonymizer and click the Save button.
A fully working example project is imported and opened in the Package or Project Explorer. Expand the project in the Explorer and double-click the `AnonymizerHotel.anonymizer` file. This opens the anonymizer editor with the two editor panes as shown below.

The following views are used by the g9 Anonymizer:

**Package Explorer** or **Project Explorer**: Shows the anonymizer project which contains the following:
- Anonymizer file which defines the anonymizing rules (`AnonymizerHotel.anonymizer`)
- Generated java source code (`src-gen/main/java`)
- Maven `pom.xml` for the project
- Launch files that can build and start generated programs (`AnonymizerHotel_build.launch` and `AnonymizerHotel_run.launch`)
- Derby example database with data and sql files (`data`)

**Properties**: Shows detailed database with data and sql files (`data`)

**Console**: Shows logging of generator runs and can be used to enter command prompts.

**Problems**: Shows Errors and Warnings

**Editor**: Shows Anonymizer editor containing 2 panes. The left pane contains a tree view of the database structure with tables, columns and foreign keys (Database pane). The right pane has a tree view with tasks containing the anonymizing rules (Task pane).
3.3 Exploring the tasks

In this section, you will explore the masking rules and add a condition to an existing masking rule within a task.

1. In the task pane, expand the Anonymize_CUSTOMER node, expand the Customer_PHONE node and select it.

Note that the CUSTOMER_PHONE node has a child node Random and that the property value for the Format/Value is \(+47{\%d}\). This is a constant value (+47) followed by the substitution variable (%d). This causes the data in the PHONE column to be replaced with a random integer (between 10001000 and 99909990) prefaced with the constant +47.

2. Expand the CUSTOMER_NAME node and you will see two child nodes: firstname.txt and lastname.txt. Select the firstname.txt node and press the F3 key and it will open the file in an editor. These files contain lists of first names and last names respectively. Click on the CUSTOMER_NAME node and you will see the Format/Value of %s %s. This instructs the system to replace the data in the NAME column with random first and last names extracted from the specified text files.

3. Expand the other nodes to view the rules. The CUSTOMER_EMAIL will use the masked value of the NAME column and append it with a random value obtained from the email.txt file.

4. We will now look at the data in the CUSTOMER table. Right-click the CUSTOMER table in the Database pane and select the menu option 'Show Table'. This opens a 'Show Table' view displaying all columns and values.

5. You will now add a Where condition for the masking of the Customer columns. In the Task pane, right-click on the Anonymize_CUSTOMER node and select Add > Where. This creates a Where node. Right-click on the Where node and select Add > Condition.
6. Click on the Condition node and enter the following in the properties page:

<table>
<thead>
<tr>
<th>Column</th>
<th>CUSTOMERNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator</td>
<td>Less than or equal</td>
</tr>
<tr>
<td>Value</td>
<td>1000243</td>
</tr>
</tbody>
</table>

7. Save the editor by pressing Ctrl + S. You have now added a where condition that limits the customer records that will be anonymized.

### 3.4 Building the project and running a task

Each time changes are saved to the anonymizer file, the generator starts and generates a complete program reflecting all your defined rules. (If the Project > Build Automatically is selected) The Console View displays the output of the generation process.

To generate the anonymization java files and run a task, do the following:

1. Select the AnonymizerHotel project.
2. Select Clean... from the Project menu and press the Clean button.
3. The application code is regenerated and you can inspect it in the Project Explorer. Expand the src-gen/ main/java directory and open the example.anonymizer.anonymize package. If you would open the Anonymizer_CUSTOMER.java file, you would notice the getWhere() method that defines the Where condition that you added.
4. A pre-defined launch script runs the generated program, simply right-click the AnonymizerHotel_run.launch file and select Run As > AnonymizerHotel_run.
5. The program is started and starts the Anonymizer Console in the Console View.
6. Place the cursor at the > and write the command trace and press the Enter key.
7. Then enter run anonymize (the task name) and press the Enter key. This command performs all the anonymizations specified under the task anonymize and the program displays the sql commands performed on the database.
Enter quit to stop the console program.

Inspect the data in the database. You can use the Refresh button if you already have a CUSTOMER tab open, otherwise right-click the CUSTOMER table and select the Show Table menu. Note all of the changes are performed on PHONE, NAME, EMAIL and CREDITCARD for your specified range of customers.
1. To see the hotel names prior to the anonymization, right-click the HOTEL node in the database pane and select 'Show Table'. A new 'Hotel' tab is created.
2. You will now add the Anonymization mask for the hotel NAME attribute:
   a. Select the "Anonymize" task in the task pane. This ensures the added anonymization is added to that task.
   b. Expand the HOTEL node in the database pane and right-click the NAME node.
   c. Choose Anonymize Column > Mask
   
   ![Anonymize Column screenshot]

   d. Enter "FixHotelName" and press OK.

   ![Add Anonymize screenshot]
3. Next you will define the Hotel naming rule. This rule will replace the name with a random name from a text file and add the suffix "International Hotel":
   a. Click the HOTEL_NAME node in your new task.
   b. In the Property view enter the following

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format / Value</td>
<td>%s</td>
<td>Interna... International Hotel</td>
</tr>
<tr>
<td>Assign unique</td>
<td>Checked</td>
<td>Checking this option ensures that all entries are unique.</td>
</tr>
</tbody>
</table>

   The %s variable is replaced with the random text entry followed by the constant text 'International Hotel'.

   c. Right-click the HOTEL_NAME node and choose Add > File

   4. Next you will specify the file "lastname.txt" containing multiple text entries of names.
   a. Click the new <File> node
   b. In the Property view, click the File property and click the browse button at the far right. This opens up a Select File dialog.
   c. Select the file src/main/resources/lastname.txt and press OK.
   d. Save your changes to rebuild the application. (This assumes the option Project > Build Automatically is checked. If not, select Project > Clean and then click the Clean button)
5. You will now run the new anonymization task within the Console view.
   a. Right-click on the "AnonymizerHotel_run.launch" in the project explorer
   b. Choose Run As > AnonymizerHotel_run. The Console view is displayed.
   c. Click in the Console view to position the cursor in front of the > prompt and type `run FixHotelName`
   d. Hit the enter key.

6. To verify the results of running your new anonymization task:
   a. If the HOTEL tab is already displayed, click the Refresh icon located at the top right of the view
b. If the HOTEL tab is closed, right-click HOTEL in the database pane and then select Show Table.