



Development, landscape, and release

Eric Verbeek

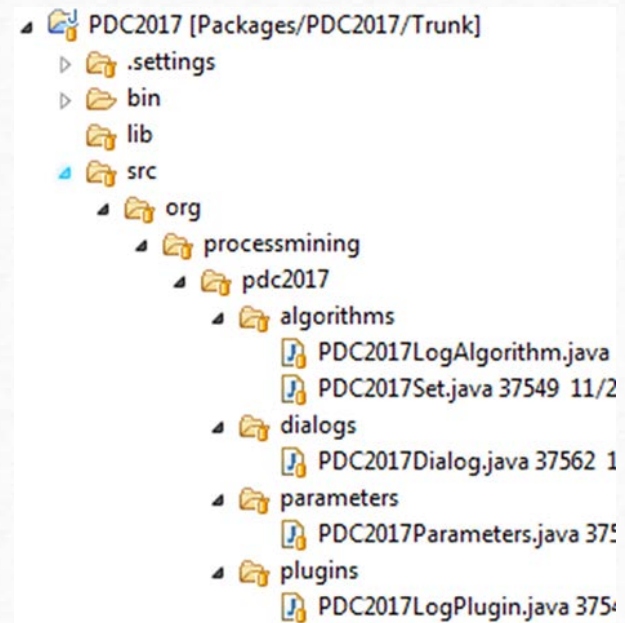
Development

Using PDC2017 package as example



Package

- Algorithms
- Connections
- Dialogs
- Models
- Parameters
- Plugins



Plug-ins

Wrappers for algorithms

- Parameterized headless
- Default headless
 - GUI-aware

```
EventBasedP... PDC2017TestP... PDC2017LogI... PDC2017LogPl... PDC2017Par...
1 package org.processmining.pdc2017.plugins;
2
3 import org.deckfour.uitopia.api.event.TaskListener.InteractionResult;
12
13 @Plugin(name = "Create PDC 2017 Log", parameterLabels = {}, returnLabels = { "PDC 20
14 public class PDC2017LogPlugin extends PDC2017LogAlgorithm {
15
16     @UITopiaVariant(affiliation = UITopiaVariant.EHV, author = "H.M.W. Verbeek", ema
17     @PluginVariant(variantLabel = "Default", requiredParameterLabels = { })
18     public XLog run(UIPluginContext context) throws Exception {
19         PDC2017Parameters parameters = new PDC2017Parameters();
20         PDC2017Dialog dialog = new PDC2017Dialog(parameters);
21         InteractionResult result = context.showWizard("Select log to create", true,
22         if (result != InteractionResult.FINISHED) {
23             context.getFutureResult(0).cancel(true);
24             return null;
25         }
26         return apply(context, parameters);
27     }
28 }
```

Parameters

Values needed for running the algorithm
from start to end

- Which collection?
(TRAIN, CAL1, CAL2, TEST)
- Which number?
(1..10)

```
1 package org.processmining.pdc2017.parameters;
2
3 import org.processmining.pdc2017.algorithms.PDC2017Set;
4
5 public class PDC2017Parameters {
6
7     private PDC2017Set set;
8     private int nr;
9
10    public PDC2017Parameters() {
11        set = PDC2017Set.TRAIN;
12        nr = 1;
13    }
14
15    public PDC2017Set getSet() {
16        return set;
17    }
18
19    public void setSet(PDC2017Set set) {
20        this.set = set;
21    }
22
23    public int getNr() {
24        return nr;
25    }
26
27    public void setNr(int nr) {
28        this.nr = nr;
29    }
30 }
```


Dialog

Allows user to set values

Select log to create

Select log collection

Calibration log 1
Calibration log 2
Test log
Training log

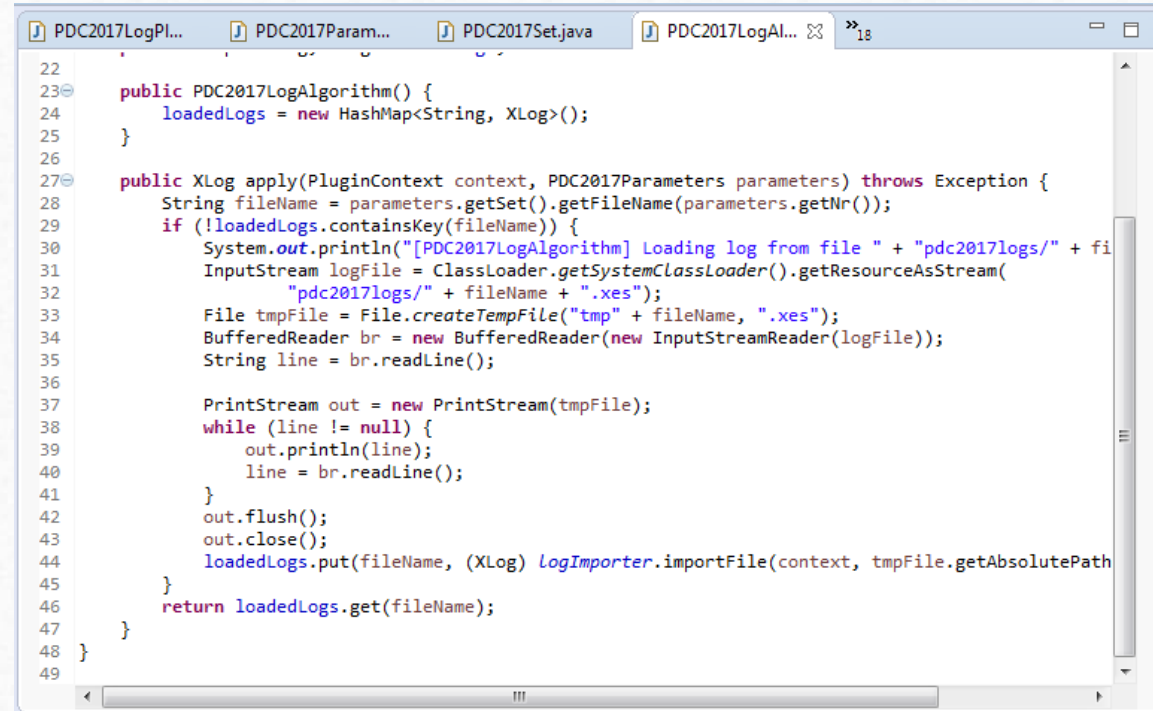
Select log number

1
2
3
4
5
6
7
8
9
10

Algorithm

Doing the heavy lifting

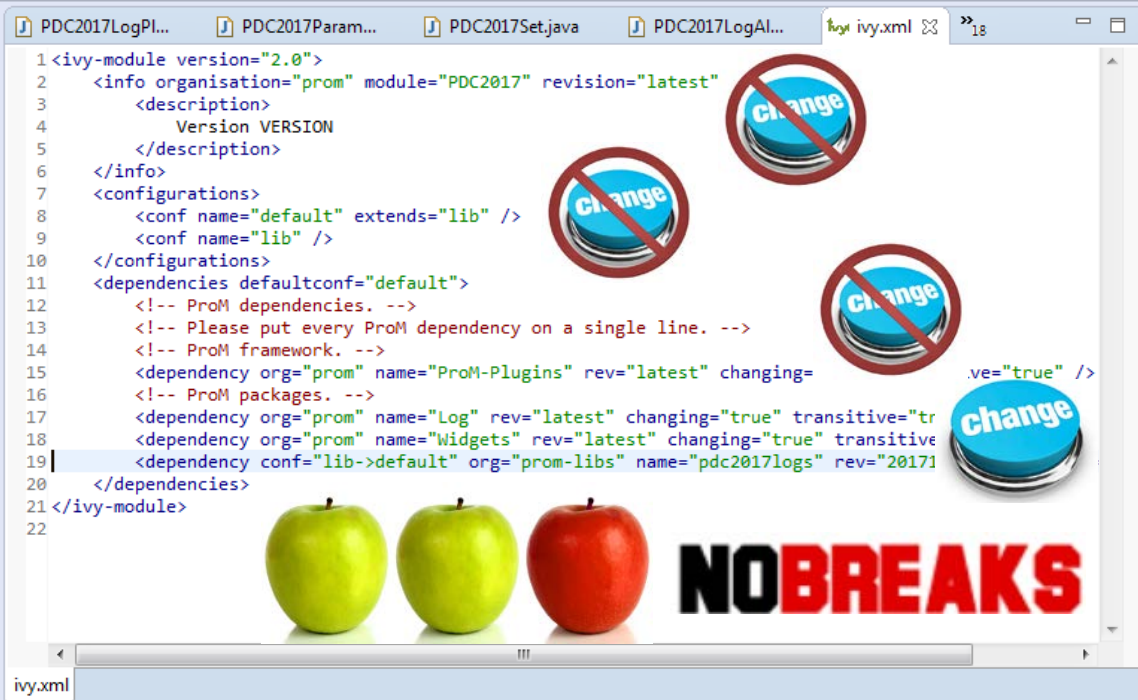
May have a plug-in context



```
22
23 public PDC2017LogAlgorithm() {
24     loadedLogs = new HashMap<String, XLog>();
25 }
26
27 public XLog apply(PluginContext context, PDC2017Parameters parameters) throws Exception {
28     String fileName = parameters.getSet().getFileName(parameters.getNr());
29     if (!loadedLogs.containsKey(fileName)) {
30         System.out.println("[PDC2017LogAlgorithm] Loading log from file " + "pdc2017logs/" + fi
31         InputStream logFile = ClassLoader.getSystemClassLoader().getResourceAsStream(
32             "pdc2017logs/" + fileName + ".xes");
33         File tmpFile = File.createTempFile("tmp" + fileName, ".xes");
34         BufferedReader br = new BufferedReader(new InputStreamReader(logFile));
35         String line = br.readLine();
36
37         PrintStream out = new PrintStream(tmpFile);
38         while (line != null) {
39             out.println(line);
40             line = br.readLine();
41         }
42         out.flush();
43         out.close();
44         loadedLogs.put(fileName, (XLog) logImporter.importFile(context, tmpFile.getAbsolutePath
45     }
46     return loadedLogs.get(fileName);
47 }
48 }
49
```


Dependencies

- ProM framework (ProM-Plugins)
- ProM packages (Log, Widgets)
- Maven2 repository
- ProM libraries (pdc2017logs)



```
1 <ivy-module version="2.0">
2   <info organisation="prom" module="PDC2017" revision="latest"
3     <description>
4       Version VERSION
5     </description>
6   </info>
7   <configurations>
8     <conf name="default" extends="lib" />
9     <conf name="lib" />
10  </configurations>
11  <dependencies defaultconf="default">
12    <!-- ProM dependencies. -->
13    <!-- Please put every ProM dependency on a single line. -->
14    <!-- ProM framework. -->
15    <dependency org="prom" name="ProM-Plugins" rev="latest" changing=
16      <!-- ProM packages. -->
17    <dependency org="prom" name="Log" rev="latest" changing="true" transitive="tr
18    <dependency org="prom" name="Widgets" rev="latest" changing="true" transitive
19    <dependency conf="lib->default" org="prom-lib" name="pdc2017logs" rev="2017
20  </dependencies>
21 </ivy-module>
22
```

The screenshot shows an IDE window titled 'ivy.xml' with the above XML code. The code defines an Ivy module for 'PDC2017' with a 'latest' revision. It includes configurations for 'default' and 'lib'. The dependencies section lists 'ProM-Plugins', 'Log', 'Widgets', and 'pdc2017logs'. The code is annotated with several 'change' buttons (some with a red 'X' over them) and a 'NOBREAKS' text at the bottom right. The 'NOBREAKS' text is in large, bold, black and red letters. Below the text are three apples: two green and one red.

Resolving libraries for Nightly Builds and Releases (where there is no Ivy)

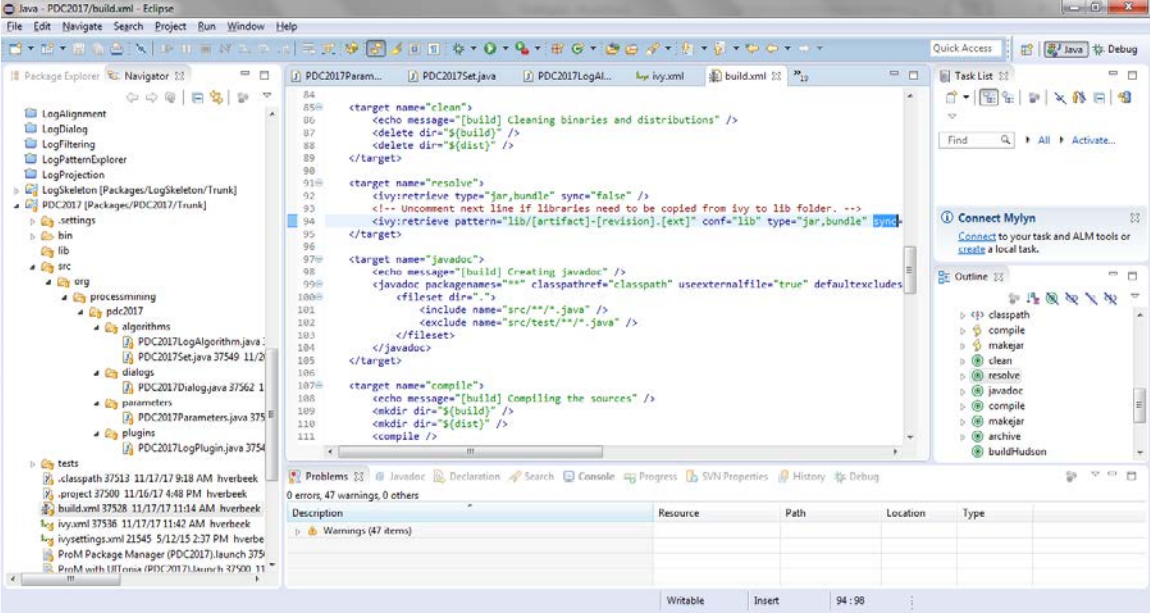
1. No libraries:
Comment out
2. Libraries, empty lib folder:
Uncomment, set sync="true"
3. Libraries, non-empty lib folder:
Uncomment, set sync="false"



```
84
85 <target name="clean">
86   <echo message="[build] Cleaning binaries and distributions" />
87   <delete dir="${build}" />
88   <delete dir="${dist}" />
89 </target>
90
91 <target name="resolve">
92   <ivy:retrieve type="jar,bundle" sync="false" />
93   <!-- Uncomment next line if libraries need to be copied from ivy to lib folder. -->
94   <ivy:retrieve pattern="lib/[artifact]-[revision].[ext]" conf="lib" type="jar,bundle" sync="
95 </target>
96
97 <target name="javadoc">
98   <echo message="[build] Creating javadoc" />
99   <javadoc packagenames="*" classpathref="classpath" useexternalfile="true" defaultexcludes
100   <fileset dir=".">
101     <include name="src/**/*.java" />
102     <exclude name="src/test/**/*.java" />
103   </fileset>
104 </javadoc>
105 </target>
106
107 <target name="compile">
108   <echo message="[build] Compiling the sources" />
109   <mkdir dir="${build}" />
110   <mkdir dir="${dist}" />
111   <compile />
```

Landscape

Local workstation, SVN+Trac, Hudson, Webserver



SVN repository

<https://svn.win.tue.nl/repos/prom>



























- Documentation
- Libraries
- Packages
- Releases

File	Extension	Revision	Author	Size	Date	Lock
Declare		16697	hverbeek		11/4/2014 12:23:54 PM	
DeclareMonitorClient		2635	fmaggi		8/5/2011 1:45:23 PM	
Documentation		38218	hverbeek		2/28/2018 11:22:19 AM	
EfficientStorage		36563	bfvdonge		8/25/2017 10:31:11 PM	
Framework		34771	hverbeek		3/30/2017 2:07:36 PM	
HudsonConfig		176	bfvdonge		12/17/2010 1:23:26 PM	
JGraph4ProM		16596	bfvdonge		10/25/2014 4:28:32 PM	
Libraries		38336	hverbeek		3/12/2018 11:04:15 AM	
MoBuConClient		20784	fmaggi		4/25/2015 6:14:09 PM	
Nightly		38384	promhudson		3/19/2018 2:05:00 AM	
OpenXES		37722	hverbeek		12/12/2017 3:45:45 PM	
Packages		38382	bhompes		3/17/2018 3:47:58 PM	
Papers		7664	rmans		12/30/2012 6:05:13 PM	
ProcessCubes		19557	hverbeek		3/13/2015 10:42:45 AM	
RapidProM		21753	abolt		5/20/2015 12:17:58 PM	
Releases		38380	promhudson		3/16/2018 8:40:45 AM	
SandBox		9247	tmamaliga		6/12/2013 11:32:36 AM	
Settings		30353	hverbeek		9/8/2016 3:10:04 PM	
TestSuite		31527	hverbeek		10/21/2016 2:01:24 PM	
TreeReplayC		13363	bfvdonge		5/7/2014 2:43:22 PM	
UITopia		28465	hverbeek		5/24/2016 10:02:06 AM	
XESame		37993	jbuijs		1/17/2018 5:55:15 PM	
XPort		38345	mleemans		3/12/2018 1:52:32 PM	
XTract		36780	dfahland		9/11/2017 12:38:59 PM	

SVN Documentation

[https://svn.win.tue.nl/repos/prom/
Documentation](https://svn.win.tue.nl/repos/prom/Documentation)

Required for Established packages

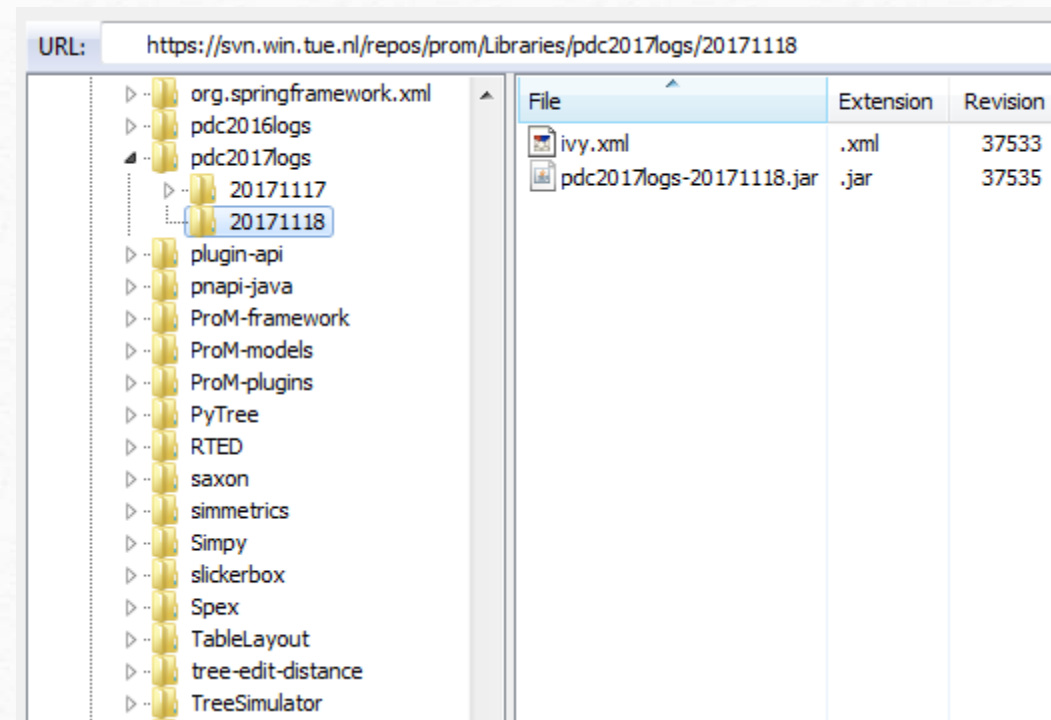
File	Extension	Revision	Author
 Package XPDImportExport.docx	.docx	21	bfdvonge
 Package XPDImportExport.pdf	.pdf	21	bfdvonge
 Package YAWL.docx	.docx	2321	hverbeek
 Package YAWL.pdf	.pdf	2322	hverbeek
 Package YAWLReplay.docx	.docx	2321	hverbeek
 Package YAWLReplay.pdf	.pdf	2322	hverbeek
 Package_StochasticPetriNets.pdf	.pdf	8451	hverbeek
 PackageGeneticMiner.docx	.docx	21	bfdvonge
 PackageGeneticMiner.pdf	.pdf	21	bfdvonge
 PDC2016-1.0.pdf	.pdf	37635	hverbeek
 PDC2017-1.0.pdf	.pdf	37635	hverbeek
 Plugin Uncertainty Marker Manual.pdf	.pdf	30533	hverbeek
 PnmlExport plug-in.docx	.docx	21	bfdvonge
 PnmlExport plug-in.pdf	.pdf	21	bfdvonge
 PnmlImport plug-in.docx	.docx	21	bfdvonge
 PnmlImport plug-in.pdf	.pdf	21	bfdvonge
 PPM - documentation.pdf	.pdf	9650	hverbeek
 Projected Recall and Precision.pdf	.pdf	32679	hverbeek
 ProM Overview.pdf	.pdf	21	bfdvonge
 ProM Overview.vsd	.vsd	21	bfdvonge
 ServiceDiscovery.pdf	.pdf	14729	hverbeek
 SimpleLogOperations - documentation.pdf	.pdf	9650	hverbeek
 TestBed-plugin.docx	.docx	21	bfdvonge
 TestBed-plugin.pdf	.pdf	21	bfdvonge
 TSMiner plug-in.docx	.docx	21	bfdvonge
 TSMiner plug-in.pdf	.pdf	21	bfdvonge

SVN Libraries

[https://svn.win.tue.nl/repos/prom/
Libraries](https://svn.win.tue.nl/repos/prom/Libraries)

- Maikel Leemans
- Eric Verbeek

For libraries not included in Maven2
repository



SVN Packages

[https://svn.win.tue.nl/repos/prom/
Packages](https://svn.win.tue.nl/repos/prom/Packages)

Folder containing package sources

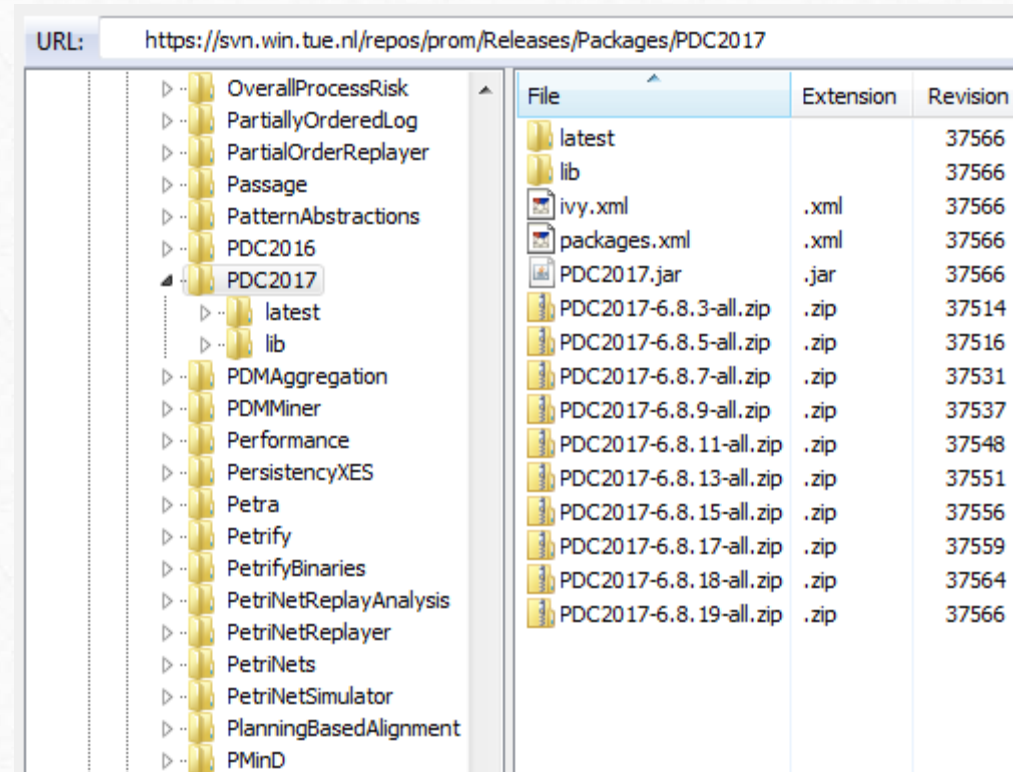
URL: <https://svn.win.tue.nl/repos/prom/Packages/PDC2017/Trunk>

File	Extension	Revision
lib		37513
src		37562
tests		32362
.classpath	.classpath	37513
.project	.project	37500
build.xml	.xml	37528
ivy.xml	.xml	37536
ivysettings.xml	.xml	21545
ProM Package Manager (PDC2017).launch	.launch	37500
ProM with UITopia (PDC2017).launch	.launch	37500
ProM.ini	.ini	20129

SVN Releases

[https://svn.win.tue.nl/repos/prom/
Releases/Packages](https://svn.win.tue.nl/repos/prom/Releases/Packages)

Folder containing released packages



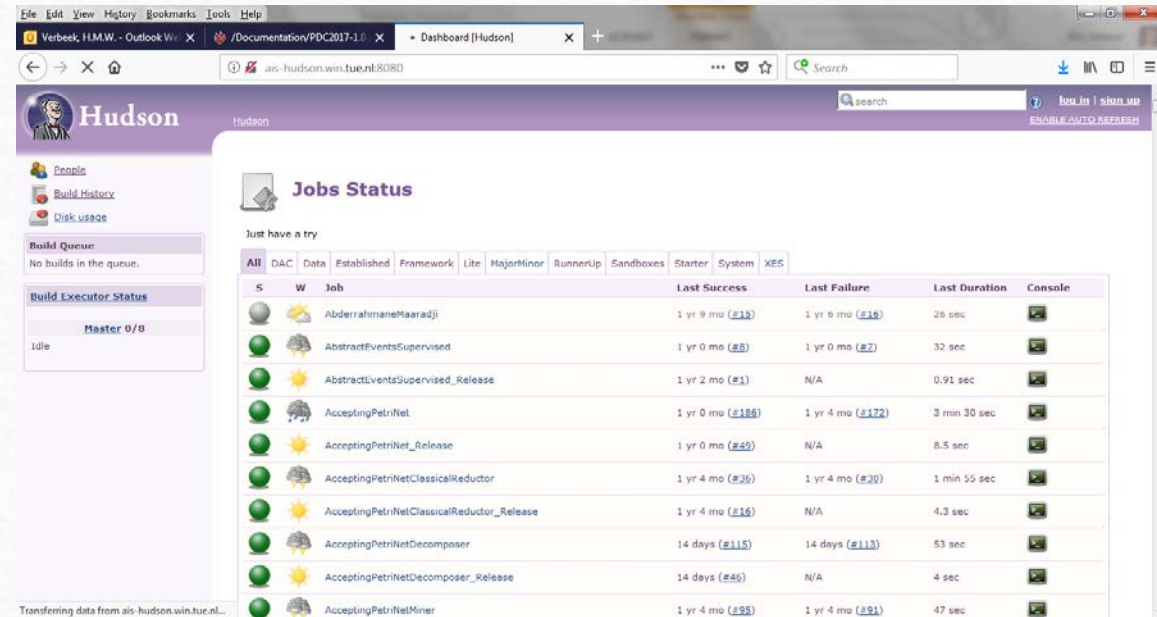
File	Extension	Revision
latest		37566
lib		37566
ivy.xml	.xml	37566
packages.xml	.xml	37566
PDC2017.jar	.jar	37566
PDC2017-6.8.3-all.zip	.zip	37514
PDC2017-6.8.5-all.zip	.zip	37516
PDC2017-6.8.7-all.zip	.zip	37531
PDC2017-6.8.9-all.zip	.zip	37537
PDC2017-6.8.11-all.zip	.zip	37548
PDC2017-6.8.13-all.zip	.zip	37551
PDC2017-6.8.15-all.zip	.zip	37556
PDC2017-6.8.17-all.zip	.zip	37559
PDC2017-6.8.18-all.zip	.zip	37564
PDC2017-6.8.19-all.zip	.zip	37566

Hudson

<http://ais-hudson.win.tue.nl:8080/>

Continuous build server

- Builds
- Releases
- Master Package Lists
- Utilities



The screenshot shows the Hudson web interface in a browser window. The address bar displays 'ais-hudson.win.tue.nl:8080'. The page has a purple header with the 'Hudson' logo and navigation links like 'People', 'Build History', and 'Disk usage'. The main content area is titled 'Jobs Status' and features a table of build jobs. The table includes columns for job status (S), job name (W), job name (Job), last success, last failure, last duration, and console output. The jobs listed include 'AbderrahmaneMaaradji', 'AbstractEventsSupervised', 'AbstractEventsSupervised_Release', 'AcceptingPetrinet', 'AcceptingPetrinet_Release', 'AcceptingPetrinetClassicalReducer', 'AcceptingPetrinetClassicalReducer_Release', 'AcceptingPetrinetDecomposer', 'AcceptingPetrinetDecomposer_Release', and 'AcceptingPetrinetMiner'. The status of each job is indicated by a green circle with a white 'S' or a yellow circle with a white 'W'.

S	W	Job	Last Success	Last Failure	Last Duration	Console
S	W	AbderrahmaneMaaradji	1 yr 9 mo (#13)	1 yr 6 mo (#16)	26 sec	[icon]
S	W	AbstractEventsSupervised	1 yr 0 mo (#8)	1 yr 0 mo (#2)	32 sec	[icon]
S	W	AbstractEventsSupervised_Release	1 yr 2 mo (#1)	N/A	0.91 sec	[icon]
S	W	AcceptingPetrinet	1 yr 0 mo (#185)	1 yr 4 mo (#172)	3 min 30 sec	[icon]
S	W	AcceptingPetrinet_Release	1 yr 0 mo (#45)	N/A	6.5 sec	[icon]
S	W	AcceptingPetrinetClassicalReducer	1 yr 4 mo (#36)	1 yr 4 mo (#30)	1 min 55 sec	[icon]
S	W	AcceptingPetrinetClassicalReducer_Release	1 yr 4 mo (#16)	N/A	4.3 sec	[icon]
S	W	AcceptingPetrinetDecomposer	14 days (#115)	14 days (#113)	53 sec	[icon]
S	W	AcceptingPetrinetDecomposer_Release	14 days (#46)	N/A	4 sec	[icon]
S	W	AcceptingPetrinetMiner	1 yr 4 mo (#95)	1 yr 4 mo (#91)	47 sec	[icon]

Hudson Builds I

<http://ais-hudson.win.tue.nl:8080/view/Established/job/PDC2017/>

- Automatic
- Manual (requires log in)

Sends e-mail if build fails.

Shows included libraries as artifacts.

Upstream job: PDC2017_Release

The screenshot shows the Hudson web interface for a job named 'PDC2017'. The top navigation bar includes the Hudson logo and the breadcrumb 'Hudson > Established > PDC2017'. On the left, a sidebar contains links for 'Back to Main Dashboard', 'Status', 'Changes', 'Workspace', 'Build Now', 'Delete Job', 'Configure', 'Set Next Build Number', 'Javadoc', 'Coverage Report', and 'Subversion Polling Log'. The main content area is titled 'Job PDC2017' and features several sections: 'Javadoc', 'Coverage Report', 'Workspace', 'Artifact(s) of the Last Successful Build' (listing files like ivy.xml, pdc2017logs-20171118.jar, packages.xml, PDC2017-6.8.20-all.zip, and PDC2017.jar), 'Recent Changes', and 'Latest Test Results (no failures)'. A 'Build History' table is also present, showing a list of recent builds with their numbers, timestamps, and sizes.

#	Build	Time	Size
#20	Nov 20, 2017 11:04:54 AM	907KB	
#19	Nov 20, 2017 11:03:23 AM	907KB	
#18	Nov 20, 2017 9:54:06 AM	167KB	
#17	Nov 20, 2017 9:53:33 AM	159KB	
#16	Nov 20, 2017 9:37:54 AM	166KB	
#15	Nov 20, 2017 9:37:18 AM	159KB	
#14	Nov 20, 2017 9:33:47 AM	167KB	

Hudson Builds II

- Checks changes on downstream (ProM, not Hudson) **Established** packages
- Build fails if downstream build of downstream package fails
- Protection from upstream changes (upstream developer is responsible)



Hudson Builds III

Make changes **the royal way**:

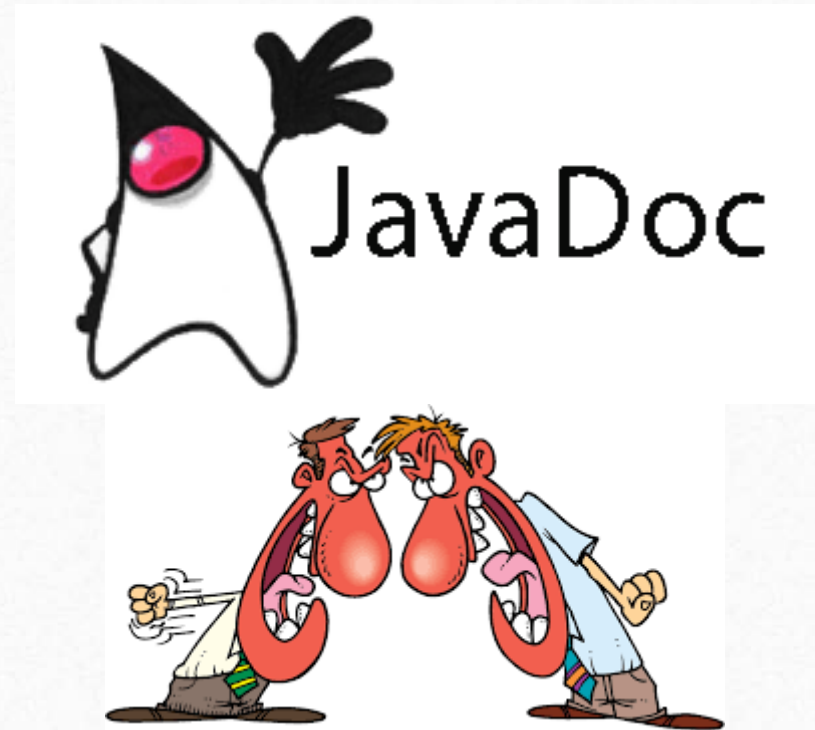
1. Add the new implementation next to the old implementation
2. Inform all downstream developers that there is a new implementation, and how to change to it in their package
3. Wait for these downstream packages to have changed to the new implementation
4. Remove the old implementation



Hudson Builds IV

Javadoc quirk

- Cannot (always) handle a library that contains multiple classes with the same name
- Downstream build may fail as a result
- If possible, avoid classes with the same name
 - Otherwise, split package



Hudson Releases

http://ais-hudson.win.tue.nl:8080/view/Established/job/PDC2017_Release/

Manual (requires log in)

Copies **latest successful build** to
SVN Releases folder

Clears workspace and triggers new build for
package to fill workspace again

Webserver updates package for Nightly
Build within an hour

The screenshot shows the Hudson web interface for the 'PDC2017_Release' job. The top navigation bar includes the Hudson logo and the breadcrumb 'Hudson » Established » PDC2017_Release'. A left sidebar contains links: 'Back to Main Dashboard', 'Status', 'Changes', 'Workspace', 'Build Now', 'Delete Job', 'Configure', and 'Set Next Build Number'. The main content area is titled 'Job PDC2017_Release' and features icons for 'Workspace', 'Recent Changes', and 'Latest Console output'. Below these are sections for 'Downstream Jobs' (listing 'PDC2017') and 'Cascading Parent' (listing 'NewPackage_Release'). At the bottom is a 'Permalinks' section. A 'Build History' table is displayed, showing the last 11 builds with their IDs, timestamps, and sizes.

Build History (trend)		
#11	Nov 20, 2017 11:04:41 AM	6KB
#10	Nov 20, 2017 11:03:11 AM	6KB
#9	Nov 20, 2017 9:53:51 AM	6KB
#8	Nov 20, 2017 9:37:45 AM	6KB
#7	Nov 20, 2017 9:33:37 AM	6KB
#5	Nov 17, 2017 11:43:22 AM	6KB
#4	Nov 20, 2017 9:19:05 AM	6KB
#3	Nov 17, 2017 9:39:17 AM	6KB

Hudson Master Package Lists

<http://ais-hudson.win.tue.nl:8080/view/Established/>



- Established
- RunnerUp
(no protection from upstream changes)
- Starter
(not installed by default)
- Sandboxes
(no releases)

The screenshot shows the Hudson web interface. The top navigation bar includes the Hudson logo and the text 'Hudson > Established'. On the left sidebar, there are links for 'New Job', 'Manage Hudson', 'Build History', 'Configure View', 'Delete View', 'New View', 'My Views', 'Restart Safely', and 'Disk usage'. Below these are sections for 'Build Queue' (showing 'No builds in the queue.') and 'Build Executor Status' (showing 'Master 0/8' and 'Idle'). The main content area is titled 'Jobs Status' and features a table with tabs for 'All', 'DAC', 'Data', 'Established' (selected), 'Framework', 'Lite', 'MajorMinor', and 'Run'. The table has columns 'S', 'W', and 'Job'. It lists eight jobs, each with a status icon (green circle for 'S' or grey cloud with rain for 'W') and a name: 'AcceptingPetriNet', 'AcceptingPetriNet_Release', 'AcceptingPetriNetClassicalReductor', 'AcceptingPetriNetClassicalReductor_Release', 'AcceptingPetriNetDecomposer', 'AcceptingPetriNetDecomposer_Release', 'AcceptingPetriNetMiner', and 'AcceptingPetriNetMiner_Release'.


Hudson Utilities

[http://ais-hudson.win.tue.nl:8080/view/
System/job/Libs/lastBuild/console](http://ais-hudson.win.tue.nl:8080/view/System/job/Libs/lastBuild/console)

Shows list of libraries, and in which package
they are included

**Check this list before including another
copy of some library!**





Hudson

Hudson » System » Libs » #1068

[Back to Job Dashboard](#)
[Status](#)
[Changes](#)
[Build Now](#)
[Console Output](#)
[Configure Build](#)
[Configure Job](#)
[Downstream build view](#)
[Previous Build](#)

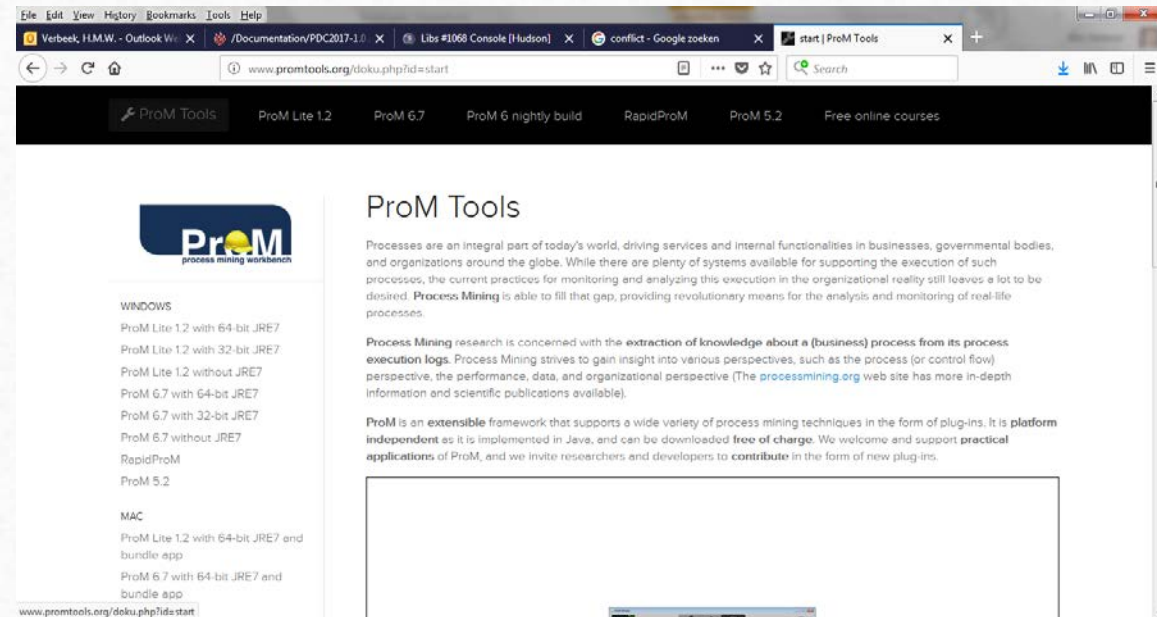
Console Output

```
Started by timer
[workspace] $ /bin/sh -xe /tmp/hudson1982819433309592860.sh
+ /home/hverbeek/hudson/scripts/sortLibs.sh
~/jobs ~/jobs/Libs/workspace
AccessCPN-unknown.jar CPNet
aida.jar InteractiveProcessMining
ant-1.9.4.jar ApacheUtils
ant-1.9.4.jar ContextAwarePerformance
ant-launcher-1.9.4.jar ContextAwarePerformance
antlr-2.7.7.jar Uma
antlr-runtime-3.2.jar ApacheUtils
antlr-runtime-3.2.jar ModelRepair
antlr-runtime-3.2.jar Uma
arpack_combined_all-0.1.jar ContextAwarePerformance
arpack_combined_all-0.1.jar Weka
asm-5.0.3.jar ApacheUtils
autocompletable-2.5.8.jar DataPetriNets
automaton-1.12-1.jar DeclareMinerFul
avalon-framework-api-4.3.1.jar GPLv2Utils
avalon-framework-impl-4.3.1.jar GPLv2Utils
axis-1.4.jar ProM-Plugins
axis.jar Framework
backport-util-concurrent-3.1.jar ContextAwarePerformance
batik-anim-1.9.1.jar GPLv2Utils
batik-awt-util-1.9.1.jar GPLv2Utils
batik-bridge-1.9.1.jar GPLv2Utils
batik-codec-1.9.1.jar GPLv2Utils
batik-constants-1.9.1.jar GPLv2Utils
batik-css-1.9.1.jar GPLv2Utils
batik-dom-1.9.1.jar GPLv2Utils
batik-ext-1.9.1.jar GPLv2Utils
```


Webserver

<http://www.promtools.org/doku.php>

- Latest regular releases
(Fixed, no changes)
- Latest Lite releases
(Framework fixed, packages may change)
- Nightly Builds
(...for the brave and the impatient)





Nightly Build

Packages are checked every hour for updates

User test of plug-in

If possible, install **all** packages

Do not rely on developer test of plug-in
only!

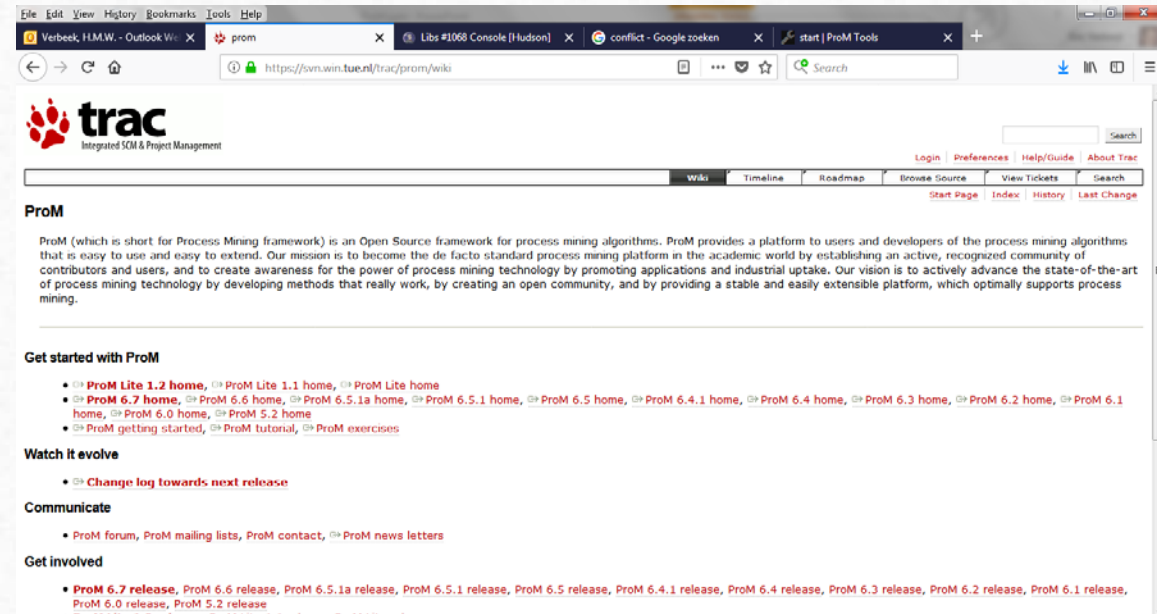


SVN Trac

<https://svn.win.tue.nl/trac/prom/wiki>

ProM development

- Source browser
- Documentation
- Bug reports
- Release candidates (ProM 6.8 alpha)



ProM 6.8 alpha

Welcome to the 16th International Conference on Business Process Management



Image Source: www.zicasso.com

SVN
Trac
Prom 6.8 alpha

[https://svn.win.tue.nl/trac/prom/wiki/
ProM68](https://svn.win.tue.nl/trac/prom/wiki/ProM68)

- Important Dates
- Downloads
- Change Logs
(Log, PNetReplayer, IM, ...)
- Release Notes
(Please add where you see fit)



ProM 6.8 release



Important dates

- March 12: Alpha release
- March 12 - May 14: Alpha testing
- May 14 - June 26: Alpha bug fixing
- June 25: Beta release
- June 25 - July 9: Beta testing and bug fixing
- July 9: Release



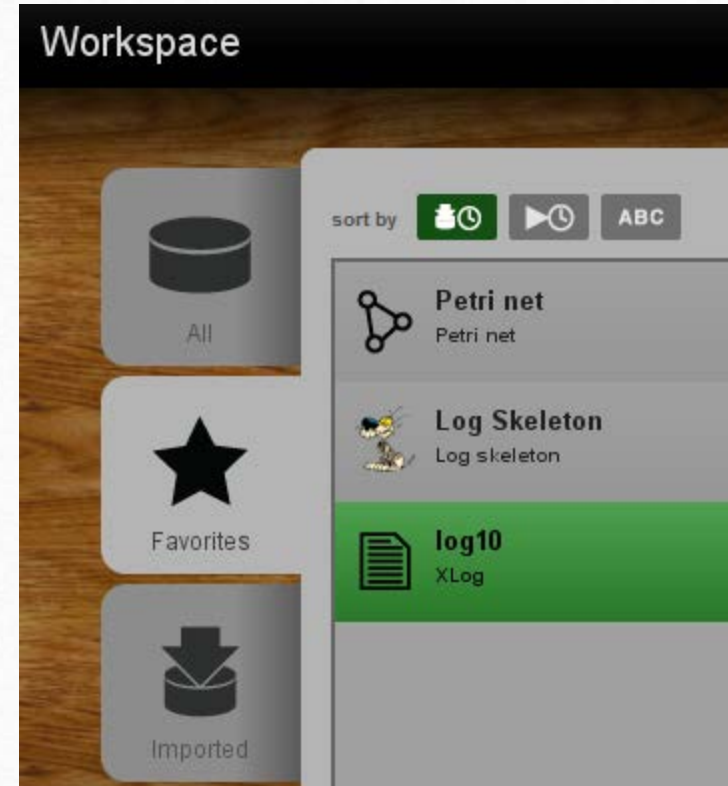
**KEEP
CALM
BECAUSE
EVERYTHING
CHANGES**



ProM icons

ProM icons I

How to do it?

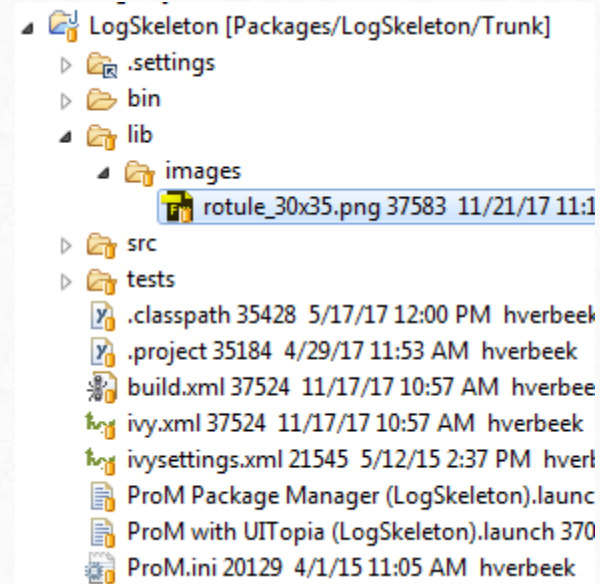


ProM icons II

Create your icon in the lib/images folder

Make it 30 pixels wide and 35 pixels high

Update (if necessary) the resolve target in your build.xml file, as the lib folder is not empty: **If needed set sync to false.**



ProM icons

III

Add the required annotations to your model class

```
*LogSkeleton... EditModelVi... EfficientTr...
1 package org.processmining.logskelton.models;
2
3+ import java.io.IOException;
28
29 @AuthorType(typeName = "Log skeleton",
30             affiliation = AuthorType.TUE,
31             author = "H.M.W. Verbeek",
32             email = "h.m.w.verbeek@tue.nl")
33 @Icon(icon = "rotule_30x35.png")
34 public class LogSkeleton implements HTMLToStrin
35
36 /*
37  * Holds the counters and the directly-foll
38  */
39 private LogSkeletonCount countModel;
40
41 /*
42  * The equivalence relation. If S is an ele
43  */
44 private Collection<Collection<String>> same
45
```

Questions?

