“Proficio”

Software Engineering C

Week 12 Group Report

**Project Leader:**

Adam Bramley

**Team Members:**

Stephen Allan

Leith Bade

Peter Williamson

Table of Contents

[1. Introduction 5](#_Toc272399144)

[1.1 Team Contribution 5](#_Toc272399145)

[1.1.1 Report Contribution 5](#_Toc272399146)

[1.2 End User Interactions 6](#_Toc272399147)

[1.3 Project Obstacles 6](#_Toc272399148)

[1.4 Project Plan 6](#_Toc272399149)

[2. Requirements Revision 7](#_Toc272399150)

[2.1 Functional Requirements: 7](#_Toc272399151)

[2.2 Non-Functional Requirements: 8](#_Toc272399152)

[2.3 Summary of changes 8](#_Toc272399153)

[3. Technological Assessment 8](#_Toc272399154)

[3.1 Language 8](#_Toc272399155)

[3.2 Integrated Development Environment (IDE) 9](#_Toc272399156)

[3.3 Architecture 10](#_Toc272399157)

[3.4 Plugin system 11](#_Toc272399158)

[3.5 Testing System 11](#_Toc272399159)

[3.6 Web Framework 12](#_Toc272399160)

[3.7 Web server 13](#_Toc272399161)

[3.8 Database 14](#_Toc272399162)

[3.9 Build System 16](#_Toc272399163)

[4. Project Life Cycle Methodologies 16](#_Toc272399164)

[4.1 Meetings 16](#_Toc272399165)

[4.2 Sprints 16](#_Toc272399166)

[4.3 Spike Tests 16](#_Toc272399167)

[4.4 Milestones 17](#_Toc272399168)

[5. System Architecture 17](#_Toc272399169)

[6. Deployment Strategy 18](#_Toc272399170)

[6.1 Deploying a JSP Application 18](#_Toc272399171)

[6.2 The Database 18](#_Toc272399172)

[7. Risk Management 19](#_Toc272399173)

[7.1 Risks that have been added since previous report 19](#_Toc272399174)

[8. Issue Tracking Policy 20](#_Toc272399175)

[8.1 Issue Tracking Workflow 20](#_Toc272399176)

[9. Testing and Metrics 20](#_Toc272399177)

[10. Appendices 22](#_Toc272399178)

[10.1 Appendix A – System Architecture 22](#_Toc272399179)

[10.2 Appendix B – Risk Analysis 23](#_Toc272399180)

[10.3 Appendix C – ER Diagram 27](#_Toc272399181)

[10.4 Appendix D – Use Case Diagram 28](#_Toc272399182)

[10.5 Appendix E – Gantt chart 29](#_Toc272399183)

[10.6 Appendix F – JDepend Report 30](#_Toc272399184)

[10.6.1 Summary 30](#_Toc272399185)

[10.6.2 Packages: 30](#_Toc272399186)

[10.6.3 Cycles 33](#_Toc272399187)

[10.7 Appendix G – Emma Report 34](#_Toc272399188)

[10.8 Appendix H – PMD Report 35](#_Toc272399190)

[10.9 Appendix I – Issue tracking 41](#_Toc272399191)

# 1. Introduction

*Please refer to Appendix E for a snapshot of the project plan.*

The goal of this project is to provide the administration staff at Massey University with a program to assist with the submission of academic publications to the Research Administration Management System (RIMS). The program is to capture relevant information on the academic paper from a generic input (document object identifier), and give the user an automatically generated form of information to submit to RIMS.

Our project team consists of 4 members each with different skill sets and experiences to contribute to an overall solid workforce. The following paragraphs outline brief auto-biographies from the team members with relevant information about their specific skills and talents.

## Team Contribution

At the beginning of the project our team discussed the various skill sets that each person had, from this we decided on the different threads that each member would mainly work on. As the team leader, Adam is in charge of delegating work, arranging meetings with the project manager, client, and team. Along with this, Adam has been focussing for the most part on designing the interface for the system and coding the jsp files up. This included writing any Javascript and CSS as well as the obvious HTML. Peter has been in charge of the database and all things related to the database. He has designed the DB from the start including the structure and all scripts required for creating, updating, and retrieving information in the DB. Steve has been working with all the APIs for the various meta-data gathering websites (CrossRef and Scopus so far) and extracting the information out of those, along with all searching functionality of the program. Finally, Leith has been in charge of structuring the project in regards to packages, classes, builds, interfaces, and plugins.

## 1.2 End User Interactions

During week 4-8 of our project, we have had several meetings with Karen Sutton, including one with Craig Manning. During these meetings our team has mainly discussed the project requirements with them. We do this by asking questions around what has already been implemented in the project and matching it to requirements gathered in week 2 of the project. Almost every time we have met with them there has been a change to the requirements, this is due to the massive difference in the expectations of the product between Craig and Karen. Craig seems to want the product to benefit him in some way, for example wanting us to export our database files to XML and CSV when there is really no reason for it. He also lead us quite astray with what was actually needed by the system, we made our database far too complex and included the unnecessary emailing due to his suggestions. The most beneficial interactions we have had is our meeting with Karen herself where we could specifically ask her questions about things like the process she goes through with RIMS at the moment, and how she would like the application to run through.

For usability testing we intend to set the application in front of another person that will be using the it in the future, and ask them to try to go through a series of steps to get a desired output. Preferably, this person will not be Karen as she has seen the program in use a few times already and will have the general idea of how it works. If we test it on some people that have never seen it before, we will get an idea of how usable the product is.

## 1.3 Project Obstacles

There are a few obstacles the project faces before completion in week 12. First off, our code has very weak test coverage (only 5% of all classes) this poses the huge threat of bugs to our system, although there have been no severe “bugs” found as of yet, the threat is still there. Furthermore, some of our packages are very instable meaning they aren’t at all resilient to change. There are also around 150 problems in the PMD report, but most of these are very minor and won’t take much to fix at all.

The other obstacles of the project relate to the goals we have made for week 12. We still have a few things to implement in our system, and getting them all done in 3 weeks might be a stretch. We still need to fully integrate the database into the system; this was put off as we drastically changed the structure of the database recently. The code for gathering data from Scopus has been written, but it is yet to be integrated into our plugin system. The final part of our system that needs to be coded is the printing of the document after submission.

## 1.4 Project Plan

*Please refer to Appendix E for a snapshot of the project plan and progress.*

As you can see from the snapshot, we are on schedule for most things. The first thing that is behind schedule is the remodelling of the architecture. This involves changing the singleton class of the Service having one per session to mitigate any concurrency issues we would get if the Service was singleton. The reason we are behind on this is that during the study break, there was almost no contact made by Leith including the week before the study break. This meant he did almost no work for 3 weeks and put that part of the project well behind. However, we are working hard to catch up this week and next and should still be on track to achieve our goals in week 12. Secondly, the database committing and retrieving is a bit behind. This is due to having to restructure our database after realising some information stored in there would be rather redundant. The scripts for inserting and retrieving from the database have been written, they just have not been tied into the system. Finally, the support for multiple authors is a bit behind. While multiple authors are gathered and displayed we intend to separate them in to different text boxes with their own affiliation box each. This is behind due to the increased workload this week on Adam with the report writing. But since he has finished the design of the interface, this will not hinder the completion of the project.

# 2. Requirements Revision

After speaking with Karen and Craig on the 21st July and multiple group meetings we came out with a refined list of functional and non-functional requirements. These requirements were further refined after receiving feedback from our project manager.

## 2.1 Functional Requirements:

1. The system needs to be able to take a DOI as an input, and output metadata for the article. This is to be done through a series of steps, going through the major databases including CrossRef and Scopus. The meta-data output includes: authors, article title, journal title, publication year, URL, page numbers, volume, and issue for journal articles. For conference articles we will also include conference location and start/end dates. For books we will also include the place published and editors of the book.
2. If the system cannot extract any meta-data, the raw article is to be produced.
3. The system has to display the meta-data on screen and allow the user to edit the data.
4. Access to a local database is needed. The author details and DOIs are stored in the database so author details can be automatically generated for known authors, and the system can check for duplicate DOIs.
5. The system needs to be able to print the cover sheet containing all the metadata.
6. If the user doesn’t have a DOI, the system needs an advanced search function with the ability to search the local database and online sources for matches when given the author name, article title, and publication date.

## 2.2 Non-Functional Requirements:

1. The system is to be run on windows
2. The system is to return local database results in under 3 seconds and web results in under 15 seconds per plugin.
3. The system needs to handle plug-in architecture
4. The system needs to have an automated deployment and maintenance procedure.
5. The system must have support for access to the internet and local database through a proxy.

These requirements have also been signed off by Karen on 5th August.

## 2.3 Summary of changes

These requirements have not changed much since the last report. The main changes have been that we are no longer attempting to “screen scrape” any information from publisher’s websites if our plugins fail. This is because it will be very rare that both Scopus and CrossRef return no data, and it isn’t very elegant relying on page layout and html tags to extract reliable information.

We have also decided not to change our plugin architecture to allow for article types that may need to be added in the future. We have decided this because Karen had told us at the very beginning of the project that the only things she deals with are Journal articles, Books, and Conferences. Since we structured our whole system around this there will need to be significant changes to switch to a plug-in type architecture for the types, and we simply don’t have the time to implement this.

# 5. System Architecture

*Please refer to Appendix A, Figure 1.*

Our system is quite different from the previous report so most of the following are changes.

From the figure, you can see that there are several main features that encompass our system architecture. Beginning at the left, the user (or the internet they are using) is directly interacting with the various servlets. There is one servlets per Java Service Page, which is for each different page that the user sees, that acts as the interface between the user and the service. The servlets’ input is http; this is the input that the system will receive from the forms that the user is filling out. The servlets’ output is html to display results of the system working on the input. The JSPs format the output of the servlets into html.

The first JSP the user interacts with in the application is the index page. This is where the user enters the DOI in. When the user submits the DOI it is sent to an object called the DOIRequest (or AdvancedRequest if the user is using the advanced search). The DOI request then creates an instance of the Service class. This Service class acts as a “service” to the servlets by interacting with the plugins and database. The Service then sends the DOI to the MetaDataRetreiverFactory. The class acts as a Factory for the different plugins, these plugins are the different websites we are using to gather the meta-data. Each plugin is tested to return a publication and when one is found the Service will receive it from the Factory. The plugins work by using the sites’ APIs and filling the Publication object with information gathered through XML.

Once the Service receives a Publication object, it adds it to the session and is then displayed on the results page. There are 3 separate results pages linked to each of the 3 publication types (book, conference, and journal). Once the user has finished editing the results and confirms the publication is then updated in the session and sent to the service. From there some details will be sent to the database, and a form will be printed if the user has chosen to.

The database is used to store dois as an extra safeguard against duplication. Along with this, author name, id, and affiliation will be stored in the database so that once the user has entered an affiliation for an author once, it will be automatically generated for them next time. There is a small possibility of the database returning the wrong affiliation, but our client has specified that as long as it is editable it will still be very helpful.

# 6. Deployment Strategy

The deployment strategy focuses on how to deploy a JSP application but some thought is also given to other deployment strategies should they become relevant (e.g. The same web application could possibly be built to incorporate a web service and client that connects to it which would have a different deployment set up).

## 6.1 Deploying a JSP Application

Any JSP application is going to need a web server to run on. In the Massey environment that could possibly even include a server set up on the client's individual machine, but will most likely require being set up on an existing Massey server. Internal Massey policy will most likely have some impact on the final location and the final installation procedure.

A permanent location on a Massey server allows for easier deployment for other users if the application becomes more popular. An individual machine set up would need to be replicated on each user's computer, taking considerable time and making maintenance very difficult.

Deploying the actual files and directories that make up the application would be a simple matter of deploying as a WAR file (Web Archive) to the server or copying the file set up directly via FTP or similar.

## 6.2 The Database

A locally accessed database is required for the author details and DOIs of articles that have already been entered. This is a change from our previous database as we are no longer storing all the publication data. We saw this as completely redundant; there is no need for the publication data to be stored apart from the DOI.

Storing the database on a server along with the application has several advantages; namely, that the database can be used by multiple users very easily and is easier to update, backup and maintain. A database on the user's computer lacks these advantages and also has the additional issue of replication of data if other users have their own databases set up. The local database needs to be able to avoid repetition of work which it would be unable to do if several copies of the same database existed.

Relocation of the database after installation can be managed by altering the web.xml file which contains the connection information.

# 8. Issue Tracking Policy

From weeks 8-12 our team took issue tracking much more seriously, mainly because there were potential marks involved in doing so. To our surprise, using them actually helped our project quite considerably, resulting in more bugs being fixed at a faster rate than before. We are now posting issues wherever we can’t find a solution immediately, or when the issue is with another member’s code.

8.1 Issue Tracking Workflow

* Open a new issue through the Google code project page
* Fill out the summary and description of the issue.
* Cc to all team members.
* Make sure the issue type and priority are set accordingly.
* Submit the issue.   
    
  *After the issue has been submitted:*
* Adam will assign the issue to the team member that was responsible for creating the issue. For example, since Peter is the main contributor to designing the database, any issues relating to the database will belong to him. This assures that issues will be fixed as fast as possible.  
    
  *After the issue has been resolved:*
* Adam will check the issue is solved, and if it is, set the issue to “Done” on the project page.

If an issue is open for more than 7 days, the team will have an extra meeting discussing the issue until it is resolved. In most cases, we will be able to resolve the issue with all team members discussing it. If the issue is still unable to be solved then further investigation will take place by a specific team member. If the particular issue is due to an extra feature, then that feature may be removed.

# 9. Testing and Metrics

*Please refer to Appendices F, G, and H for the reports.*

For testing our system and generating metrics we will utilise as many automated systems as possible. For testing we have decided to use Junit 3. This allows us to frequently run tests on our code to test for any new bugs that may have been introduced from freshly written code or refactoring. As part of our testing policy, each time a new issue is submitted a new test case will be added to account for the newly introduced bug. This will ensure the system is safe from the bug and allow us to change our code to suit it.

To automate metrics, we will be using EMMA, PMD, and JDepend to gather information on test coverage, code complexity, and dependencies. This will give us a good range of metrics to ensure our code is up to standard. To generate the reports we are using an ANT build script. This puts all the results in html files inside the resulting build file.

There is a major problem with the EMMA reports as they are giving very low results; it seems to be something to do with running the test cases through the build script on a server. The results are included but are not accurate.

We have also included a metric for the team’s participation. This is based on the percentage of commits to the repository each member has done. Keep in mind even though a percentage may be higher, different tasks require more or less work and in turn require more or less commits.

Total commits from 4/08/10 to 10/09/10:

Adam: 40% Leith: 26% Peter: 24% Steve: 10%

The data in this time period is in the time since the previous report was submitted.

## 9.1 Compatibility testing

All testing was done using Windows XP, this is because the only platform we expect the admin at Massey to be using is Windows and since it’s a web application the compatibility relies more on the browser.

|  |  |
| --- | --- |
| **Browser** | **Comments** |
| Mozilla 3.6.8 | Completely functional, all styles are showing along with AJAX animation. Meta-data gathering working as expected. |
| Internet Explorer 6 | Something is very wrong here. Even the button to send the DOI away isn’t showing. Curved borders also aren’t showing but that was expected. We are not worried about this as the users are very unlikely to be using IE6. |
| Google Chrome 6.0.4 | Completely functional, all styles are showing along with AJAX animation. Meta-data gathering working as expected. |
| Opera 10.62 | Completely functional, all styles are showing along with AJAX animation. Meta-data gathering working as expected. |

# 10. Appendices

## 10.1 Appendix A – System Architecture

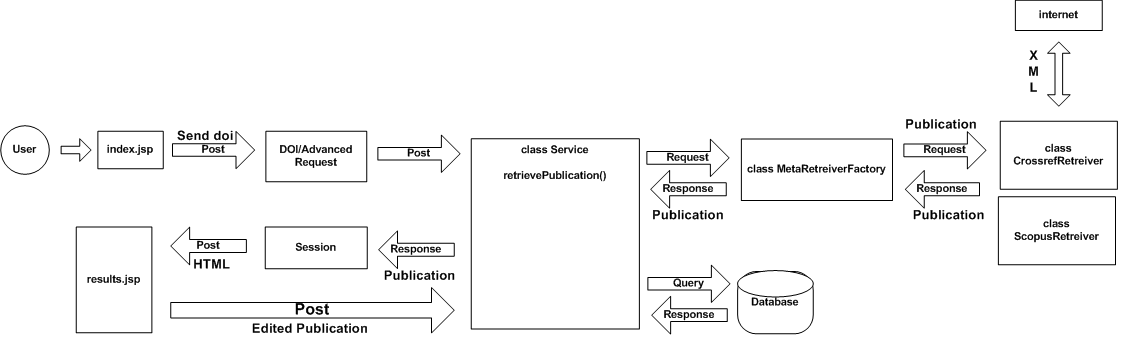


Figure 1. Improved System Architecture

## 10.3 Appendix C – Database Schema

string Massey\_ID**(PK)**  
string Massey\_First\_Name

string Massey\_Last\_Name  
string Massey\_Middle\_Name

string Type

string Department

string College

**Massey\_Author**

int Misc\_ID **(PK)**  
string Misc\_First\_Name

string Misc\_Last\_Name  
string Misc\_Middle\_Name

string Affiliation

**Misc\_Author**

string Publication\_DOI **(PK)**

**Publication**

## 10.4 Appendix D – Use Case Diagram

## 

User

Gather publication Information (No DOI)

<<includes>>

Fills out Coversheet

/Adds to Database

<<includes>>

<<includes>>

<includes>>

<<includes>>

Print

Coversheet

Add Staff   
Information

<<includes>>

Add RIMS   
Identifier

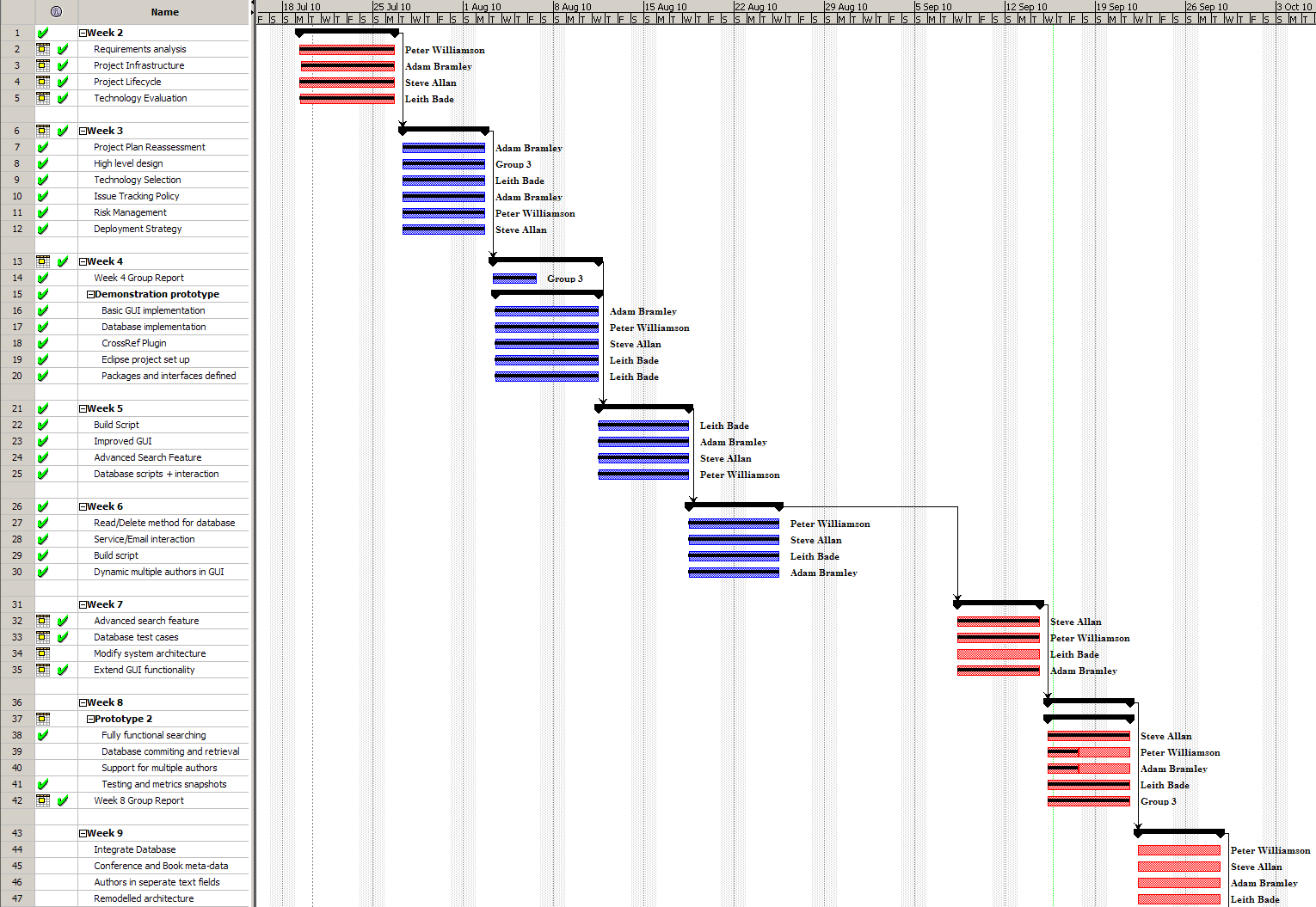
<<includes>>

<<includes>>

<<includes>>

Gather publication Information (DOI)

## 10.5 Appendix E – Gantt chart



## 10.6 Appendix F – JDepend Report

|  |  |
| --- | --- |
| This is a report generated using JDepend: 10.6.1 Summary | ] |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Package | Total Classes | [**Abstract Classes**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXnumber) | [**Concrete Classes**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXnumber) | [**Afferent Couplings**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent) | [**Efferent Couplings**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent) | [**Abstractness**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness) | [**Instability**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability) | [**Distance**](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance) |
| [nz.ac.massey.rimsgroup3](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3) | 1 | 0 | 1 | 1 | 2 | 0 | 0.67 | 0.33 |
| [nz.ac.massey.rimsgroup3.DB.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.DB.test) | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| [nz.ac.massey.rimsgroup3.database](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.database) | 7 | 0 | 7 | 1 | 1 | 0 | 0.5 | 0.5 |
| [nz.ac.massey.rimsgroup3.metadata](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata) | 3 | 1 | 2 | 3 | 1 | 0.33 | 0.25 | 0.42 |
| [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) | 8 | 0 | 8 | 8 | 0 | 0 | 0 | 1 |
| [nz.ac.massey.rimsgroup3.metadata.plugin](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin) | 2 | 0 | 2 | 1 | 2 | 0 | 0.67 | 0.33 |
| [nz.ac.massey.rimsgroup3.metadata.plugin.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin.test) | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| [nz.ac.massey.rimsgroup3.metadata.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.test) | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| [nz.ac.massey.rimsgroup3.servlet](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.servlet) | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 0 |

### 

### 10.6.2 Packages:

#### nz.ac.massey.rimsgroup3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 1 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 2 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 0.67 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0.33 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.Service | [nz.ac.massey.rimsgroup3.servlet](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.servlet) | [nz.ac.massey.rimsgroup3.metadata](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata)  [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) |

#### nz.ac.massey.rimsgroup3.DB.test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 0 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 2 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 1 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.DB.test.TestingDatabase | *None* | [nz.ac.massey.rimsgroup3.database](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.database)  [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) |

#### nz.ac.massey.rimsgroup3.database

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 1 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 1 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 0.5 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0.5 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.database.DatabaseConnection  nz.ac.massey.rimsgroup3.database.DatabaseInsert  nz.ac.massey.rimsgroup3.database.DatabaseModify  nz.ac.massey.rimsgroup3.database.DatabaseRead  nz.ac.massey.rimsgroup3.database.InsertStatements  nz.ac.massey.rimsgroup3.database.ModifyStatements  nz.ac.massey.rimsgroup3.database.ReadStatements | [nz.ac.massey.rimsgroup3.DB.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.DB.test) | [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) | |

#### nz.ac.massey.rimsgroup3.metadata

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 3 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 1 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0.33 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 0.25 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0.42 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| nz.ac.massey.rimsgroup3.metadata.MetadataRetriever | nz.ac.massey.rimsgroup3.metadata.DOINotFoundException  nz.ac.massey.rimsgroup3.metadata.MetadataRetrieverFactory | [nz.ac.massey.rimsgroup3](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3)  [nz.ac.massey.rimsgroup3.metadata.plugin](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin)  [nz.ac.massey.rimsgroup3.metadata.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.test) | [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) |

### 

#### nz.ac.massey.rimsgroup3.metadata.bean

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 8 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 0 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 0 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.metadata.bean.Author  nz.ac.massey.rimsgroup3.metadata.bean.Book  nz.ac.massey.rimsgroup3.metadata.bean.Conference  nz.ac.massey.rimsgroup3.metadata.bean.Editor  nz.ac.massey.rimsgroup3.metadata.bean.Information  nz.ac.massey.rimsgroup3.metadata.bean.Journal  nz.ac.massey.rimsgroup3.metadata.bean.Person  nz.ac.massey.rimsgroup3.metadata.bean.Publication | [nz.ac.massey.rimsgroup3](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3)  [nz.ac.massey.rimsgroup3.DB.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.DB.test)  [nz.ac.massey.rimsgroup3.database](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.database)  [nz.ac.massey.rimsgroup3.metadata](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata)  [nz.ac.massey.rimsgroup3.metadata.plugin](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin)  [nz.ac.massey.rimsgroup3.metadata.plugin.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin.test)  [nz.ac.massey.rimsgroup3.metadata.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.test)  [nz.ac.massey.rimsgroup3.servlet](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.servlet) | *None* |

#### nz.ac.massey.rimsgroup3.metadata.plugin

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 1 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 2 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 0.67 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0.33 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.metadata.plugin.CrossrefRetriever  nz.ac.massey.rimsgroup3.metadata.plugin.ScopusRetriever | [nz.ac.massey.rimsgroup3.metadata.plugin.test](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin.test) | [nz.ac.massey.rimsgroup3.metadata](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata)  [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) |

### 

#### nz.ac.massey.rimsgroup3.metadata.plugin.test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 0 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 2 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 1 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.metadata.plugin.test.CrossrefRetrieverTest | *None* | [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean)  [nz.ac.massey.rimsgroup3.metadata.plugin](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.plugin) |

#### nz.ac.massey.rimsgroup3.metadata.test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 0 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 2 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 1 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.metadata.test.MetadataRetrieverFactoryTest | *None* | [nz.ac.massey.rimsgroup3.metadata](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata)  [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) |

#### nz.ac.massey.rimsgroup3.servlet

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [Afferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXafferent): 0 | [Efferent Couplings](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXefferent): 2 | [Abstractness](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXabstractness): 0 | [Instability](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXinstability): 1 | [Distance](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#EXdistance): 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| Abstract Classes | Concrete Classes | Used by Packages | Uses Packages |
| *None* | nz.ac.massey.rimsgroup3.servlet.AdvancedRequest  nz.ac.massey.rimsgroup3.servlet.DoiRequest | *None* | [nz.ac.massey.rimsgroup3](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3)  [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build\qa-reports\jdepend-report.html#PKnz.ac.massey.rimsgroup3.metadata.bean) |

|  |  |
| --- | --- |
| 10.6.3 Cycles | ] |

There are no cyclic dependancies.

## 10.7 Appendix G – Emma Report

## OVERALL COVERAGE SUMMARY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| name | class, % | method, % | block, % | line, % |
| all classes | 5%   (1/22) | 2%   (3/162) | 1%   (24/2620) | 1%   (7.4/749) |

OVERALL STATS SUMMARY

|  |  |
| --- | --- |
| total packages: | 6 |
| total executable files: | 22 |
| total classes: | 22 |
| total methods: | 162 |
| total executable lines: | 749 |

COVERAGE BREAKDOWN BY PACKAGE

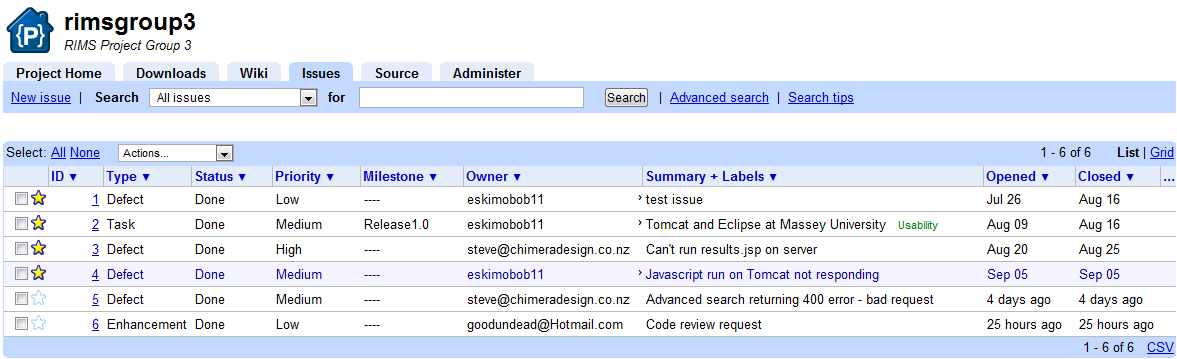
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| name | class, % | method, % | block, % | line, % |
| [nz.ac.massey.rimsgroup3](file:///C:\Users\Adam\Downloads\build%20(1)\build\qa-reports\emma\_files\0.html) | 0%  (0/1) | 0%  (0/3) | 0%  (0/19) | 0%  (0/7) |
| [nz.ac.massey.rimsgroup3.database](file:///C:\Users\Adam\Downloads\build%20(1)\build\qa-reports\emma\_files\1.html) | 0%  (0/7) | 0%  (0/37) | 0%  (0/1557) | 0%  (0/419) |
| [nz.ac.massey.rimsgroup3.metadata.bean](file:///C:\Users\Adam\Downloads\build%20(1)\build\qa-reports\emma\_files\2.html) | 0%  (0/8) | 0%  (0/89) | 0%  (0/351) | 0%  (0/132) |
| [nz.ac.massey.rimsgroup3.metadata.plugin](file:///C:\Users\Adam\Downloads\build%20(1)\build\qa-reports\emma\_files\3.html) | 0%  (0/2) | 0%  (0/16) | 0%  (0/331) | 0%  (0/98) |
| [nz.ac.massey.rimsgroup3.servlet](file:///C:\Users\Adam\Downloads\build%20(1)\build\qa-reports\emma\_files\4.html) | 0%  (0/2) | 0%  (0/12) | 0%  (0/307) | 0%  (0/77) |
| [nz.ac.massey.rimsgroup3.metadata](file:///C:\Users\Adam\Downloads\build%20(1)\build\qa-reports\emma\_files\5.html) | 50%  (1/2) | 60%  (3/5) | 44% (24/55) | 46% (7.4/16) |

## 10.8 Appendix H – PMD Report

The following is a report generated by PMD

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **File** | **Line** | **Problem** |
| 1 | nz\ac\massey\rimsgroup3\Service.java | 13 | [A class which only has private constructors should be final](http://pmd.sourceforge.net/rules/design.html#ClassWithOnlyPrivateConstructorsShouldBeFinal) |
| 2 | nz\ac\massey\rimsgroup3\Service.java | 16 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 3 | nz\ac\massey\rimsgroup3\Service.java | 16 | [Private field 'retriever' could be made final; it is only initialized in the declaration or constructor.](http://pmd.sourceforge.net/rules/design.html#ImmutableField) |
| 4 | nz\ac\massey\rimsgroup3\Service.java | 22 | [Use block level rather than method level synchronization](http://pmd.sourceforge.net/rules/design.html#AvoidSynchronizedAtMethodLevel) |
| 5 | nz\ac\massey\rimsgroup3\Service.java | 23 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 6 | nz\ac\massey\rimsgroup3\database\DatabaseConnection.java | 11 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 7 | nz\ac\massey\rimsgroup3\database\DatabaseConnection.java | 13 | [Avoid variables with short names like db](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 8 | nz\ac\massey\rimsgroup3\database\DatabaseConnection.java | 19 | [Avoid using if...else statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfElseStmtsMustUseBraces) |
| 9 | nz\ac\massey\rimsgroup3\database\DatabaseConnection.java | 21 | [Avoid using if...else statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfElseStmtsMustUseBraces) |
| 10 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 17 | [Avoid unused imports such as 'org.apache.catalina.Session'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 11 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 17 | [Avoid unused imports such as 'org.apache.catalina.Session'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 12 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 18 | [Avoid unused imports such as 'org.apache.tomcat.dbcp.dbcp.DataSourceConnectionFactory'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 13 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 18 | [Avoid unused imports such as 'org.apache.tomcat.dbcp.dbcp.DataSourceConnectionFactory'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 14 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 22 | [The class 'DatabaseInsert' has a Cyclomatic Complexity of 6 (Highest = 19).](http://pmd.sourceforge.net/rules/codesize.html#CyclomaticComplexity) |
| 15 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 24 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 16 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 46 | [Avoid variables with short names like db](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 17 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 56 | [Avoid really long methods.](http://pmd.sourceforge.net/rules/codesize.html#ExcessiveMethodLength) |
| 18 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 56 | [The method 'doGet' has a Cyclomatic Complexity of 19.](http://pmd.sourceforge.net/rules/codesize.html#CyclomaticComplexity) |
| 19 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 56 | [The method doGet() has an NPath complexity of 5072](http://pmd.sourceforge.net/rules/codesize.html#NPathComplexity) |
| 20 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 71 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 21 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 72 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 22 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 73 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 23 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 83 | [Avoid excessively long variable names like statementPublication](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 24 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 85 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 25 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 87 | [Avoid variables with short names like i](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 26 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 91 | [Avoid excessively long variable names like statementPublished](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 27 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 95 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 28 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 96 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 29 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 103 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 30 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 108 | [Avoid excessively long variable names like statementConference](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 31 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 110 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 32 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 117 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 33 | nz\ac\massey\rimsgroup3\database\DatabaseInsert.java | 124 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 34 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 4 | [Avoid unused imports such as 'java.sql.Connection'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 35 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 4 | [Avoid unused imports such as 'java.sql.Connection'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 36 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 5 | [Avoid unused imports such as 'java.sql.SQLException'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 37 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 5 | [Avoid unused imports such as 'java.sql.SQLException'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 38 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 6 | [Avoid unused imports such as 'java.util.ArrayList'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 39 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 6 | [Avoid unused imports such as 'java.util.ArrayList'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 40 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 22 | [Avoid unused private fields such as 'datasource'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedPrivateField) |
| 41 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 50 | [Avoid excessively long variable names like modifyToThisInformation](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 42 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 51 | [Avoid excessively long variable names like originalInformation](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 43 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 54 | [Avoid unused local variables such as 'origAuthor'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedLocalVariable) |
| 44 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 57 | [Avoid unused local variables such as 'newAuthor'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedLocalVariable) |
| 45 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 61 | [Avoid if (x != y) ..; else ..;](http://pmd.sourceforge.net/rules/design.html#ConfusingTernary) |
| 46 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 62 | [Avoid empty if statements](http://pmd.sourceforge.net/rules/basic.html#EmptyIfStmt) |
| 47 | nz\ac\massey\rimsgroup3\database\DatabaseModify.java | 66 | [Avoid empty if statements](http://pmd.sourceforge.net/rules/basic.html#EmptyIfStmt) |
| 48 | nz\ac\massey\rimsgroup3\database\DatabaseRead.java | 25 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 49 | nz\ac\massey\rimsgroup3\database\DatabaseRead.java | 46 | [Avoid variables with short names like db](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 50 | nz\ac\massey\rimsgroup3\database\DatabaseRead.java | 78 | [Position literals first in String comparisons](http://pmd.sourceforge.net/rules/design.html#PositionLiteralsFirstInComparisons) |
| 51 | nz\ac\massey\rimsgroup3\database\DatabaseRead.java | 84 | [Position literals first in String comparisons](http://pmd.sourceforge.net/rules/design.html#PositionLiteralsFirstInComparisons) |
| 52 | nz\ac\massey\rimsgroup3\database\DatabaseRead.java | 90 | [Position literals first in String comparisons](http://pmd.sourceforge.net/rules/design.html#PositionLiteralsFirstInComparisons) |
| 53 | nz\ac\massey\rimsgroup3\database\InsertStatements.java | 13 | [All methods are static. Consider using Singleton instead. Alternatively, you could add a private constructor or make the class abstract to silence this warning.](http://pmd.sourceforge.net/rules/design.html#UseSingleton) |
| 54 | nz\ac\massey\rimsgroup3\database\InsertStatements.java | 60 | [Avoid excessively long variable names like statementConference](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 55 | nz\ac\massey\rimsgroup3\database\InsertStatements.java | 122 | [Avoid excessively long variable names like statementPublication](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 56 | nz\ac\massey\rimsgroup3\database\InsertStatements.java | 136 | [Avoid variables with short names like i](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 57 | nz\ac\massey\rimsgroup3\database\InsertStatements.java | 158 | [Avoid excessively long variable names like statementPublished](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 58 | nz\ac\massey\rimsgroup3\database\ModifyStatements.java | 10 | [All methods are static. Consider using Singleton instead. Alternatively, you could add a private constructor or make the class abstract to silence this warning.](http://pmd.sourceforge.net/rules/design.html#UseSingleton) |
| 59 | nz\ac\massey\rimsgroup3\database\ModifyStatements.java | 34 | [Avoid variables with short names like i](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 60 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 11 | [All methods are static. Consider using Singleton instead. Alternatively, you could add a private constructor or make the class abstract to silence this warning.](http://pmd.sourceforge.net/rules/design.html#UseSingleton) |
| 61 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 22 | [Ensure that resources like this ResultSet object are closed after use](http://pmd.sourceforge.net/rules/design.html#CloseResource) |
| 62 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 37 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 63 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 53 | [Ensure that resources like this ResultSet object are closed after use](http://pmd.sourceforge.net/rules/design.html#CloseResource) |
| 64 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 62 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 65 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 75 | [Avoid excessively long variable names like statementConference](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 66 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 79 | [Ensure that resources like this ResultSet object are closed after use](http://pmd.sourceforge.net/rules/design.html#CloseResource) |
| 67 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 90 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 68 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 107 | [Ensure that resources like this ResultSet object are closed after use](http://pmd.sourceforge.net/rules/design.html#CloseResource) |
| 69 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 118 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 70 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 136 | [Ensure that resources like this ResultSet object are closed after use](http://pmd.sourceforge.net/rules/design.html#CloseResource) |
| 71 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 146 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 72 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 159 | [Avoid excessively long variable names like statementPublication](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 73 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 161 | [Ensure that resources like this ResultSet object are closed after use](http://pmd.sourceforge.net/rules/design.html#CloseResource) |
| 74 | nz\ac\massey\rimsgroup3\database\ReadStatements.java | 186 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 75 | nz\ac\massey\rimsgroup3\metadata\DOINotFoundException.java | 14 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 76 | nz\ac\massey\rimsgroup3\metadata\DOINotFoundException.java | 14 | [Private field 'doi' could be made final; it is only initialized in the declaration or constructor.](http://pmd.sourceforge.net/rules/design.html#ImmutableField) |
| 77 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 17 | [A class which only has private constructors should be final](http://pmd.sourceforge.net/rules/design.html#ClassWithOnlyPrivateConstructorsShouldBeFinal) |
| 78 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 20 | [Avoid excessively long variable names like metadataRetrievers](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 79 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 20 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 80 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 20 | [Private field 'metadataRetrievers' could be made final; it is only initialized in the declaration or constructor.](http://pmd.sourceforge.net/rules/design.html#ImmutableField) |
| 81 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 29 | [Use block level rather than method level synchronization](http://pmd.sourceforge.net/rules/design.html#AvoidSynchronizedAtMethodLevel) |
| 82 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 30 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 83 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 36 | [Use block level rather than method level synchronization](http://pmd.sourceforge.net/rules/design.html#AvoidSynchronizedAtMethodLevel) |
| 84 | nz\ac\massey\rimsgroup3\metadata\MetadataRetrieverFactory.java | 45 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 85 | nz\ac\massey\rimsgroup3\metadata\bean\Conference.java | 6 | [Avoid unused imports such as 'java.util.Date'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 86 | nz\ac\massey\rimsgroup3\metadata\bean\Conference.java | 6 | [Avoid unused imports such as 'java.util.Date'](http://pmd.sourceforge.net/rules/imports.html#UnusedImports) |
| 87 | nz\ac\massey\rimsgroup3\metadata\bean\Person.java | 12 | [Avoid variables with short names like id](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 88 | nz\ac\massey\rimsgroup3\metadata\bean\Person.java | 12 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 89 | nz\ac\massey\rimsgroup3\metadata\bean\Person.java | 21 | [Avoid variables with short names like id](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 90 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 14 | [Avoid variables with short names like id](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 91 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 14 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 92 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 22 | [Found non-transient, non-static member. Please mark as transient or provide accessors.](http://pmd.sourceforge.net/rules/javabeans.html#BeanMembersShouldSerialize) |
| 93 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 22 | [It is somewhat confusing to have a field name with the same name as a method](http://pmd.sourceforge.net/rules/naming.html#AvoidFieldNameMatchingMethodName) |
| 94 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 25 | [Avoid excessively long variable names like publicationCategory](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 95 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 37 | [Avoid variables with short names like id](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 96 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 51 | [Avoid excessively long variable names like publicationCategory](http://pmd.sourceforge.net/rules/naming.html#LongVariable) |
| 97 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 79 | [Avoid variables with short names like id](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 98 | nz\ac\massey\rimsgroup3\metadata\bean\Publication.java | 214 | [Avoid if (x != y) ..; else ..;](http://pmd.sourceforge.net/rules/design.html#ConfusingTernary) |
| 99 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 35 | [The field name indicates a constant but its modifiers do not](http://pmd.sourceforge.net/rules/naming.html#SuspiciousConstantFieldName) |
| 100 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 35 | [Variables should start with a lowercase character](http://pmd.sourceforge.net/rules/naming.html#VariableNamingConventions) |
| 101 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 35 | [Variables that are not final should not contain underscores (except for underscores in standard prefix/suffix).](http://pmd.sourceforge.net/rules/naming.html#VariableNamingConventions) |
| 102 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 63 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 103 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 102 | [Avoid using implementation types like 'ArrayList'; use the interface instead](http://pmd.sourceforge.net/rules/coupling.html#LooseCoupling) |
| 104 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 106 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 105 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 112 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 106 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 121 | [Avoid if (x != y) ..; else ..;](http://pmd.sourceforge.net/rules/design.html#ConfusingTernary) |
| 107 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 153 | [Avoid unused method parameters such as 'xmlDoc'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedFormalParameter) |
| 108 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 153 | [Avoid unused private methods such as 'parseBook(Document)'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedPrivateMethod) |
| 109 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 159 | [Avoid unused private methods such as 'parseConference()'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedPrivateMethod) |
| 110 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 172 | [Avoid unused private methods such as 'safeParseInt(String)'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedPrivateMethod) |
| 111 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 191 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 112 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 196 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 113 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 213 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 114 | nz\ac\massey\rimsgroup3\metadata\plugin\CrossrefRetriever.java | 218 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 115 | nz\ac\massey\rimsgroup3\metadata\plugin\ScopusRetriever.java | 30 | [Avoid using if statements without curly braces](http://pmd.sourceforge.net/rules/braces.html#IfStmtsMustUseBraces) |
| 116 | nz\ac\massey\rimsgroup3\metadata\plugin\ScopusRetriever.java | 30 | [Position literals first in String comparisons](http://pmd.sourceforge.net/rules/design.html#PositionLiteralsFirstInComparisons) |
| 117 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 3 | [Avoid duplicate imports such as 'java.io.IOException'](http://pmd.sourceforge.net/rules/imports.html#DuplicateImports) |
| 118 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 3 | [Avoid duplicate imports such as 'java.io.IOException'](http://pmd.sourceforge.net/rules/imports.html#DuplicateImports) |
| 119 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 4 | [Avoid duplicate imports such as 'java.io.InputStream'](http://pmd.sourceforge.net/rules/imports.html#DuplicateImports) |
| 120 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 4 | [Avoid duplicate imports such as 'java.io.InputStream'](http://pmd.sourceforge.net/rules/imports.html#DuplicateImports) |
| 121 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 28 | [Document empty constructor](http://pmd.sourceforge.net/rules/design.html#UncommentedEmptyConstructor) |
| 122 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 66 | [Avoid unused local variables such as 'test1'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedLocalVariable) |
| 123 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 67 | [Avoid unused local variables such as 'test2'.](http://pmd.sourceforge.net/rules/unusedcode.html#UnusedLocalVariable) |
| 124 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 84 | [Method names should not start with capital letters](http://pmd.sourceforge.net/rules/naming.html#MethodNamingConventions) |
| 125 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 91 | [Avoid if (x != y) ..; else ..;](http://pmd.sourceforge.net/rules/design.html#ConfusingTernary) |
| 126 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 96 | [Avoid empty catch blocks](http://pmd.sourceforge.net/rules/basic.html#EmptyCatchBlock) |
| 127 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 125 | [Avoid variables with short names like is](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 128 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 131 | [Avoid if (x != y) ..; else ..;](http://pmd.sourceforge.net/rules/design.html#ConfusingTernary) |
| 129 | nz\ac\massey\rimsgroup3\servlet\AdvancedRequest.java | 132 | [Avoid variables with short names like sb](http://pmd.sourceforge.net/rules/naming.html#ShortVariable) |
| 130 | nz\ac\massey\rimsgroup3\servlet\DoiRequest.java | 38 | [Avoid if (x != y) ..; else ..;](http://pmd.sourceforge.net/rules/design.html#ConfusingTernary) |

## 10.9 Appendix I – Issue tracking



Number of open issues: 0  
Number of closed issues: 5 (not including test issue)  
Average time to close issues: 3-4 days