|  |  |
| --- | --- |
|  | *Code Inspection Report*  *Anti-Spam Configuration Software Development Project*  LIGE  Academic Year 2017/2018 - 1º Semester  Software Engineering I  Group 70  72953, Débora Gabriel, IC2  73291, Filipe Teixeira, IC1  72788, Mafalda Cardoso, IC1  73680, Rui Francisco, IC2  ISCTE-IUL, Instituto Universitário de Lisboa  1649-026 Lisbon  Portugal  November 25th 2017 |

**Table of Contents**

[Introduction 3](#_Toc501724037)

[Code inspection – Avaliators & InputOutput 3](#_Toc501724039)

[Code inspection checklist 4](#_Toc501724040)

[Conclusions of the inspection process 7](#_Toc501724041)

# Introduction

# O *software* desenvolvido no âmbito do projeto da UC calcula o vetor de pesos ótimo para o filtro anti-spam, ou seja, calcula o peso ótimo a atribuir a cada regra presente no ficheiro de configuração do filtro anti-spam – ficheiro *rules.cf*. A configuração ótima tem em consideração se o filtro anti-spam é destinado a caixas de *e-mail* para uso profissional.

# Code inspection – *Avaliators & InputOutput*

1. ***Avaliators/FalseNegativeAvaliator****-* Cria um avaliador que abrirá o arquivo de Spam designado. Calcula como o conjunto atual de pesos avaliará os e-mails do *Spam* corretamente como *Spam*.
2. ***Avaliators/FalsePositiveAvaliator****-* Cria um avaliador que abrirá o *Ham File* designado. Calcula como o conjunto atual de pesos avaliará corretamente os *e-mails* do *Ham* como *Ham*.
3. ***InputOutput/HamReader****-* Esta classe mapeia todos os e-mails de *Ham* em uma relação (número de *e-mail*) - (regras observadas).
4. ***InputOutput/RulesReader****-* Esta classe mapeia todas as Regras em uma relação de peso-regras e representa-a visualmente.
5. ***InputOutput/SolutionReader****-* Esta classe lê de um *algorithm-created-file e* calcula o melhor par de *False Positives* e *False Negatives* de acordo com a especificação de um *AntiSpamFilter* para uma *ProfessionalMailBox*. Depois de fazê-lo, lê o conjunto de regras que é a gênese dessa solução otimizada e transfere-a para a GUI para visualização
6. ***InputOutput/SpamReader****-* Esta classe mapeia todos os e-mails de *Spam* em uma relação (número de *e-mail*) - (regras observadas).
7. ***InputOutput/Writer****-* Esta classe escreve o conjunto desejado de regras e seus pesos para o arquivo que eles foram lidos.

|  |  |
| --- | --- |
| *Meeting date:*  *Meeting duration:*  *Moderator:*  *Producer:*  *Inspector:*  *Recorder:* | *21/12/2017*  *20 minutes*  *Mafalda Cardoso*  *Filipe Teixeira, Rui Francisco*  *Débora Gabriel* |
| *Component name (Package/Class/Method):* | *Avaliators/FalseNegativeAvaliator*  *Avaliators/FalsePositiveAvaliator*  *InputOutput/HamReader*  *InputOutput/RulesReader*  *InputOutput/SolutionReader*  *InputOutput/SpamReader*  *InputOutput/Writer* |
| *Component was compiled:* | *Sim.* |
| *Component was executed:* | *Sim.* |
| *Component was tested without errors:* | *Sim.* |
| *Testing coverage achieved:* | *Sim.* |

# 

# Code inspection checklist

*Java Inspection Checklist*

*Copyright © 1999 by Christopher Fox. Used with permission.*

**1. Variable, Attribute, and Constant Declaration Defects (VC)**

□ Are descriptive variable and constant names used in accord with naming conventions?

□ Are there variables or attributes with confusingly similar names?

□ Is every variable and attribute correctly typed?

□ Is every variable and attribute properly initialized?

□ Could any non-local variables be made local?

□ Are all for-loop control variables declared in the loop header?

□ Are there literal constants that should be named constants?

□ Are there variables or attributes that should be constants?

□ Are there attributes that should be local variables?

□ Do all attributes have appropriate access modifiers (private, protected, public)?

□ Are there static attributes that should be non-static or vice-versa?

**2. Method Definition Defects (FD)**

□ Are descriptive method names used in accord with naming conventions?

□ Is every method parameter value checked before being used?

□ For every method: Does it return the correct value at every method return point?

□ Do all methods have appropriate access modifiers (private, protected, public)?

□ Are there static methods that should be non-static or vice-versa?

**3. Class Definition Defects (CD)**

□ Does each class have appropriate constructors and destructors?

□ Do any subclasses have common members that should be in the superclass?

□ Can the class inheritance hierarchy be simplified?

**4. Data Reference Defects (DR)**

□ For every array reference: Is each subscript value within the defined bounds ?

□ For every object or array reference: Is the value certain to be non-null?

**5. Computation/Numeric Defects (CN)**

□ Are there any computations with mixed data types?

□ Is overflow or underflow possible during a computation?

□ For each expressions with more than one operator: Are the assumptions about order of evaluation and precedence correct?

□ Are parentheses used to avoid ambiguity?

**6. Comparison/Relational Defects (CR)**

□ For every boolean test: Is the correct condition checked?

□ Are the comparison operators correct?

□ Has each boolean expression been simplified by driving negations inward?

□ Is each boolean expression correct?

□ Are there improper and unnoticed side-effects of a comparison?

□ Has an "&" inadvertently been interchanged with a "&&" or a "|" for a "||"?

**7. Control Flow Defects (CF)**

□ For each loop: Is the best choice of looping constructs used?

□ Will all loops terminate?

□ When there are multiple exits from a loop, is each exit necessary and handled properly?

□ Does each switch statement have a default case?

□ Are missing switch case break statements correct and marked with a comment?

□ Do named break statements send control to the right place?

□ Is the nesting of loops and branches too deep, and is it correct?

□ Can any nested if statements be converted into a switch statement?

□ Are null bodied control structures correct and marked with braces or comments?

□ Are all exceptions handled appropriately?

□ Does every method terminate?

**8. Input-Output Defects (IO)**

□ Have all files been opened before use?

□ Are the attributes of the input object consistent with the use of the file?

□ Have all files been closed after use?

□ Are there spelling or grammatical errors in any text printed or displayed?

□ Are all I/O exceptions handled in a reasonable way?

**9. Module Interface Defects (MI)**

□ Are the number, order, types, and values of parameters in every method call in agreement with the called method's declaration?

□ Do the values in units agree (e.g., inches versus yards)?

□ If an object or array is passed, does it get changed, and changed correctly by the called method?

**10. Comment Defects (CM)**

□ Does every method, class, and file have an appropriate header comment?

□ Does every attribute, variable, and constant declaration have a comment?

□ Is the underlying behavior of each method and class expressed in plain language?

□ Is the header comment for each method and class consistent with the behavior of the method or class?

□ Do the comments and code agree?

□ Do the comments help in understanding the code?

□ Are there enough comments in the code?

□ Are there too many comments in the code?

**11. Layout and Packaging Defects (LP)**

□ Is a standard indentation and layout format used consistently?

□ For each method: Is it no more than about 60 lines long?

□ For each compile module: Is no more than about 600 lines long?

**12. Modularity Defects (MO)**

□ Is there a low level of coupling between modules (methods and classes)?

□ Is there a high level of cohesion within each module (methods or class)?

□ Is there repetitive code that could be replaced by a call to a method that provides the behavior of the repetitive code?

□ Are the Java class libraries used where and when appropriate?

**13. Storage Usage Defects (SU)**

□ Are arrays large enough?

□ Are object and array references set to null once the object or array is no longer needed?

**14. Performance Defects (PE)**

□ Can better data structures or more efficient algorithms be used?

□ Are logical tests arranged such that the often successful and inexpensive tests precede the more expensive and less frequently successful tests ?

□ Can the cost of recomputing a value be reduced by computing it once and storing the results?

□ Is every result that is computed and stored actually used?

□ Can a computation be moved outside a loop?

□ Are there tests within a loop that do not need to be done?

□ Can a short loop be unrolled?

□ Are there two loops operating on the same data that can be combined into one?

□ Are frequently used variables declared register?

□ Are short and commonly called methods declared inline?

# Conclusions of the inspection process

Foram obtidas melhorias liquídas substanciais na qualidade e produtividade da programação, através do uso da última inspeção formal de código. As melhorias são possíveis graças a um processo sistemático e eficiente de verificação de projeto e código.

A maneira como os dados de inspeção são categorizados e adequados para a análise de processos é um fator importante na obtenção das melhorias. Mostra-se que, ao usar os resultados da inspeção, pode-se conseguir um mecanismo para redução de erro inicial seguido de taxas de erro cada vez menores.

Nesta última inspeção não foram encontrados nenhum tipo de *defects*, dado o facto que depois do primeiro *Code Inspection Report*, os *developers* terem seguido à risca, todas as sugestões e terem aprendido a não cometer os mesmos erros.

Destaca-se ainda que estas novas classes já têm os comentários necessários, algo que era um aspecto a melhorar no *Report* anterior.