*Department of Computer Science*

NOVA School of Science and Technology



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| --- | --- | --- |
| Cl´audia Santos | 57049 | P3 |
| Pedro Grilo | 59213 | P3 |
| Guilherme Fernandes | 60173 | P6 |
| Rui Correia | 60390 | P3 |
| Tom´as Mondim | 60747 | P1 |

## GitHub Project

[https://github.com/sofiasantosgit/SE2223\_57049\_59213\_60173\_60390\_](https://github.com/sofiasantosgit/SE2223_57049_59213_60173_60390_60747/tree/BRANCH_2_8_9) [60747/tree/BRANCH\_2\_8\_9](https://github.com/sofiasantosgit/SE2223_57049_59213_60173_60390_60747/tree/BRANCH_2_8_9)

December 1st 2022

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2. **Phase 1**

## Design Patterns

* + 1. **Cl´audia Santos - 57049 Factory Method Pattern - Task 8**

biz.ganttproject.core.time.CalendarFactory

This is a Factory Method design pattern because it hides the creation of instances of the class GanttCalendar behind a factory class CalendarFactory.

* + - * **Product Object:** GanttCalendar

The object type varies depending on the Locale, instead of having subclasses. The way to

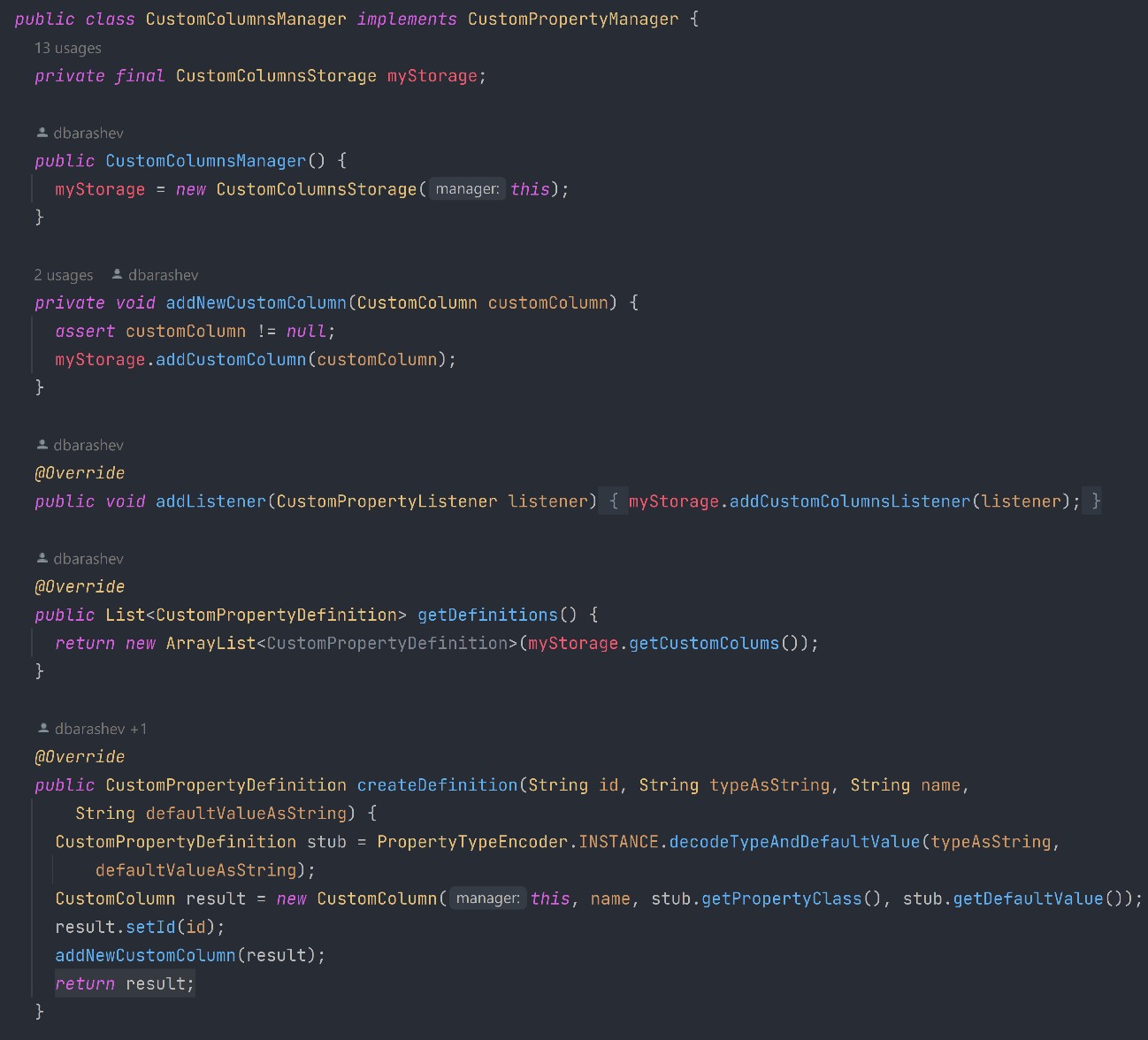
specify the product object type here is by setting the Locale (via the setLocaleApi method).

* + - * **Factory Object:** CalendarFactory
      * **Factory Method:** createGanttCalendar

It’s a static method, so that, even though CalendarFactory isn’t a singleton, the methods

may be called directly from the factory object.

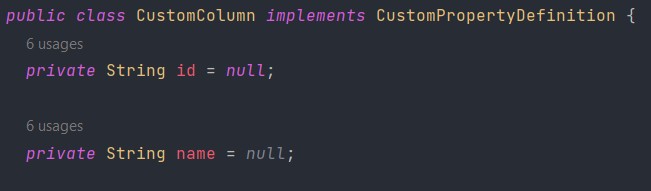
## Fa¸cade Pattern - Task 10



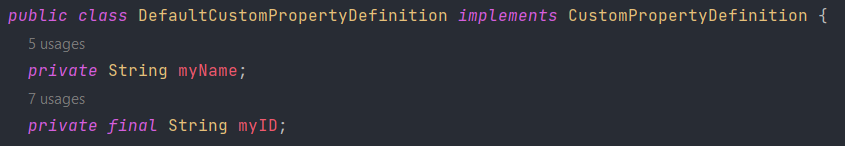
net.sourceforge.ganttproject.task.CustomColumnsManager

This is a Fa¸cade design pattern because it provides a unified interface to a subsystem (the subsystem of classes handling “custom properties”) hiding its complexity, and provides a point of entry to it: the CustomColumnsManager class.

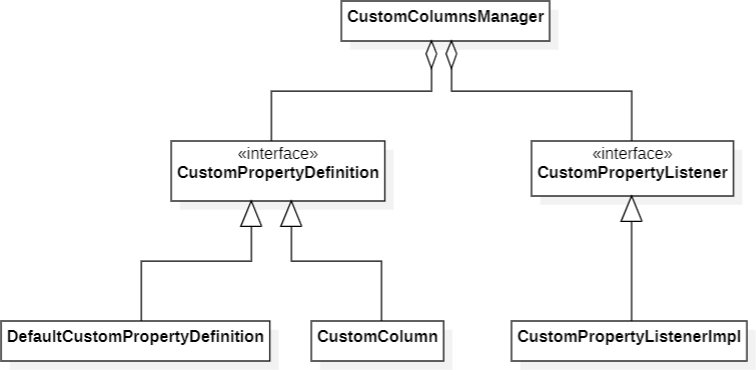
* + - * **Fa¸cade class:** CustomColumnsManager
      * **Interfaces it provides access to:** CustomPropertiesDefinition and CustomPropertyLis- tener (using methods like addNewCustomColumn, addListener, to name a few)



net.sourceforge.ganttproject.task.CustomColumn



net.sourceforge.ganttproject.DefaultCustomPropertyDefinition



An excerpt of the classes that make up this design pattern.

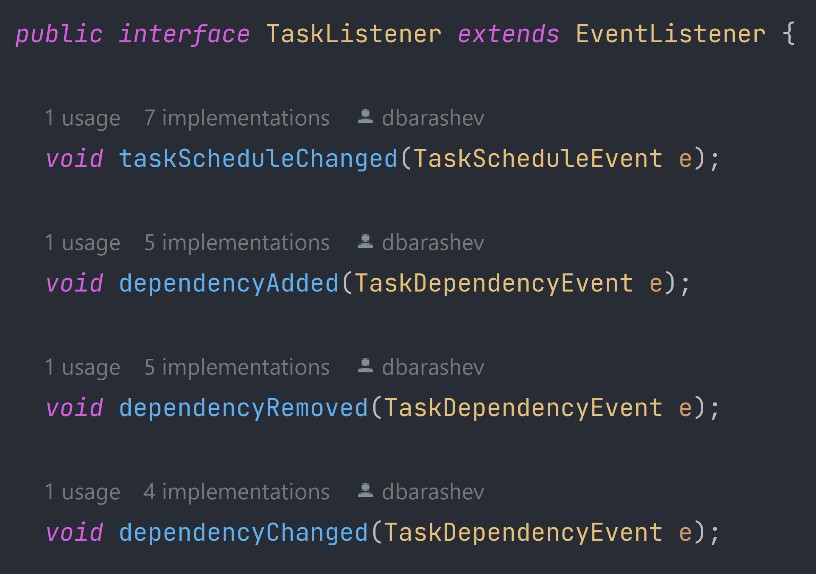
## Adapter Pattern - Task 11



net.sourceforge.ganttproject.task.event.TaskListenerAdapter

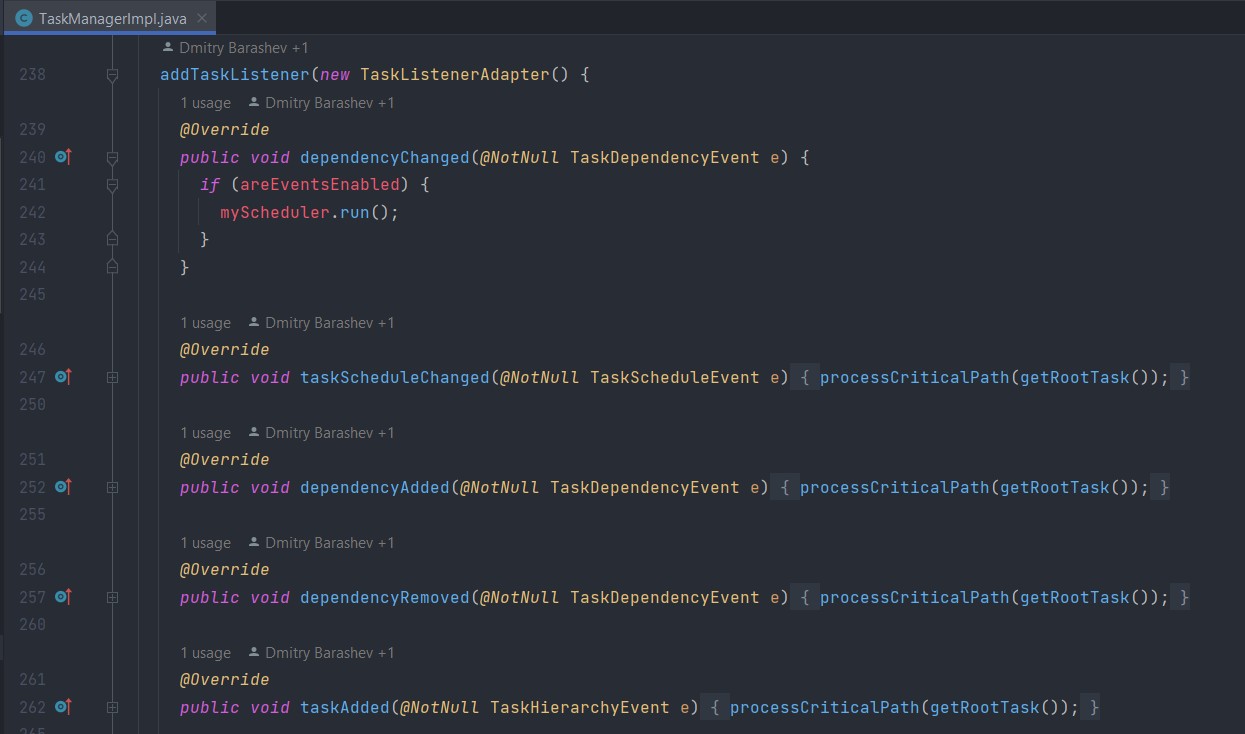
This is an Adapter design pattern because it provides a compatible interface between the event handling services and the client that wants to adapt the handling of events to its needs, which would be incompatible otherwise.

* + - * **Adapter class:** TaskListenerAdapter
      * **Target interface:** TaskListener



net.sourceforge.ganttproject.task.event.TaskListener

An example of a client class that uses this adapter class to adapt the handling of events is TaskMan- agerImpl.



net.sourceforge.ganttproject.task.TaskManagerImpl

## Reviews

**Reviewer Name:** Pedro Grilo

**Design Pattern:** Factory Method Pattern

Deverias mostrar um bocado do construtor da class GanttCalendar. De resto parece-me tudo bem, pois tens uma interface LocalApi que ´e implementada nas classes e depois tens o metodo createGanttCalendar que utiliza o objeto que tem a tua interface. Isto tudo dentro de uma classe chamada CalendarFactory.

**Reviewer Name:** Guilherme Fernandes

**Design Pattern:** Facade Pattern

Fa¸cade class and interfaces nicely pointed out. Bonus points for the uml diagram! Looks good to me!

**Reviewer Name:** Rui Correia

**Design Pattern:** Adapter Pattern

Maybe show some more classes where the adapter is used. Other than that it looks fine.

## Pedro Grilo - 59213 Fa¸cade Pattern - Task 1

**Fa¸cade class:** UIFacadeImpl

E ´e utilizada no GanttProjectBase.java na **linha 215**.



## Factory Pattern - Task 2

Existe a class Factory (FontAwesomeIconFactory), que d´a extends `a GlyphsFactory.



Na class Components.kt, no m´etodo buildFontAwesomeButton, usa se para criar um bot˜ao do tipo FontAwesomeIcon.

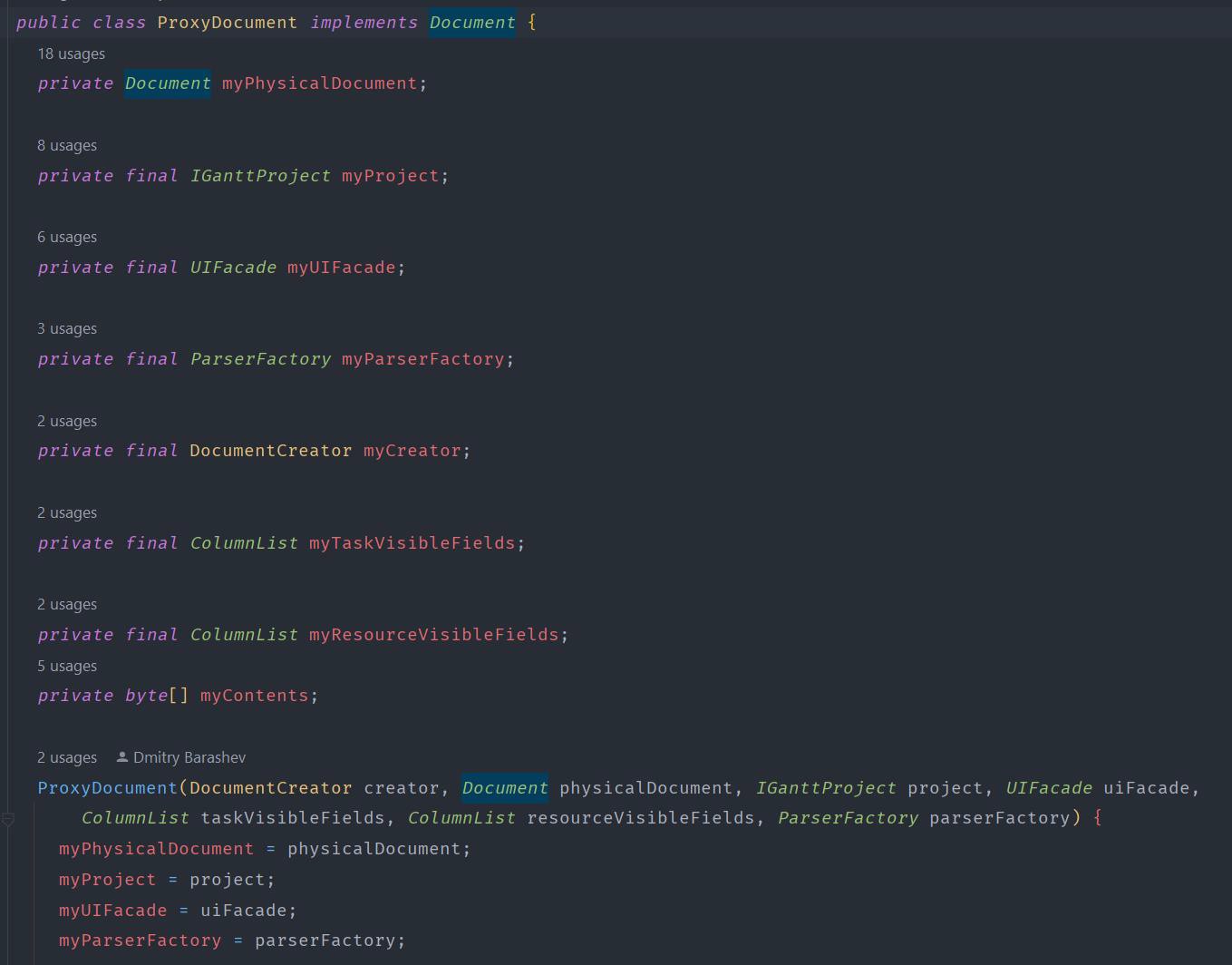
## Proxy Pattern - Task 5



Concrete classes implementing the same interface:



AbstractDocument.java



ProxyDocument.java

## Reviews

**Reviewer Name:** Tom´as Mondim

**Design Pattern:** Facade Pattern

Parece-me bem, apenas peca de uma explica¸c˜ao sobre o porque deste ser um Facade Pattern. Falta tamb´em a localiza¸c˜ao das classes.

**Reviewer Name:** Cl´audia Santos

**Design Pattern:** Factory Method Pattern

The exact location of the code snippets in the codebase should be provided. Should show a code snippet of the Factory Method ”createIconFactory” and explain that that’s the main way to obtain instances of the class FontAwesomeIcon. Hiding the creation of objects is the purpose of this pattern.

**Reviewer Name:** Rui Correia

**Design Pattern:** Proxy Pattern

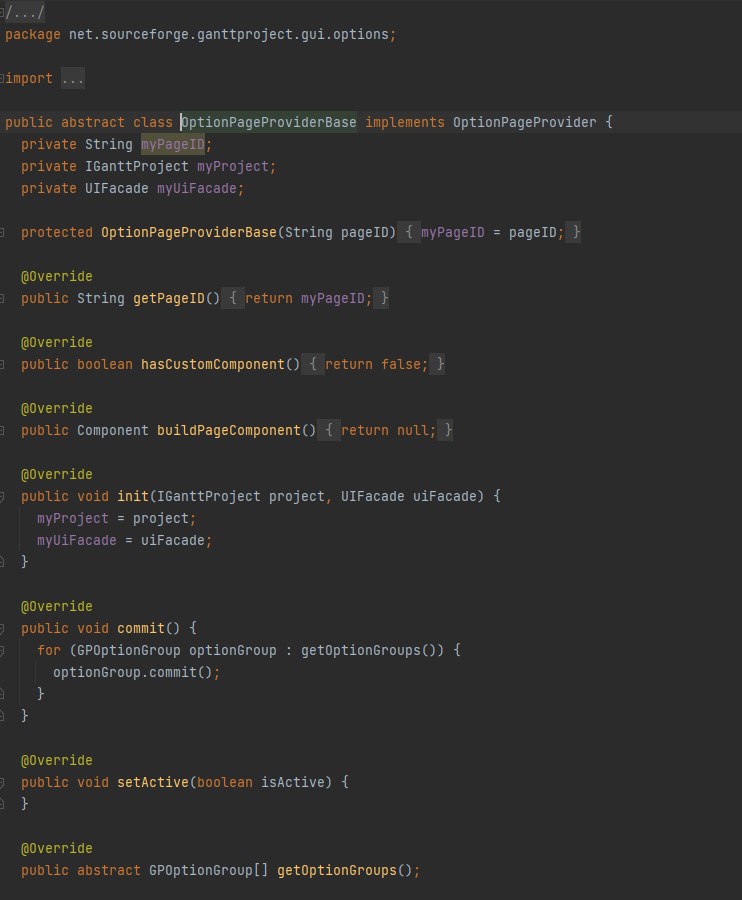
Maybe explain how that interface is used in those classes.

## Rui Correia - 60390 Singleton Pattern - Task 7



java/net/sourceforge/ganttproject/document/webdav/MiltonResourceFactory.java Ensures the creation of only one Milton Resource for each user (given its username and password).

## Decorator Pattern - Task 9



ganttproject/src/main/java/net.sourceforge.ganttproject/gui/options

**Decorator:** OptionPageProviderBase

**ConcreteDecorators:** ProjectBasicOptionPageProvider, ProjectCalendarOptionPageProvider, ProjectRolesOptionPageProvider, ResourceChartOptionPageProvider, entre outros.

## Interpreter Pattern - Task 15

ganttproject/src/main/java/net.sourceforge.ganttproject/language/GanttLanguage.java Interpretador para a linguagem Gantt.

## Reviews

**Reviewer Name:** Cl´audia Santos

**Design Pattern:** Singleton Pattern

All code snippets should have a label identifying their exact location on the codebase. The expla- nation as for why it’s a Singleton is not enough.

There should be an explanation about how the ”myUIConfig” is this class’ uniqueInstance, and that clients access the sole instance of UIConfiguration only using its access point ”getUIConfiguration”.

**Reviewer Name:** Pedro Grilo

**Design Pattern:** Decorator Pattern

Parece tudo ´otimo, pois mostra a classe abstrata OptionPageProviderBase e identificas todas as classes que utilizam essa abstrata. Todas essas classes adicionam funcionalidades ao objeto sem alterar a estrutura, tal como ´e pedido no Decorator Pattern.

Podia ter prints de snippets de code das classes que utilizam OptionPageProviderBase.

**Reviewer Name:** Tom´as Mondim

**Design Pattern:** Interpreter Pattern

Deveria ter uma explica¸c˜ao sobre o porquˆe desta classe usar o Interpreter Method. De resto est´a simples e claro!

## Guilherme Fernandes - 60173 Template Pattern - Task 3

ganttproject/src/main/java/net.sourceforge.ganttproject/io

**Superclasse:** SaverBase

**Subclasses:** ResourceSaver, VacationSaver, ViewSaver, HistorySaver, OptionSaver, entre outros.

## Singleton Pattern - Task 4

java/net/sourceforge/ganttproject/GanttOptions.java Ensures that only one UIConfig is created for each GanttOption.



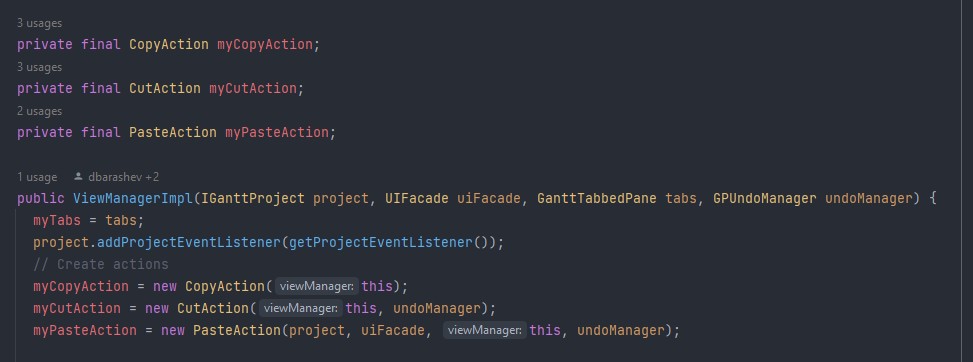


## Command Pattern - Task 6



java/net/sourceforge/ganttproject/gui/view/ViewManagerImpl.java

ViewHolder has access to a ViewManager that is responsible to create and call classes to perform certain actions.



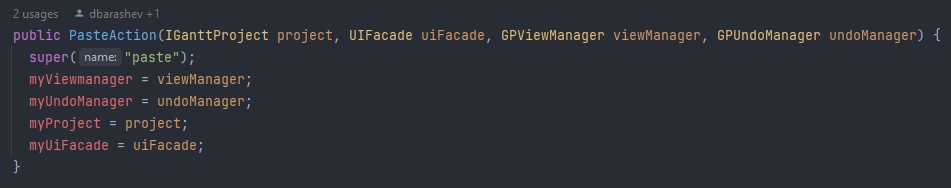
**Base Class (object creator):** ViewManager

**Created Classes (actions):**

* CopyAction
* CutAction
* PasteAction







## Reviews

**Reviewer Name:** Rui Correia

**Design Pattern:** Template Pattern

Should add some more info about the subclasses (maybe some pics or explanation of implementa- tion). Apart from that looks good to me!

**Reviewer Name:** Tom´as Mondim

**Design Pattern:** Singleton Pattern

Deverias explicar a print 1, passa um pouco despercebido o porque de teres colocado a print. De resto parece me certo!

**Reviewer Name:** Rui Correia

**Design Pattern:** Command Pattern

Explain how each command is interpreted and executed.

## Tom´as Mondim - 60747 Fa¸cade Pattern - Task 12

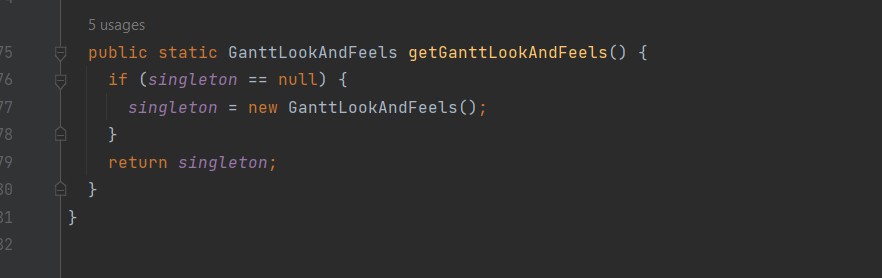


net/sourceforge/ganttproject/GanttProjectBase.java

Encontrei uma Fa¸cade classe (GanttProjectBase) que vai servir de “interface” para a cria¸c˜ao dos outros objetos ditos subclasses.

## Singleton Pattern - Task 13

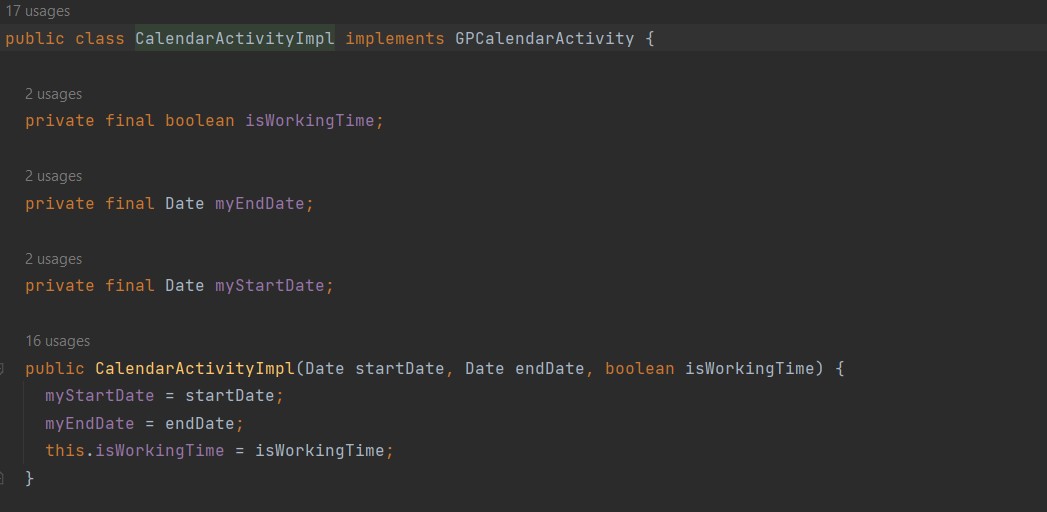




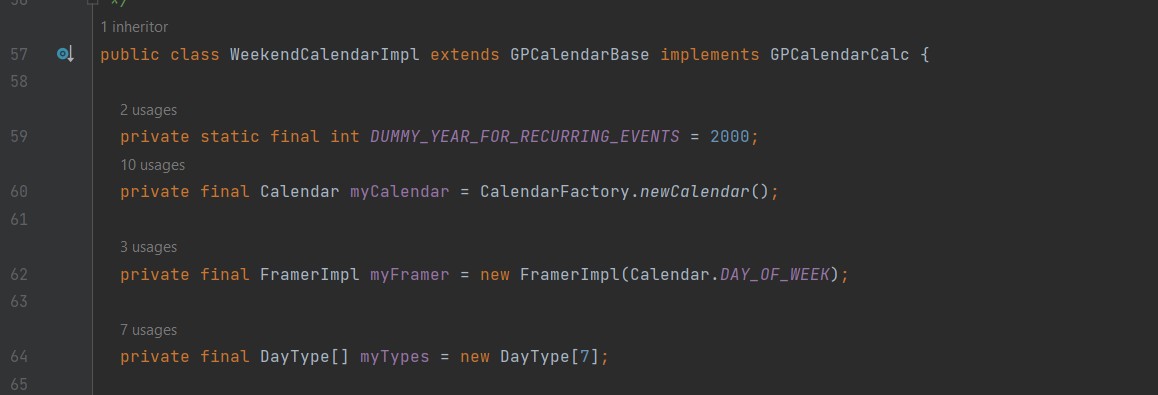
net/sourceforge/ganttproject/gui/GanttLookAndFeels.java

Basicamente, este vai ser o u´nico ponto de acesso para cria¸c˜ao deste objeto assegurando a cria¸c˜ao de apenas um, neste caso sendo usada no UIFacade.

## Decorator Pattern - Task 14







biz.ganttproject.core/src/main/java/biz.ganttproject/core/calendar

Encontrei um Decorator, que tem como base o GpcCalendarBase e tem pelo menos as duas dec- orator classes que est˜ao nos prints, todas com o mesmo tipo e que adicionam coisas diferentes ao mesmo objeto.

* **Component interface:** GPCCalendar
* **Base object:** GPCCalendarBase
* **Decorators:** WeekendCalendarImpl and AlwaysWorkingTimeCalendarImpl

## Reviews

**Reviewer Name:** Guilherme Fernandes

**Design Pattern:** Fa¸cade Pattern

Should explain the complexity hidden behind the fa¸cade.

**Reviewer Name:** Pedro Grilo

**Design Pattern:** Singleton Pattern

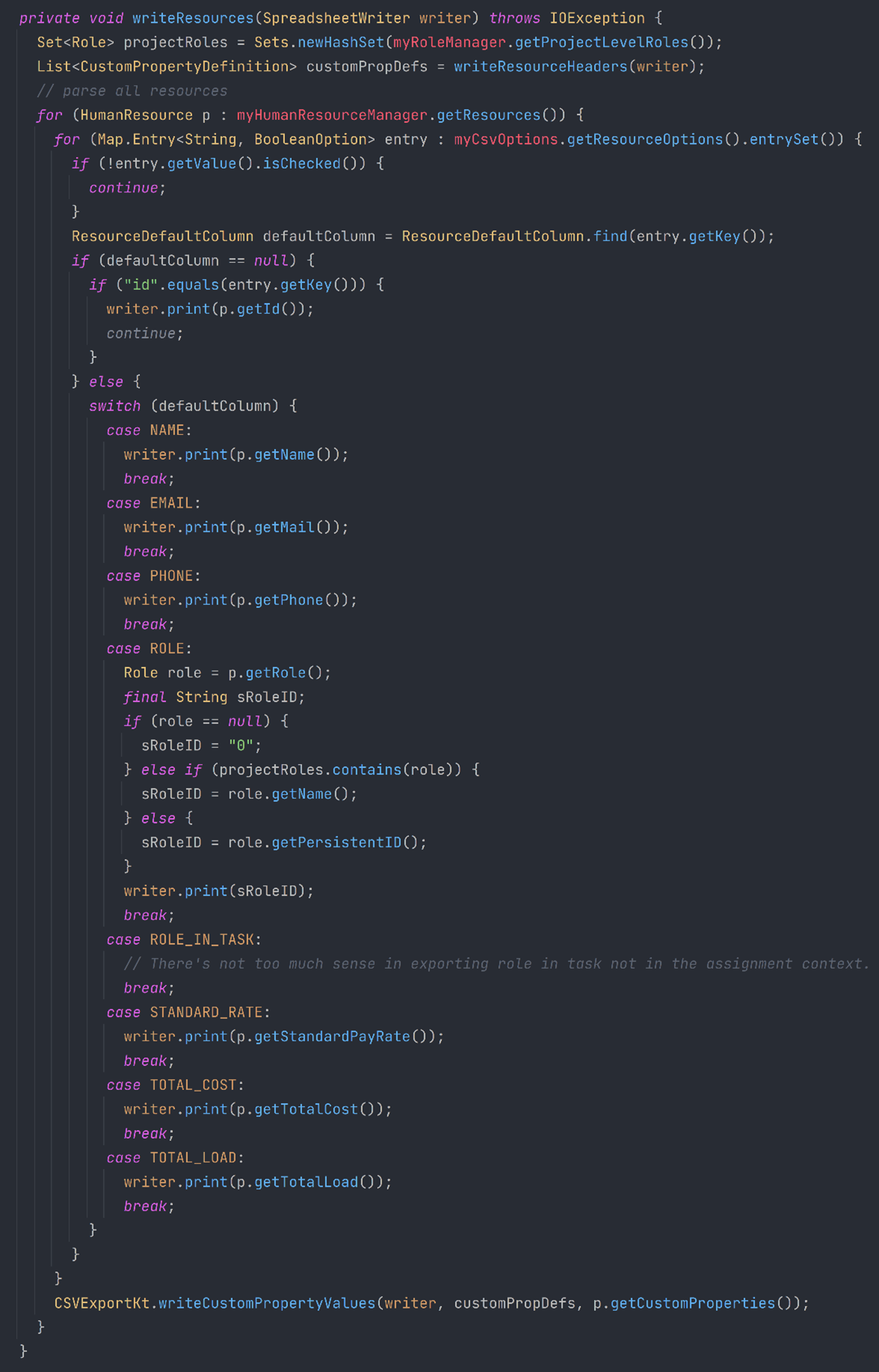
Est´a correto, pois garante que o GanttLookAndFeels cria apenas um, usando assim o return do Singleton. Podias mostrar uma print do snippet do code onde ´e usado.

**Reviewer Name:** Cl´audia Santos

**Design Pattern:** Decorator Pattern

The identification of the Decorator design pattern seems to be correct, with all the class relation- ships required by this pattern. There should be some grammar fixes in the report.

## Code Smells

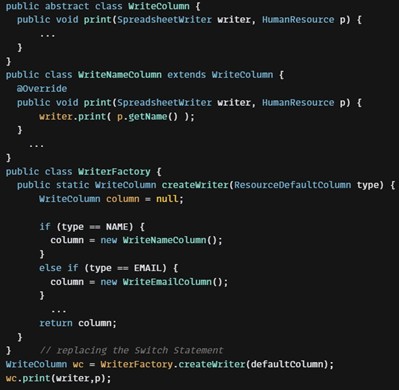
* + 1. **Cl´audia Santos - 57049 Switch Statement - Task 4**

biz.ganttproject.impex.csv.GanttCSVExport

This code snippet is a Switch Statement code smell because it is a very long switch statement that can be handled better using polymorphism.

**Refactoring:** creating an abstract class WriteColumn with subclasses (WriteNameColumn, WriteEmail- Column, etc..) that implement their own print method, and creating a factory that generates those instances depending on the type provided. This way, the client only needs to call the print method

once. Here’s the stub of a refactoring:



## Long Parameter List - Task 5

net.sourceforge.ganttproject.task.algorithm.AlgorithmCollection This code snippet is a Long Parameter List code smell because it has 8 parameters.



net.sourceforge.ganttproject.task.TaskManagerImpl

As seen in this code snippet from TaskManagerImpl, the arguments of the AlgorithmCollection constructor are just results of method calls to other classes, so we can pass this object as the sole parameter and let AlgorithmCollection get the values that it needs by itself.

**Refactoring:** the AlgorithmCollection constructor should only receive the taskManager, critical- PathAlgorithm and scheduler parameters. It has all it needs to infer the other algorithm objects in its constructor method.

## Dead Code - Task 6



net.sourceforge.ganttproject.document.DocumentCreator

This method makes up a Dead Code code smell because it is no longer used anywhere.

**Refactoring:** since it is not being used anymore, it can simply be deleted.

## Reviews

**Reviewer Name:** Rui Correia **Code Smell:** Switch Statement Good find and good suggestion.

**Reviewer Name:** Guilherme Fernandes **Code Smell:** Long Parameter List Looks good to me!

**Reviewer Name:** Pedro Grilo **Code Smell:** Dead Code Parece me correto!

## Pedro Grilo - 59213 Dead Code - Task 1

Na classe net.sourceforge.ganttproject.gui.taskproperties.CommonPanel. H´a um m´etodo est´atico setupTableUI que nunca ´e utilizado!



Para resolver este problema, podemos simplesmente remover, pois n˜ao vai interferir com o fun- cionamento do resto da classe. E assim sendo, o c´odigo da classe fica mais pequeno e mais simples!

## Long Parameter List - Task 2

No construtor da classe net.sourceforge.ganttproject.chart.gantt. GanttChartController, s˜ao pas- sados demasiados parˆametros (8) e n˜ao est´a comentado!

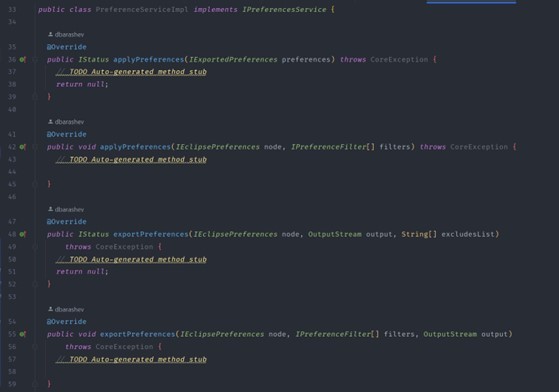
M´etodos/Construtores com v´arios parˆametros devem ser devidamente comentados para facilitar a implementa¸c˜ao do mesmo.

Uma boa pr´atica poder´a ser resumir os parˆametros em conjunto de objetos.



## Speculative Generality - Task 3

Na classe PreferenceServiceImpl do package net.sourceforge.ganttproject, todos os m´etodos da class foram criados a pensar em ter utilidade no futuro.



## Reviews

**Reviewer Name:** Cl´audia Santos

**Code Smell:** Dead Code

The identification of the code smell seems to be correct, and the suggestion is clear enough.

**Reviewer Name:** Tom´as Mondim

**Code Smell:** Long Parameter List

Poderia ser mais espec´ıfico e conciso na altera¸c˜ao, seja para os parˆametros, seja para os coment´arios, que apesar de ser ´obvio n˜ao sugere altera¸c˜ao. De resto parece me bem!

**Reviewer Name:** Guilherme Fernandes

**Code Smell:** Speculative Generality

Lacks a suggestion of a different implementation. Other than that looks good!

## Rui Correia - 60390 Duplicated Code - Task 7

ganttproject/src/main/java/net/sourceforge/ganttproject/document/FtpDocument.java Podia ser resolvido criando uma vari´avel que guardasse a String usada.

## Dead Code - Task 8

ganttproject/src/main/java/net/sourceforge/ganttproject/document/DocumentsMRU.java O c´odigo comentado devia ser removido.

## Long Method without Comments - Task 9



ganttproject/src/main/java/net/sourceforge/ganttproject/language/GanttLanguage Deviam adicionar coment´arios para ajudar a entender o c´odigo.

## Reviews

**Reviewer Name:** Pedro Grilo

**Code Smell:** Duplicated Code

Sim, refereste a c´odigo duplicado, mas a tua sugest˜ao podia ter que o catch podia ter um ”OR” como condi¸c˜ao e assim tamb´em evitava a repeti¸c˜ao de c´odigo. De resto est´a ok!

**Reviewer Name:** Guilherme Fernandes

**Code Smell:** Dead Code

Should show the rest of the method to check if the commented code doesn’t affect the usual behaviour. Maybe add some prints of the places where this method is called.

Podia ter prints de snippets de code das classes que utilizam OptionPageProviderBase.

**Reviewer Name:** Tom´as Mondim

**Code Smell:** Long Method without Comments

Falta uma explica¸c˜ao mais detalhada de que tipo de coment´arios se deveria adicionar. Falta uma sugest˜ao de altera¸c˜ao para o facto do m´etodo ser muito longo.

## Guilherme Fernandes - 60173 Dead Code - Task 13

java/net/sourceforge/ganttproject/gui/UIConfiguration.java

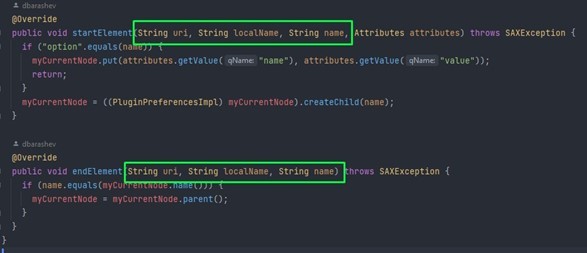
The parameter taskColor is never used and doesn’t alter the result of the code. Whatever colour is passed, the behaviour of the code will be the same.



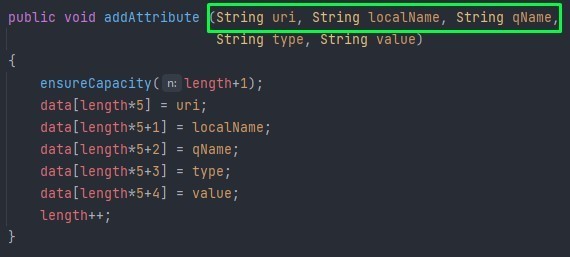
In this example, the highlighted parameter will never be used.

**Suggestion:** Remove the parameter from the method so it’s less confusing and doesn’t make the user need to input useless information.

## Data Clump - Task 14



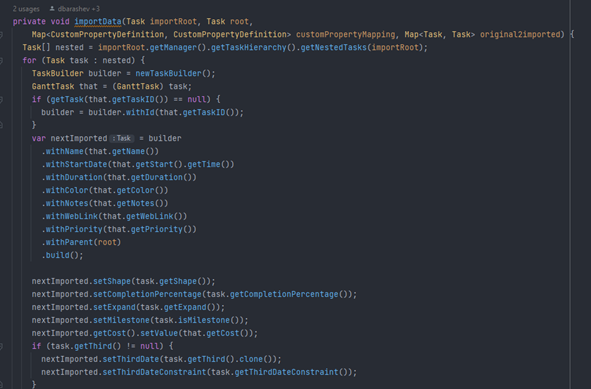
java/net/sourceforge/ganttproject/GanttOptions.java



This data group is passed, several times, as parameters.

**Suggestion:** Create a class to store this data group and all its methods.

## Long Method without Comments - Task 15



java/net/sourceforge/ganttproject/task/TaskManagerImpl.java



This method is long and has a high Cognitive Complexity but has no comments.

**Suggestion 1:** Add comments to facilitate code maintenance.

**Suggestion 2:** Split the method into shorter and task-focused ones.

## Reviews

**Reviewer Name:** Rui Correia

**Code Smell:** Dead Code

Boa identifica¸c˜ao do code smell e uma boa sugest˜ao. Podia ter uma melhor apresenta¸c˜ao, mas de resto est´a bom.

**Reviewer Name:** Cl´audia Santos

**Code Smell:** Data Clump

A classifica¸c˜ao do code smell parece estar correta. Deviam talvez estar mencionados quais m´etodos iriam para a classe nova, tendo cuidado que esta n˜ao se tornasse um Data Class code smell.

**Reviewer Name:** Tom´as Mondim

**Code Smell:** Long Method without Comments

Talvez referir que tipo de coment´arios deveriam ser adicionados. Para al´em disto parece bem!

## Tom´as Mondim - 60747 Dead Code - Task 10

biz/ganttproject/core/chart/scene/BottomUnitSceneBuilder.java

O parˆametro curDate nunca ´e utilizado neste m´etodo, n˜ao fazendo qualquer sentido a presen¸ca. Qualquer que seja o valor do parˆametro, o c´odigo n˜ao ´e alterado...

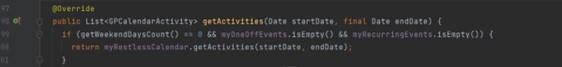


Aqui, por exemplo o offset.getOffsetStart() nunca ser´a utilizado. **Suggestion:** Apenas remover este parˆametro e nunca o chegar a enviar a quando da chamada do m´etodo.

## Duplicated Code - Task 11



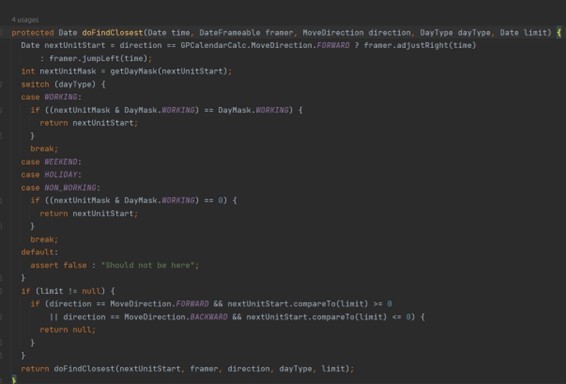
biz/ganttproject/core/calendar/WeekendCalendarImpl.java



Esta verifica¸c˜ao encontra se repetida ao longo do c´odigo.

**Sugest˜ao:** Uma poss´ıvel sugest˜ao seria criar um m´etodo privado que estivesse encarregado de fazer estas verifica¸c˜oes e deste modo acabar com c´odigo duplicado.

## Long Method without Comments - Task 12



biz/ganttproject/core/chart/scene/BottomUnitSceneBuilder.java

Este c´odigo peca pois, para al´em de ser bastante complexo. necessita de coment´arios para ajudar tanto na interpreta¸c˜ao do c´odigo por pessoas de for a como para futura manuten¸c˜ao.

**Sugest˜ao:** Utiliza¸c˜ao de coment´arios que expliquem o funcionamento do c´odigo tal como ex- plica¸c˜ao dos parˆametros recebidos e do retorno do m´etodo.

## Reviews

**Reviewer Name:** Rui Correia

**Design Pattern:** Dead Code

The dead code detection seems to be correct and well explained, as well as the suggestion. Only fix would be some grammar errors.

**Reviewer Name:** Cl´audia Santos

**Design Pattern:** Duplicated Code

The code smell identification seems to be correct, and the suggestion makes sense. The explanation could have some grammar fixes.

**Reviewer Name:** Pedro Grilo

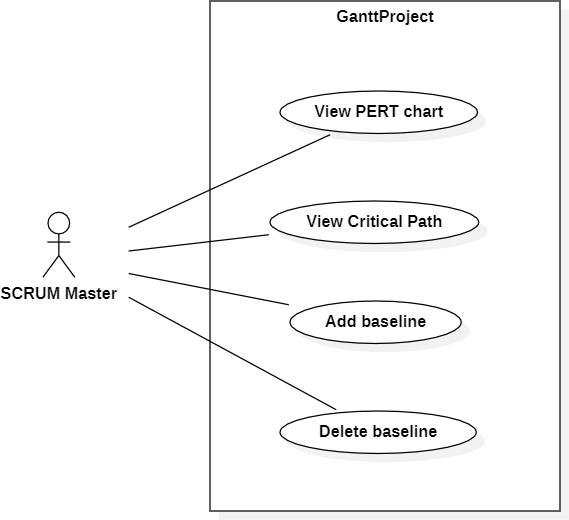
**Design Pattern:** Long Method without Comments

O c´odigo identificado parece estar correto e de acordo com o code smell ”Long Method without Comments”. Cont´em uma boa explica¸c˜ao de sugest˜ao! Cont´em alguns erros de gram´atica!

# Phase 2

## Use Cases

* + 1. **Cl´audia Santos - 57049 Use Case Diagram**



## Use Case Descriptions

**Use Case ID: 1**

**Use Case name:** View PERT chart

**Use Case description:** The SCRUM Master selects the option to view their Gantt chart as a PERT chart.

**Primary actor:** SCRUM Master

**Secondary actor:** None

**Use Case ID: 2**

**Use Case name:** View Critical Path

**Use Case description:** The SCRUM Master selects the option to view the critical path of their project tasks.

**Primary actor:** SCRUM Master

**Secondary actor:** None

**Use Case ID: 3**

**Use Case name:** Add baseline

**Use Case description:** The SCRUM Master adds a baseline of their current Gantt chart to the project.

**Primary actor:** SCRUM Master

**Secondary actor:** None

**Use Case ID: 4**

**Use Case name:** Delete baseline

**Use Case description:** The SCRUM Master deletes a baseline from the project.

**Primary actor:** SCRUM Master

**Secondary actor:** None

## Reviews

* + 1. **Pedro Grilo - 59213 Use Case Diagram**



## Use Case Descriptions

**Use Case ID: 5**

**Use Case name:** Add task predecessor

**Use Case description:** O developer adiciona uma task predecessor, mas ´e preciso uma task primeiro.

**Primary actor:** Developer

**Secondary actor:** None

**Use Case ID: 6**

**Use Case name:** Add task

**Use Case description:** O developer adiciona uma task, para mais tarde ser utilizada como pre- decessor.

**Primary actor:** Developer

**Secondary actor:** None

**Use Case ID: 7**

**Use Case name:** Delete Task predecessor

**Use Case description:** O developer remove uma task predecessor de uma task.

**Primary actor:** Developer

**Secondary actor:** None

## Reviews

* + 1. **Rui Correia - 60390 Use Case Diagram**



**Use Case ID: 8**

**Use Case name:** Add Resource

**Use Case description:** O Project Manager adiciona o recurso para que ele possa no futuro par- ticipar em tasks.

**Primary actor:** Project Manager

**Secondary actor:** None

**Use Case ID: 9**

**Use Case name:** Delete Resource

**Use Case description:** O Project Manager remove recursos que j´a n˜ao tˆem interesse para a continua¸c˜ao do projeto.

**Primary actor:** Project Manager

**Secondary actor:** None

**Use Case ID: 10**

**Use Case name:** Edit Resource Properties

**Use Case description:** O Project Manager atualiza informa¸c˜oes relativas a um resource de forma a atualizar informa¸c˜oes desatualizadas como o nome ou a role.

**Primary actor:** Project Manager

**Secondary actor:** None

**Use Case ID: 11**

**Use Case name:** Link Resource to Tasks

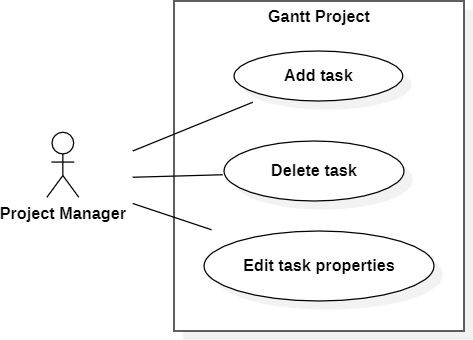
**Use Case description:** O Project Manager atribui uma (ou mais) task a um recurso espec´ıfico.

**Primary actor:** Project Manager

**Secondary actor:** None

## Reviews

* + 1. **Guilherme Fernandes - 60173 Use Case Diagram**



## Use Case Descriptions

**Use Case ID: 12**

**Use Case name:** Criar task

**Use Case description:** Um project manager cria uma task.

**Primary actor:** Project Manager

**Secondary actor:** None

**Use Case ID: 13**

**Use Case name:** Delete task

**Use Case description:** Um project manager apaga a task.

**Primary actor:** Project Manager

**Secondary actor:** None

**Use Case ID: 14**

**Use Case name:** Edit task properties

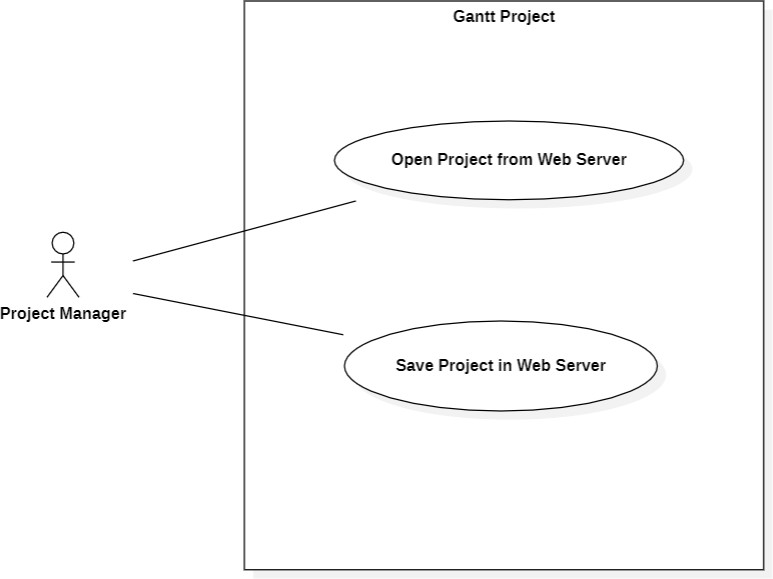
**Use Case description:** Um project manager edita as propriedades de uma task.

**Primary actor:** Project Manager

**Secondary actor:** None

## Reviews

* + 1. **Tom´as Mondim - 60747 Use Case Diagram**



## Use Case Descriptions

**Use Case ID:** 16

**Use Case name:** Open Project from Web Server

**Use Case description:** Um Project Manager precisa de abrir um projeto que esteja num servidor web.

**Primary Actor:** Project Manager

**Secondary Actor:** None

**Use Case ID:** 17

**Use Case name:** Save Project to Web Server

**Use Case description:** Um Project Manager precisa de guardar um projeto realizado, num servidor web.

**Primary Actor:** Project Manager

**Secondary Actor:** None

## Reviews

## Novas funcionalidades

## Possibilidade de anexar ficheiros a cada tarefa

**Exemplo:** Estamos a rever v´arios documentos *Word* com milhares de linhas, e queremos deixar anexados os documentos nas tarefas a que est˜ao associados para os abrir mais rapidamente e sem os confundir.

**User Stories**

As a developer, I want to attach the code file of my project to its task, so that I can open the code associated to this task faster.

**Use Case Descriptions**

**Use Case ID: 18**

**Use Case name:** Adicionar ficheiro

**Use Case description:** Um gestor de projeto adiciona um ficheiro relacionado a uma task.

**Primary actor:** Gestor de projeto

**Secondary actor:** None

**Use Case ID: 19**

**Use Case name:** Apagar ficheiro

**Use Case description:** Um gestor de projeto apaga um ficheiro relacionado a uma task.

**Primary actor:** Gestor de projeto

**Secondary actor:** None

## Acrescentar to-do list a cada tarefa

**Exemplo:** Ter uma to-do list dentro de cada tarefa, onde se apontam sub-tarefas para resolver, com a possibilidade de as marcar como completas ou n˜ao.

**User Stories**

As a student, I want to have a list with the code smells I’m looking for in a task, so that I can monitor my progress more easily.

**Use Case Descriptions Use Case ID: 20**

**Use Case name:** Adicionar To-Do

**Use Case description:** Um gestor de projeto adiciona um To-Do a uma task.

**Primary actor:** Gestor de projeto

**Secondary actor:** None

**Use Case ID: 21**

**Use Case name:** Apagar To-Do

**Use Case description:** Um gestor de projeto apaga um To-Do de uma task.

**Primary actor:** Gestor de projeto

**Secondary actor:** None