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| Fontys ICT |
| pattern |
| Design patterns |

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# Introduction

The goal of this document is to give an overview over the observer pattern by giving an example implementation which leverages real weather data gathered through the *OpenWeatherMapApi*. Furthermore, reusability, extensibility, and maintainability of this pattern are elaborated. Also, the implementation, its unit test and graphical user interface (GUI) are reviewed.

# Observer Pattern

The observer pattern is a software design pattern which consists most commonly of two objects, the subject and observer. The pattern describes a relationship of one subject and zero, one, or more observers. The observer can attach or subscribe to the subject and if the subject’s data source changes the subject notifies all its observers about the change.

The main benefit the observer pattern provides is a clean separation between business logic and display layer.

# Implementation

Figure 1: Class diagram

The figure above depicts a class diagram of the implementation of a WPF application that showcases weather data in real time.

## Explanation of classes

This subchapter gives a descriptive explanation of the observer patterns implementation, such as methods, properties or fields.

### ISubject

*ISubject* defines the subject interface.

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| **ISubject** | | |
| Type | Definition | Explanation |
| Method | + Attach(IObserver observer): void | Attach an observer to the subject. |
| Method | + Detach(IObserver observer): void | Detach an observer from the subject. |
| Method | + Notify(): void | Notify all observers of data source change. |

### Subject

*Subject* is an abstract class which implements *ISubject*.

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| **Subject** | | |
| Type | Definition | Explanation |
| Property | Observers : List<IObserver> | List of attached observers.. |
| Method | + Attach(IObserver observer): void | Attach an observer to the subject. |
| Method | + Detach(IObserver observer): void | Detach an observer from the subject. |
| Method | + Notify(): void | Notify all observers of data source change. |

### WeatherSubject

The *WeatherSubject* implements the abstract class *Subject*.

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| **WeatherSubject** | | |
| Type | Definition | Explanation |
| Method | + ReadRequest(List<Request> requests, Request request) : Request | The interface method which strategies derive from |

### WeatherAlertSubject

The *WeatherAlertSubject* implements all methods form abstract class *Subject*. This is the second subject which is implemented in a pull request method.

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| --- | --- | --- |
| **WeatherAlertSubject** | | |
| Type | Definition | Explanation |
| Method | + ReadRequest(List<Request> requests, Request request) : Request | The interface method which strategies derive from |

### IObserver

*ISubject* holds the methods of the Observer pattern Subject interface: Attach, Detach, Notify.

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| **IObserver** | | |
| Type | Definition | Explanation |
| Method | + Update(object data): void | The interface method which strategies derive from |

## Features

# Design choices

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# Graphical user interface

Figure 2: User Interface of the application

# Unit tests

For each implemented strategy unit tests have been defined to assert correct behavior.

# References

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