FoodGram

Analysis and Design Document

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Revision History

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| --- | --- | --- | --- |
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Table of Contents

I. Project Specification 4

II. Elaboration – Iteration 1.1 4

1. Domain Model 4

2. Architectural Design 4

2.1 Conceptual Architecture 4

2.2 Package Design 5

2.3 Component and Deployment Diagrams 5

III. Elaboration – Iteration 1.2 6

1. Design Model 6

1.1 Dynamic Behavior 6

1.2 Class Design 6

2. Data Model 7

3. Unit Testing 7

IV. Elaboration – Iteration 2 8

1. Architectural Design Refinement 8

2. Design Model Refinement 8

V. Construction and Transition 8

1. System Testing 8

2. Future improvements 8

VI. Bibliography 8

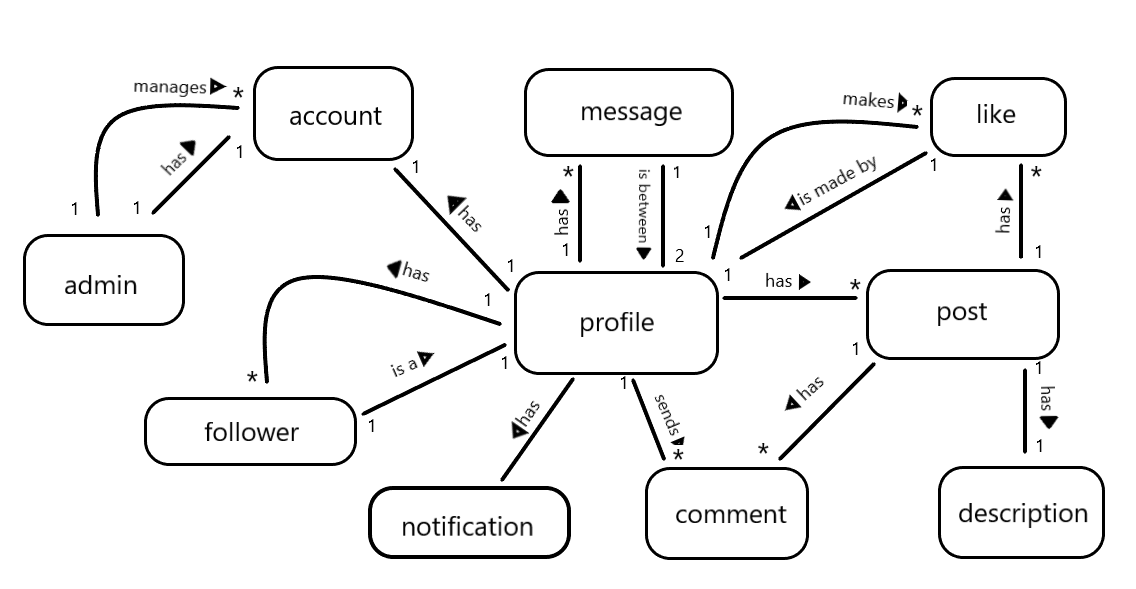
# Project Specification

Foodgram is a web application for a community of people that love making and sharing food recipes. This application will make possible for them to share their taste with others or even communicate with their followers. Every post of an individual will contain an image of a specific food or recipe and a short description of how it is made. Description of the post may be updated in the future, and the user’s information / bio as well.

# Elaboration – Iteration 1.1

# Domain Model

A domain model is a conceptual model of the domain that incorporates both behavior and data. In our case domain elements and the relations between them are described in the following diagram. Elements like username and password are supposed to be incapsulated in the concept called account, and images are part of the concept labeled as post.



# Architectural Design

## Conceptual Architecture

Layered architectural pattern can be used to structure applications that can be decomposed on several sub-application or sub-tasks, each of them representing a different level of abstraction. Each layer provides services for layer above, in this manner, the logic of structuring has a linear flow. As we discussed on previous projects, the layer architectural pattern has 3 main layers:

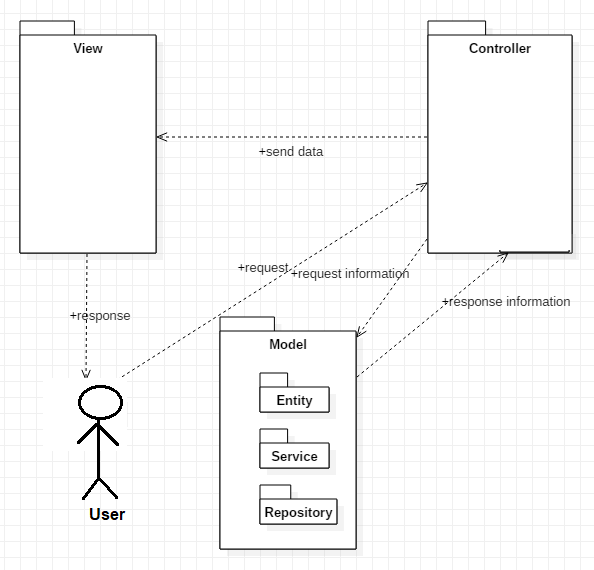
1. Presentation Layer
2. Business Logic Layer or Domain Logic Layer
3. Data Access Layer

Presentation Layer has the highest abstraction level in this system, because everything that requires must be previously implemented and tested to work properly. The presentation Layer is often implemented using another architectural pattern like MVC, MVVM, MP or other derivates of the MVC pattern. The Business Logic Layer consist of classes and interfaces that represent the domain logic and functionality of the application, basically if the application would have no database connection or GUI this would be the only existing layer. Finally, the Data Access Layer which in our case represent only entities and data access object, but in other cases may also contain services from other applications or web services.

Model-View-Controller architectural pattern follows an elementary idea – we must separate the responsibilities in any application on the following basis:

* **Model:** Entities of the application that are represented in GUI.
* View: Presents the data to the user whenever asked for. View represents the visualization of the data that model contains.
* Controller: Entertains user requests and fetch necessary resources. Controller acts on both model and view. It controls the data flow into model object and updates the view whenever data changes. It keeps view and model separate.

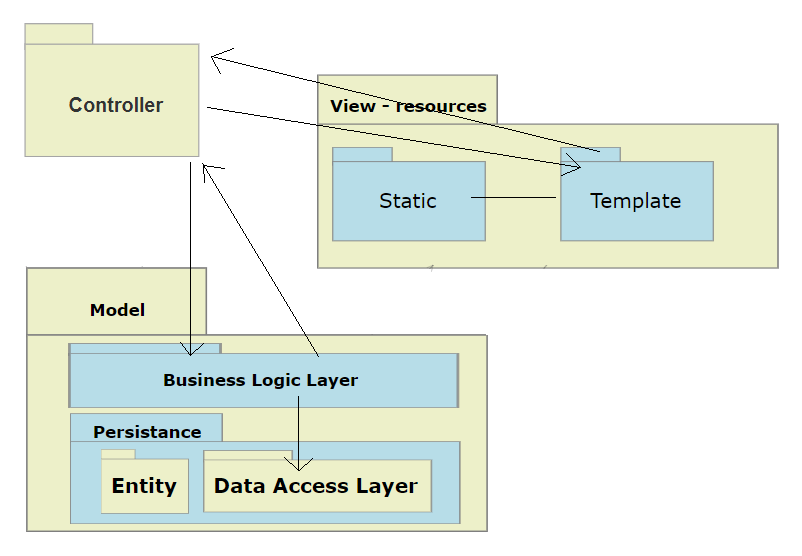
In our implementation the MVC pattern is suited for the Spring Framework, meaning that the concept of model encapsulates both data access and business logic layer, views are represented by HTML pages and the controllers are the connection objects between the main logic and the views.



The motivation for using the specified architectural patterns is to logically structure the application so that intermediar implementation steps and further developments are easily made. In a Java project using Spring framework the first step would be to implement and test the elements of the data access layer, which in our case is represented by the Persistence Layer or Package. After this step the database of the project is automatically generated and the so called, implementation and coding may start. Step by step the Services, which represent the domain logic are added, so the HTML pages the view and the controllers, the mediator between domain logic and presentation are constructed.

## Package Design

The Foodgram application in a Java application constructed with the support of Spring Framework. It is constructed in a Spring web application style using Thymeleaf template engine. This means the MVC architectural pattern is the main pattern on which the application is based. The controller package will contain the controllers for login and signup, administrator and user operation managers. The information from the users side is collected into and displayed on view element, which in out case are stored under resources directory, and has two main packages, static and templates. The templates package contains the HTML views that are used for data display and collection, and the static package contains javascript and css elements, to manage and style the data. The model package is the projects core. It contains services (domain logic), entities and data access object (repositories).



## Component and Deployment Diagrams

A UML component diagram is a physical representation of class diagram. It is used in modeling physical aspects of object-oriented systems that are used for visualizing, specifying and documenting component-based systems, also for constructing executable systems through forward and reverse engineering.

Deployment diagrams show their physical configurations of software and hardware. Deployment Diagram show the structure of the run-time system, capture the hardware that will be used to implement the system and the links between different items of hardware.

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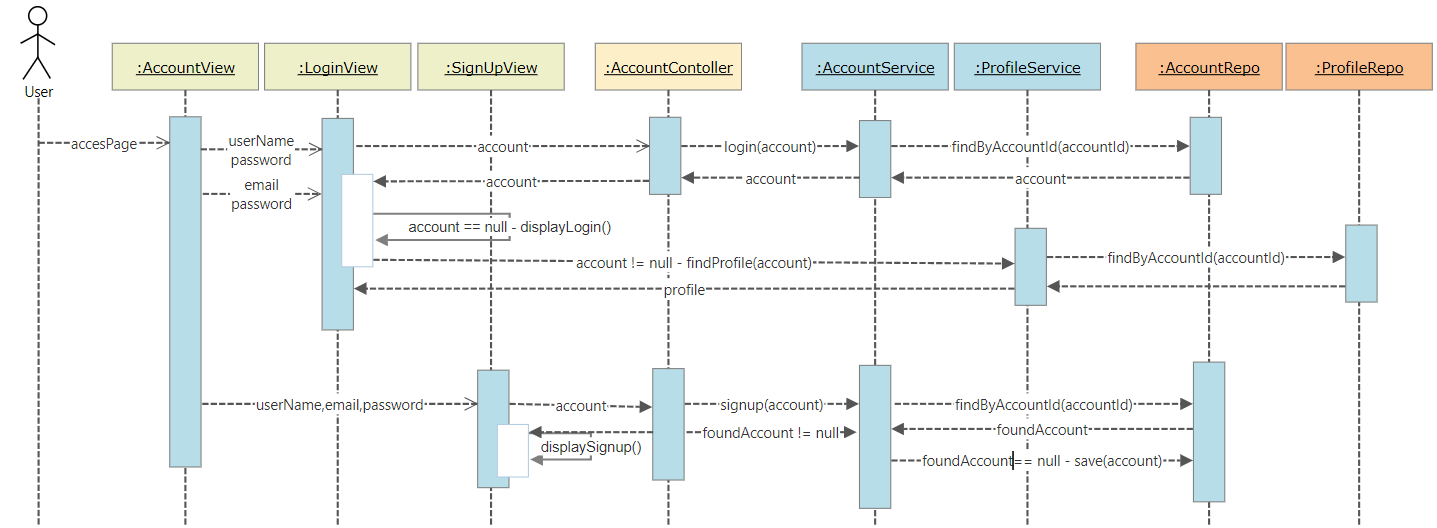
# Elaboration – Iteration 1.2

# Design Model

## Dynamic Behavior

Communication diagram is a kind of UML interaction diagram which shows interactions between objects using sequenced messages in a free-form arrangement. Sequence diagrams are interaction diagrams that detail how operations are carried out. They capture the interaction between objects in the context of the collaboration. Sequence diagrams are time focused and they show the order in which the interactions are made (vertical axis represent an object time line).

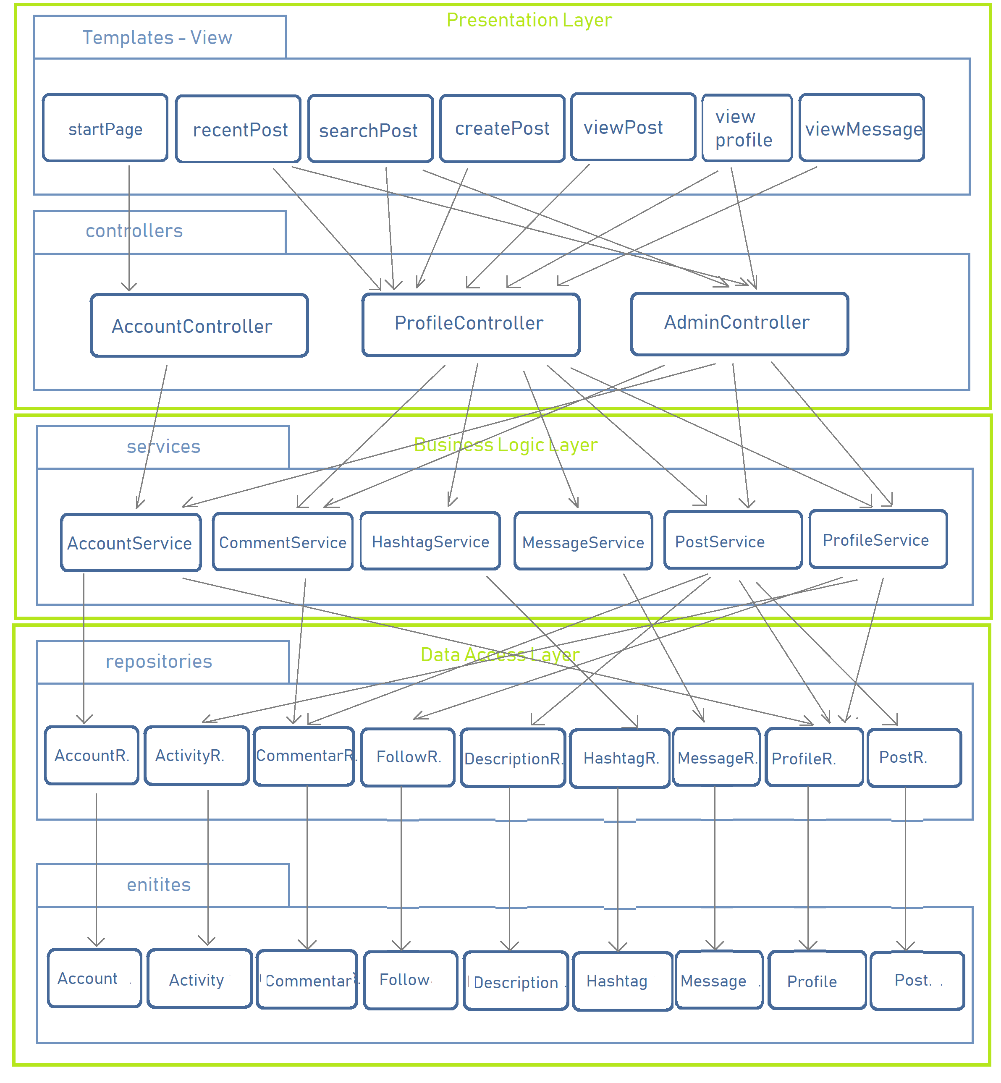
In the following section it will be presented the account management diagram, meaning login and signup operations and a presentation of communication between service – business logic and data access objects.



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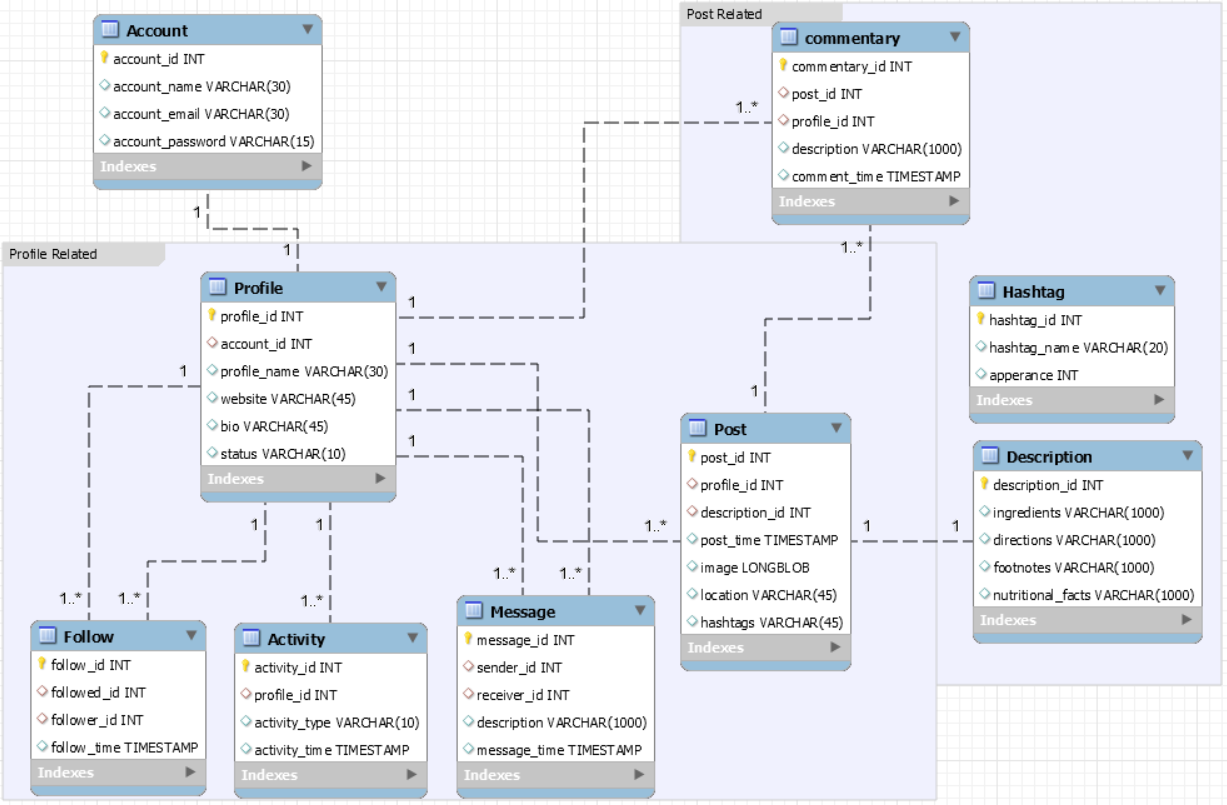
## Class Design

Design of this project is structured using Layers and Model-View-Controller architectural patterns. Considering this, it is needed a separation on layers of classes and their relations.



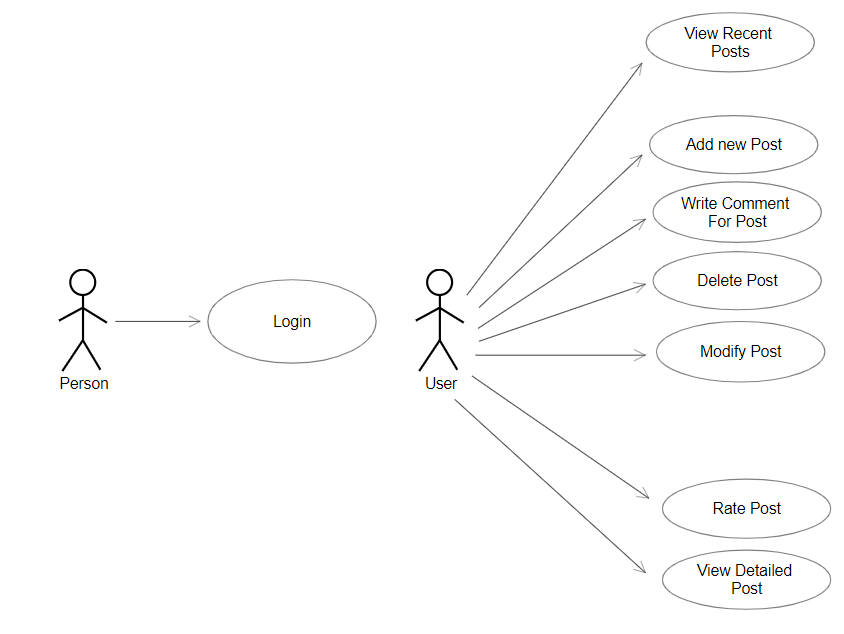
# Data Model

The Data Model of this project represents the entities and relations between them.



# Unit Testing

Testing in case of this project is made using Junit 4, which is integrated in Spring. In the main testing class we injected all repositories and tested them individually for each main operation: save, delete and find by different attribute names. This testing unit is also including some use case testing, for example login and signup operation. All use-case operations need to be tested but there are some of them that require the interface elements too.



# Elaboration – Iteration 2

# Architectural Design Refinement

# Design Model Refinement

# Construction and Transition

# System Testing

Integration Testing is a level of software testing where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and test stubs are used to assist in Integration Testing.

During development, I integrated every unit or module when it was finished and tested it it can be integrated with the others. After I finished the project, I integrated all component and test them manually by doing a full flow of the application. Basically, Integration testing was done after unit testing, and it revealed that every case scenario works properly and fits the description provided in the Use Case Models document.

# Future improvements

# Bibliography