Project Horizon

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1. Introduction

For this project we will be using Openstreetmap API as well as Vipunen API. The main idea of this project is to allow the user to easily see the points needed to enter a college or a high school. The user can filter their wanted fields of study and see from the map where the field is taught in. The user can also give their maximum number of points or use the software calculator that calculates the points and relevant subject scores from their matriculation examination to the map filtering system. The marker popup for the selected college or high school will include overall a variety of useful information that also includes a simplifying rating system that will be based on our algorithm. The algorithm will at least look into the number of students to the staff, the overall success in the research department but also the financial situation of the college.

The marker popup will also include the possibility to see the history and the progression of the points needed to enter the school institute.

The tech stack for this project is the following:
Backend: Java with Spring Boot

Frontend: React with Vite

2. API usage

Like we previously mentioned, our project will utilize two distinct API's: OpenStreetMap and Vipunen API. One is very famous for its free-to-use API implementation and the other one is distinctly Finnish it allows us to utilize Finnish school data to incorporate varies of Finnish Department of Education –data for our usages.

OpenStreetMap will allow us to use the Vipunen's provided school data to get more general information of the school; that includes the contact information and the school website but also the coordinates for the school to plot to the map.

3. Interfaces and general design

The map page works as an interface, the given data will affect the available filter options which correspondingly affect the markers on the map. That means that we will use at least the component design patterns like composite since it allows us to utilize the component-based GUI design. This can also be seen to utilize the factory design pattern, our MapComponent will act sort of as an interface and the given data will complete it.

The information which dataset will be used, is driven by user choice. The user can choose from two options at the landing page: high schools or universities. This option

ultimately decides the dataset, if the user somehow goes to the map screen without a chosen dataset, university dataset will be selected as default. That is a good example, why MVC is such a useful design principle in this project, we need to separate data and view to ensure that filtering and dataset changing is possible with little effort.
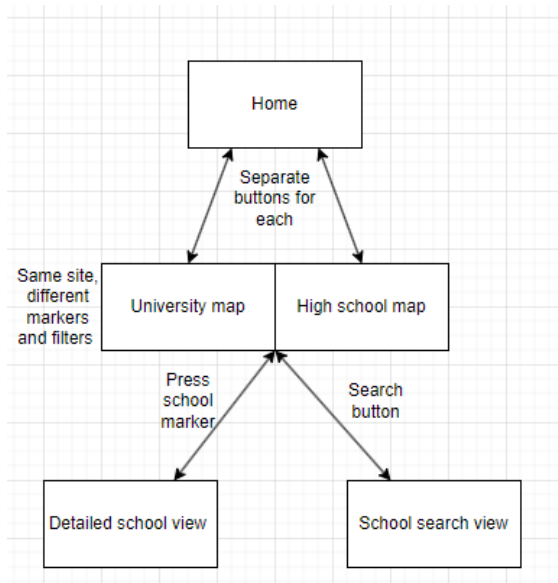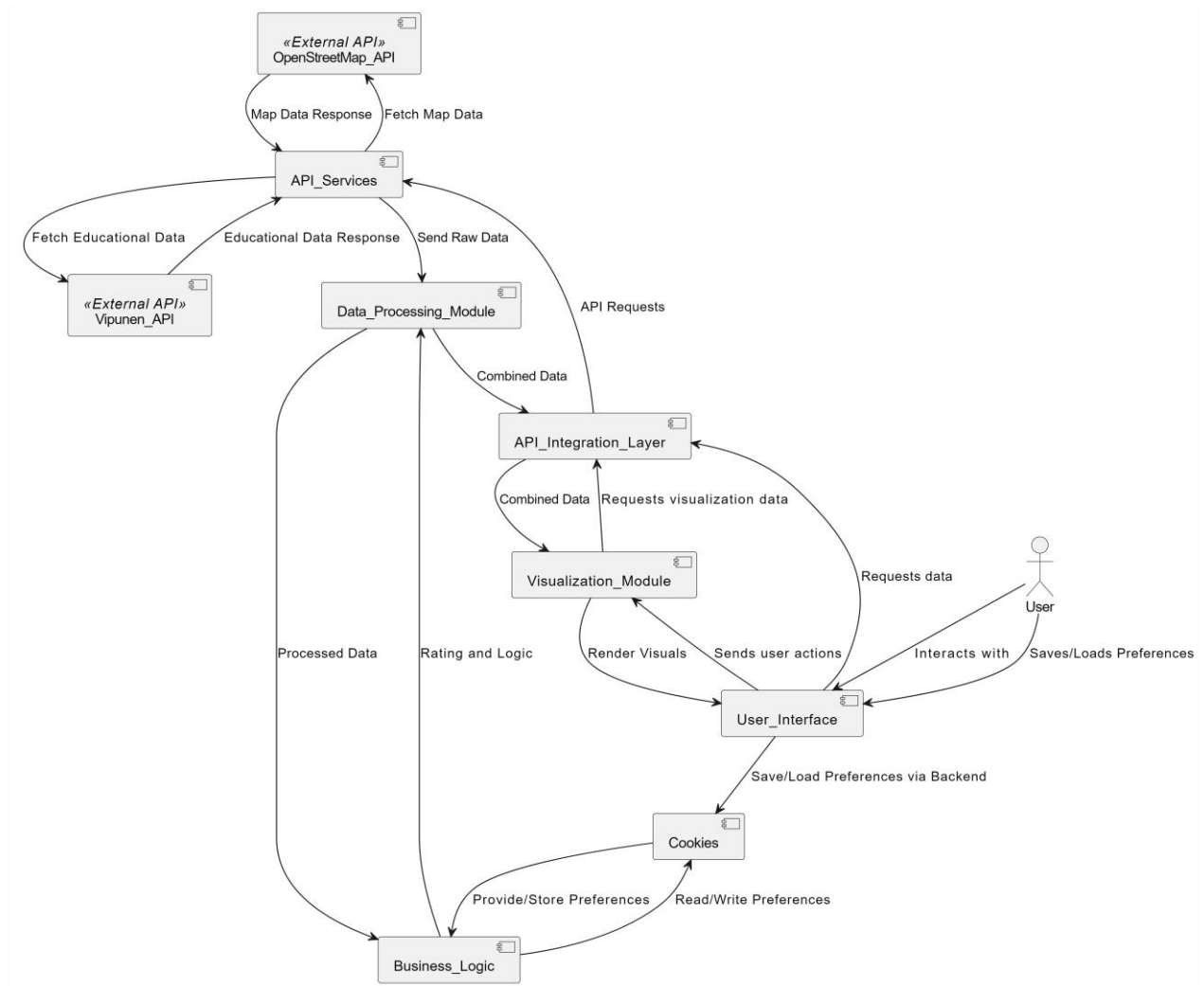

Figure 1: Navigation diagram

Figure 2: High-level design diagram

Figure 2 describes how our program's structure could look like, when all the features have been added.

4. AI USAGE

AI has been used for creating the first version of Figure 2 diagram when given prompt with the specifications of our project, including this document and the given project specification. Figure 2 was then improved "by hand".