## Assignment 1: research, prototyping and decision making

The first assignment is centered around researching frameworks and doing prototyping with these frameworks to find out which one fits your needs. We do that in a structured way which we called the AAD Research Approach, which can be found on Blackboard.

The AAD Research approach describes 3 steps. Please consult the documentation about that method first. We suggest you plan the steps as follows.

Phase 0 (week 1) - Create a structured list of criteria for these three subjects: a) backend frameworks, b) data storage, and c) API standards. Describe all criteria, why these criteria are important to your application and advanced track, and how important they are relative to other criteria. Use references to substantiate this. Also create a list of frameworks/techniques for each of the three subjects.

Phase 1 (week 1) - For each subject, compare at least three frameworks/techniques to do research on. You research should include the generic criteria, but also specific criteria for your own application and your advanced track.

**Examples of ...**

| *Backend frameworks* | *Data storage* | *API standards* |
|---|---|---|
| - Spring Boot (Java) | - Postgres | - REST |
| - ASP.NET Core (C#) | - MS SQL Server | - GraphQL (Facebook) |
| - NodeJS / ExpressJS (Typescript[1]) | - MariaDB | - SPARQL |
| - Django / FastAPI (Python) | - MongoDB | - FALCOR (Netflix) |
| - ... | - RavenDB | - SOAP |
| | - ... | - RPC |
| | | - ... |

Phase 2 (week 2-3) - Narrow your research to two combinations of these techniques. Implement the basics of your backend application with the advanced track in both frameworks. Reflect on the implementation process in your documentation. What went well, what took you way more time than needed? What did you like about the framework, and what held you back?

> *For example: the first prototype could be FastAPI with Postgres and a REST interface, the second prototype NodeJS with MongoDB and a GraphQL interface.*

Phase 3 (end of week 3) - Choose the frameworks and techniques you will proceed with. Draw a final conclusion based on phase 1 and phase 2 and document this in your research paper.

## Submission details for assignment 1

The **minimum requirements** for grading are:

- The research paper contains information about all three phases
- There are two working prototypes
- The prototypes implement the basic application requirements (see below)
- A large part of the prototypes is dedicated to the advanced track research.
- There are no build artifacts (like build output or node_modules) in your submission

The **basic application requirements** are:

- The application uses a database to persist its data
- The application exposes a formal API using an API standard (for example REST)
- There are at least three resources that have CRUD functionality, one of them should have a one-to-many relation with another resource.
- The code is layered and divided into good, reusable components.
- The application contains a tested README to run the app, and that has sample credentials.

On Blackboard you submit the following **artifacts**:

- Your research paper (as pdf)
- Prototype 1 (zipped)
- Prototype 2 (zipped)

The deadlines can be found on Blackboard.

Remember**:**

- The goal is to get used to a certain framework. You are allowed (and encouraged) to use plugins or libraries to speed up the dev process and use the framework standards for storage and security.
- You don't have to create a frontend, but your backend should be fully functional and without (many) bugs. So, make sure you test often and thoroughly.
- By doing the first assignment, you are already well underway for the second. Do take a look at the document about the second assignment.