

IT5100A Course Project – Sem 2 (Jan 2022)

In this course project, we will be using Scala 3 to build an application system and to do so in a largely functional style. You are to undertake this project in either groups of 2 or 3 students. To help you form suitable groups for this course project, we have prepared an Excel worksheet which you can access at the following location to help you look for group members

<https://docs.google.com/spreadsheets/d/1b7rO893REjRXmd-ZzAN5tyjdAdDcJWPv/edit?usp=sharing&ouid=107348004122694499892&rtpof=true&sd=true>

You are expected to focus on one of the following two aspects for your application system:

- (i) Database backend, or
- (ii) Web front-end

If you are focusing on the database back-end, you should focus on the design of your database system, its queries and reporting. You may consider how you would design a canonical database with minimal redundancy, what sort of queries are to be supported, or how you are to support concurrent and high performance database accesses. You can focus on one or more of these directions, and describe your experience in your project report.

If you are focussing on the web front-end, you could consider how what user-interface are required, client-server models (but focusing on client side), and secure and safe server communications.

Take note that while your application system may embrace both web front-end and database backend; there is no necessity to do so; and you should focus on just one of the above two directions for your application system.

The project will have the following stages and deadlines

1. Specification Stage (2 weeks) 28th January 2022 (10 marks)

For this stage, you are expected to brainstorm on a “small” application system that you wish to develop for this course project. You may want to discuss why such an application system would be useful and what are the expected novel and positive elements of your system. You will conclude this phase by a set of slides (more than 10-slides in PDF format) that provide an description of your application system; highlighting its possible features and usefulness. As we have not restricted you’re your application domain, this is a good chance to work on an initial protytype of your favoured application system. Be realistic with the scope of your application system. A prototype should be sufficient,

2. Design/Exploration Stage (3 weeks) 18th February 2022 (10 marks)

In the design stage, you will be exploring the platform/library (e.g. Play, Scilla etc) that you will be adopting for use to implement your project. You will explore the key features available and look at some sample applications. After that, you would write a 5-page document to introduce the library/platform that you will be using. If you wish, you may write a blog about it. As a deliverable of this phase, you will submit a 5-page document on your design/exploration stage. You can begin your prototyping in this phase but you need not describe your prototype in this report. Your report should just focus on the technology/library/system that you intend to make use of in your application system.

3. Implementation + Final Submission (3 weeks) 4th March 2022 (30 marks)

In the final phase, you are to code your application system in Scala 3. You are also expected to write your implementation in a largely functional style, and to avoid the use of imperative features, where possible. The deliverable of this stage should include the following which you are to submit in a zip file.

- (i) Implementation Code + URL link of your system
- (ii) A 10-page report that highlights your experiences in building the application system in Scala 3 and the associated library/platform
- (iii) A 5-mins video presentation on your application system.

While you are free to choose any application system, let me list some example application systems that you may consider.

- (i) Univ/School application and evaluation system (*I can give further spec and sample/anonymized data if anyone is interested in this particular application system based on graduate division requirements*)
- (ii) HR job application system
- (iii) An customer ad-hoc chat system
- (iv) ...

References for Possible Scala DB Libraries

<https://scala-slick.org/>

<https://www.baeldung.com/scala/play-database-access>

<https://www.lihaoyi.com/post/WorkingwithDatabasesusingScalaandQuill.html>

References for Possible Scala Web Frameworks

<https://nordicapis.com/8-frameworks-to-build-a-web-api-in-scala/>

<https://gist.github.com/sroebuck/781320/a8be1b0c1574ce5da264b358b1e8f9921e0719be>

<https://www.playframework.com/>

<https://scalatra.org/>

<https://glossarytech.com/terms/scala>