VTTP 2025 Batch 5 Mini Project

Name	
Email	

Date: Monday Feb 17 - Mar 27 2025

In this final project, you are to design and develop an application of your choice using what you have learned from this course.

The project duration starts from Feb 17 to Mar 27; **Mar 27 is the presentation day**.

Your application should consist of a minimum of 2 logical parts:
- Frontend - Angular
- Backend - Spring Boot

Your application must use technologies listed under Mandatory and Optional below.

The mini project will be graded according to the 4 categories:
- Application (50 marks) - How well thought out is your application, how you have implemented the application features, and creativity. Think of this criteria as trying to sell your application to a VC (venture capitalist) to get money
- Aesthetics (20 marks) - Look and feel of the application
- Mandatory requirements (10 marks) - fulfilling the mandatory requirements
- Optional requirements (20 marks) - fulfilling the optional technical requirements

Mandatory

You must use **all** of the following requirements in your application.

Mark a cross X on the box beside each item to indicated that you have fulfilled the mandatory criteria

Angular	
Forms (either reactive or template-driven)	
Use GET, POST, PUT, DELETE (3 or more) to communicate between frontend and backend	
Single Page Application (client side routing) with a minimum of 4 views	
Abstract common functionalities into Services	
Use Component Store for client side application state management	
Include an application manifest	
Spring Boot	
Use of POST to handle either x-www-form-urlencoded and/or JSON and/or multipart payload	
Making HTTP request to external RESTful API	
Parameterized routes	
Query string	
Must support more than 1 user	
Database	
Must use MySQL	
Modeling data relationship: 1 to 1, 1 to many	
Demonstrate data integrity and consistency when updating multiple tables	

Must use a different second database eg: Mongo or Redis	
Deployment	
Containerized your Angular and Spring Boot application	
The application that you have developed must be publicly accessible. You can deploy your application either as 2 separate deployments, frontend and backend or as a single deployment where the frontend is served from the backend. Applications can be deployed to Railway or any equivalent cloud PaaS platform like Heroku, AppEngine, etc If Angular is deployed separately, they can be deployed to static web hosting sites or JAM platforms like Vercel, Cloudflare or serving it from your hosted web server. Note: you cannot use Github pages for hosting your application	
All databases must be deployed to the 'cloud'. They can be deployed as VMs in public cloud or using managed database services	

Optional

Your application should accumulate a minimum of **25 points** from the lists of optional features. These 25 points is not the marks of your project but rather a gauge of how many optional requirements you have implemented in your project. So your project must have a minimum of 25 points worth of optional requirements.

Mark an X on the selection options.

Backend Optional Requirements	
Use web sockets (8pts) in Angular and Spring Boot	
Integrate with any API that requires OAuth2 authentication	

Backend Optional Requirements	
(4pts)	
Integrate with Google calendar or Drive (6pts)	
Bots eg Telegram, Slack, (6pts)	
Firebase web notification with frontend web notification (10pts)	
Include simple AI into your application. Must be model based (not a series of if/then/else) or use 3rd party AI service (5pts)	
Use another NoSQL database not taught in the course: eg. graph, vector, timeseries, etc (6pts). If you are implementing this option, then you can ignore the mandatory second database requirement.	
Sending email (3pts)	
Use Spring Boot security with JWT to authenticate and authorize Angular request (4pts)	
Integrate with Ethereum's smart contract. You must also write the smart contract with Solidity (12pts)	
Ingesting and processing messages from a 'real' queue eg. Kafka, RabbitMQ, etc not Redis. Message brokers must be running in the Cloud (6pts).	
Integrating with payment gateways, eg. Visa, Stripe, etc (6pts)	
Add application metrics into your Spring Boot application. The metrics should be viewable from Prometheus. You should implement a minimum of 3 metrics (6pts)	
Integrate your project with another member's project in the cohort; eg. your application is an e-commerce store front; the other application is warehouse management. Integration must include the following: - Both applications must communicate with each other - Integrate with the core functionality of the application Your application can integrate with more than one project in the cohort. +1 for each application that you integrate with up to a maximum of 7 points. (5 - 7pts).	

Backend Optional Requirements	
Official name(s) person's application you are integrating with 1. 2. 3. 4.	

Frontend Optional Requirements	
Use any Javascript/Typescript game framework eg. Phaser3, LittleJS, Kaboom, etc. (6pts)	
Bundle Angular application as iOS or Android application with hybrid app tools like Capacitor, Cordova, NativeScript (8pts)	
Use map eg Google Map, must be dynamic (4pts)	
Use a UI component framework - eg. ng-bootstrap, Material, PrimeNG (3pts)	
Use state management libraries like Akita, NgRx, NGSX, etc (6pts). If select this requirement, then you can ignore the mandatory Component Store requirement	
Adding a service worker to precache application assets (4pts)	

Deployment Optional Requirements	
Containerize your application and deploy into a Kubernetes cluster. Your application should be exposed with an Ingress resource (8pts).	
Apply a domain name and configure your application to use the domain name (2pts)	
Use Github actions for continuous build and continuous deployment to automatically build and deploy your application (6pts)	

If you have ideas or requirements that are not on the above list, please discuss with the instructors before using it in your application. The instructor will assign a point to your requirements. You cannot assign points to your own requirements.

Description of your requirements	Pts

Presentation

You will be presenting your application on the days from **Wed Mar 26 2026**. A presentation schedule will be sent closer to the date. The presentation is to be conducted in person and not over Zoom. You will have 10 minutes to show off your application. You only have 1 opportunity to present. There will be no makeup if you miss the presentation.

You will be presenting the application on a provided computer; your project must be deployed before your presentation. You cannot present your project running on your notebook.

Submission

You must submit your assessment by pushing it to your repository at either GitHub, GitLab or BitBucket.

Only commits before **0900 Mar 27 2025** will be accepted. Any commits after **0900 Mar 27 2025** will not be accepted. No other form of submission will be accepted (eg. ZIP file).

Fill up the form and put a cross on all the mandatory requirements and optional requirements that you have used.

Generate a PDF copy of this mini project document and rename it to your official name (as in your NRIC) and email it to isslcm@nus.edu.sg. **This document must reach the above email no later than Wed 0900 Mar 26 2025 for your project to be graded**. No marks will be awarded for your project if I do not receive this document by **Wed 0900 Mar 26 2025**.

You cannot change your project requirement (this document) after **Wed 0900 Mar 26 2025**.

Remember to generate a PDF of this document and rename the PDF file to your official name (as in your NRIC). Otherwise, your submission will not be accepted.

Academic Integrity

The assessment must be your own work. You cannot ask a third party to write any part of this assessment or use AI tools such as ChatGPT to generate output and submit it as part of your assessment. This will result in an automatic disqualification from the assessment.

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