VTTP 2022 Batch 2 Final Project

Name	**Gay Horng Tze James**
Email	**jamesgayht@gmail.com**

Date: Monday Feb 27 - Apr 26 2023

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

The assessment duration starts from February 27 to April 26 and will consist of 2 parts

- Feb 27 to Apr 21 2023 - work on your application
- Apr 24 - 26 - present your application

Your application will be assessed on the following

- Design and implementation
- Use of technologies to address issues
- Aesthetics and usability
- Creativity

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.

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	
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 another database type eg. key/value, blob, graph, document	

Deployment	
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 **20 points** from the lists below.

Mark a X on the selection options.

Backend Optional Requirements	
Use web sockets (8pts)	
Integrate with any API that requires OAuth2 authentication (6pts)	
Integrate with Google calendar or Drive (6pts)	

Backend Optional Requirements	
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)	
Using a graph databases (6pts)	
Sending email (5pts)	
Use Spring Boot security with JWT to authenticate and authorize Angular request (5pts)	
Integrate with Ethereum's smart contract. You must also write the smart contract with Solidity (12pts)	
Ingesting and processing messages from a queue eg. Kafka, Rabbit, etc (6pts)	
Integrating with payment gateway (8pts)	

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 (4pts)	
Use a UI component framework - eg. ng-bootstrap, Material, PrimeNG (4pts)	X
Use state management libraries like Akita, NgRx, NGSX, etc (6pts)	
Adding a service worker to precache application assets (4pts)	

Deployment Optional Requirements	
On a server (virtual machine) running on any public cloud. (4pts)	
Containerize your application and deploy into a Kubernetes cluster (10pts)	X
Containerized your Angular and Spring Boot application (3pts)	X
Apply a domain name and configure your application to use the domain name (3pts)	X
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

Description of your requirements	Pts

Presentation

You will be presenting your application on the days from **Apr 24 - 26 2023**. A schedule will be sent later in the year. You will have 10 mins to show off your application. You will be presenting the application on the provided computer or on your mobile phone. You only have 1 opportunity to present.

The order of presentation will be published by and 'live' by before your presentation. Your project cannot be running locally 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 Wednesday April 26 2023** will be accepted. Any commits after **0900 Wednesday April 26 2023** will not be accepted. No other form of submission will be accepted (eg. ZIP file).

After you have committed your work, post the following information to Slack channel `#miniproject-02`

1. Your name (as in your NRIC)
2. Your email
3. Your batch 2a or 2b
4. One or more of the deployed application's URL, bot name etc. Your application must be 'live' before your turn to present
5. Git repository URL

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. The document should be sent **no later than Friday Mar 17 2023**. This document will be used as a guide to grade your project.

Any project document submitted **after Fri Mar 17 2023 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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