F-Code Back-End 3 Final Project

No code no gain!

# **Introduction**

In this final project, you will build a web application with MVC Pattern from scratch. The project must meet the criteria described below in order to pass the level:

* The application MUST be written in Java Programming Language (should be JDK 1.8).
* Your application should be compatible with Apache Tomcat 8.5.7.
* The application MUST be organized based on MVC1 or MVC2 design patterns.
* The application MUST have one of the topics listed at the *Topics* section.
* Your submission MUST include: your project’s documentation (project description, requirement, Database ERD) and your whole project folder.
* You CANNOT use Java libraries other than Java EE, Java SE, JDBC libraries and JWT.
* Your project MUST be equal or greater than 5 points to pass. These are the criteria:

| **#** | **Criteria Group** | **Criteria** | **Grade** |
| --- | --- | --- | --- |
| 1 | UI/UX | Good-looking UI | 0.5 point |
| 2 | Good UX | 0.5 point |
| 3 | Database | Number of tables | > 5 tables: 0.5 point  > 7 tables: 1 point |
| 4 | Normal Form | 1NF: 0.5 point  2NF: 0.75 point  3NF: 1 point |
| 5 | Data type variation (use reasonable data type for attributes) | 0.25 point |
| 6 | Using SQL Functions/triggers | 0.25 point |
| 7 | Application | Good performance (low complexity, optimizing SQL statements) | 0 to 1 point |
| 8 | Auth checking (some paths required authentication/authorization) | 1 point |
| 9 | Your understanding of your code | 0 to 2.5 point (presentation) |
| 10 | Clean code & code documentation | 1 point |
| 11 | Deployment | Deploy your application & database | 1 point |

# **Topics**

You can choose one of the following topics to build your project:

### **Food Supply Chain**

Logistics always plays a critical role in any aspect of our lives. Supreme Logics Co is one of the biggest and wealthiest companies in the world which holds a 30% of global food supply chain. However, they are facing a big problem. For many years, they have been managing their business with paper and with the explosion of the world economy in recent years, paper is no longer suitable for such fast-growing events. They quickly realize that and pay money to hire many IT experts to help them solve the problem. You are one of the experts who are required to achieve the best solutions:

* You will make a web application for Supreme Logics Co to manage their food supply chain.
* The company has to manage food supply chains for many regions such as Asia-Pacific, North America, South America, Southeast Asia, etc.
* In every region has it own industrial and agricultural status (name: text, level: high/low/medium, value: % decimal, potential: integer 1-10, development: integer 1-10), population (distribution: decimal, migration: integer 1-10, urbanization: integer 1-10) and nature status (agriculture land: % decimal, forest land: % decimal, disaster: can be many value like earthquake, typhoon, tsunami, etc.)
* Supreme Logics Co acts like a middle man to buy food from manufacturing companies and distribute/sell to needed companies, thus, they also want to manage their client companies. Each company should have its legal name, tax code, region, the industry/agriculture which it participates in.
* Your web application should be able to manage all the information above with ease (contains high user-supporting features like search, filter, account for admin and clients, etc.)

### **The Roman Empire**

The Roman Empire was established in 27 BC under imperator Augustus Octavian after winning the civil war of the collapsed republic. Emperor Augustus saw the Roman people with many years of conquest but lack of civil development had decided to do as many reforms as he could. He started with market reform. He divided his realm into many sections such as Italia, Gaul, Britannia, Africa, Asia Minor, etc. and introduced taxes. Each region should have a consul who rules the region, writes reports as well as pays tribute to the empire. You are Augustus’s slave, he required you to develop a web application to manage the nation's budget, consuls and regions. Some of the requirements are listed below:

* Each region has many small tribes and kingdoms (versailles), name, market value (big decimal), growth (% decimal), revolt rate (% decimal), food supply (1-10 integer).
* Each consul has his name, age, address, number of terms (4 years per term), salary, noble (yes/no).
* The emperor can request the consul for a report from the region. The report should include the prediction of all the information of the region within a period of time in the future (months or years) and some more information like written date, delivered date, location, etc.
* Your application should support the emperor in managing his officers as well as provide the officers with reliable tools for self-managing and report management (create report, report history, reply of the emperor, etc.)

### **Mysteries Of The Universe**

Since the founding of human civilization, people have been curious about the sky, the magical world beyond reach. Though most humans hide that desire inside of them, some others want to seek for the truth. They are formed into groups, multiple groups form an organization, all together they form the whole community of ambitious and mysterious philosophists or astronomists. The community has been existing for more than 2000 years. In 2023, they want to further expand their network by making their own social media called *Mystery Book*. The app should meet the following requirements:

* Anyone who wants to join the community has to create an account with some personal information like name, email, phone number, date of birth, etc. He/She can adjust that information as well as provides more information about his/her interests, bio, etc.
* He/She can make friends, make a group, or join other groups.
* He/She can share his/her opinions under many forms:
  + Private message with a friend/group
  + Post on his/her personal page (can choose who can see)
  + Post on groups (Group’s owner can choose whether members can post as they desire or require an approval)
* He/She can vote and express their opinion about a post. He/she can add a post into his/her favorite posts section.
* He/She may receive notification when:
  + Other users make a friend request/accept a friend request
  + A user commented/voted hist/her post
  + … (brainstorming yourself)

Note for this topic: The message and notification features are not necessary real-time.

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