



Battleships Application

Exam Preparation [Spring Fundamentals]

The video game market is quite oversaturated but there is always room for another clone of one of the most famous game series. A group of friends decided to try to develop this game, but they need your help to implement it. The idea is clear but due to the lack of technical knowledge from your colleagues you will have to create the business logic for this project.

1. Database Requirements

The **Database** of the Battleships application needs to support **3 entities**:

User

- **Id** – Accepts **UUID-String** or **Long** values
- **Username**
 - The **length** of the **values** should be **between 4 and 10** characters long (both numbers are **INCLUSIVE**)
 - The values should be **unique** in the database
- **Full Name**
 - The **length** of the **values** should be **between 5 and 20** characters long (both numbers are **INCLUSIVE**)
- **Password**
 - The **length** of the **values** should be more than **3** characters long (**INCLUSIVE**)
- **Email**
 - The values should contain a '@' symbol)
 - The values should be **unique** in the database

Ship

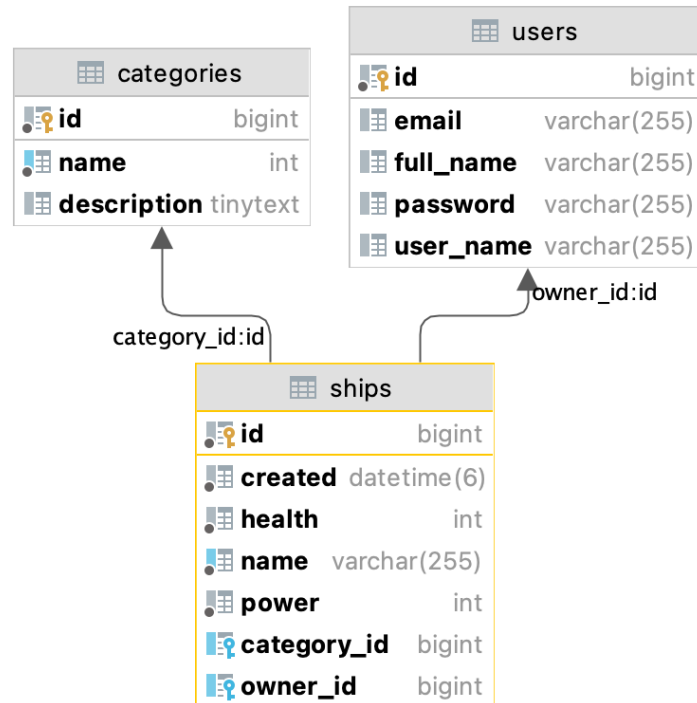
- **Id** – Accepts **UUID-String** or **Long** values
- **Name**
 - The **length** of the **values** should be **between 2 and 10** characters long (both numbers are **INCLUSIVE**)
 - The values should be **unique** in the database
- **Health**
 - The **values** should be **positive numbers**
- **Power**
 - The **values** should be **positive numbers**
- **Created**
 - The **values** should **not** be **future dates**
- **Category**
 - A **relationship** with the **Categories Entity**
- **User**
 - A user that **owns the ship**

Category

- **Id** – Accepts **UUID-String** or **Long** values
- **Name**
 - An option between **BATTLE**, **CARGO** and **PATROL**
 - The values should be **unique** in the database
- **Description**

- A very long and detailed description of the category
- Can accept **null values**

Nullable/Empty/Blank values are not allowed unless explicitly mentioned. Implement the entities with the **correct data types** and implement the **repositories** for them. Here is the ER Diagram.

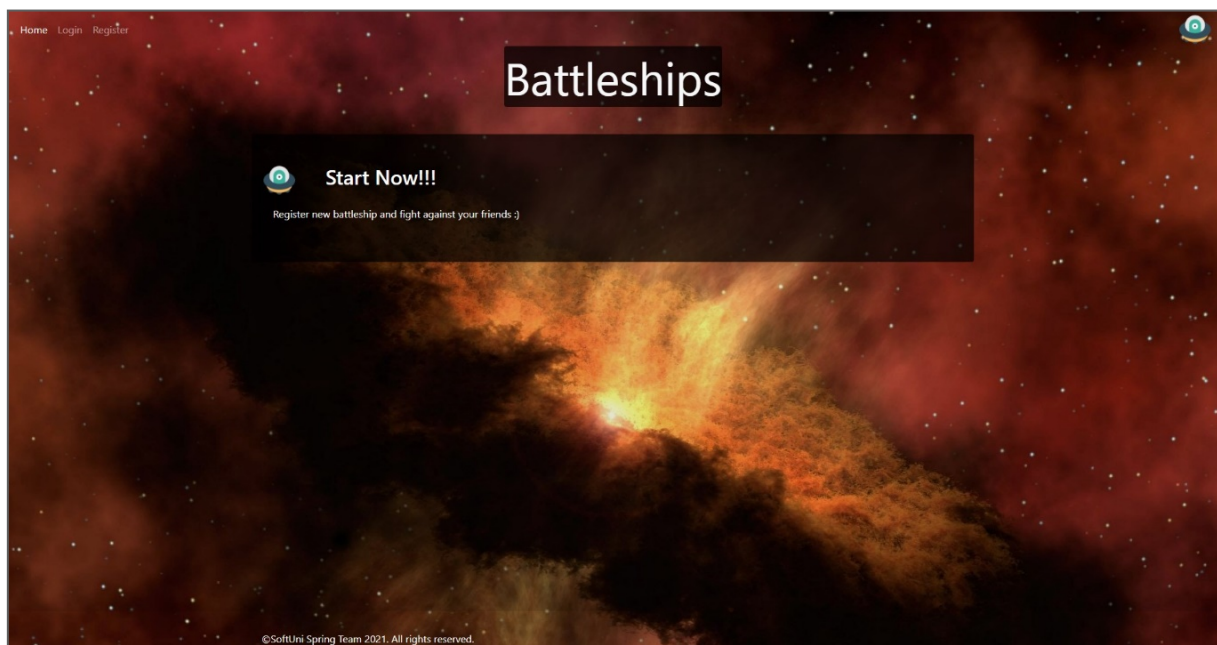


2. Initialize categories

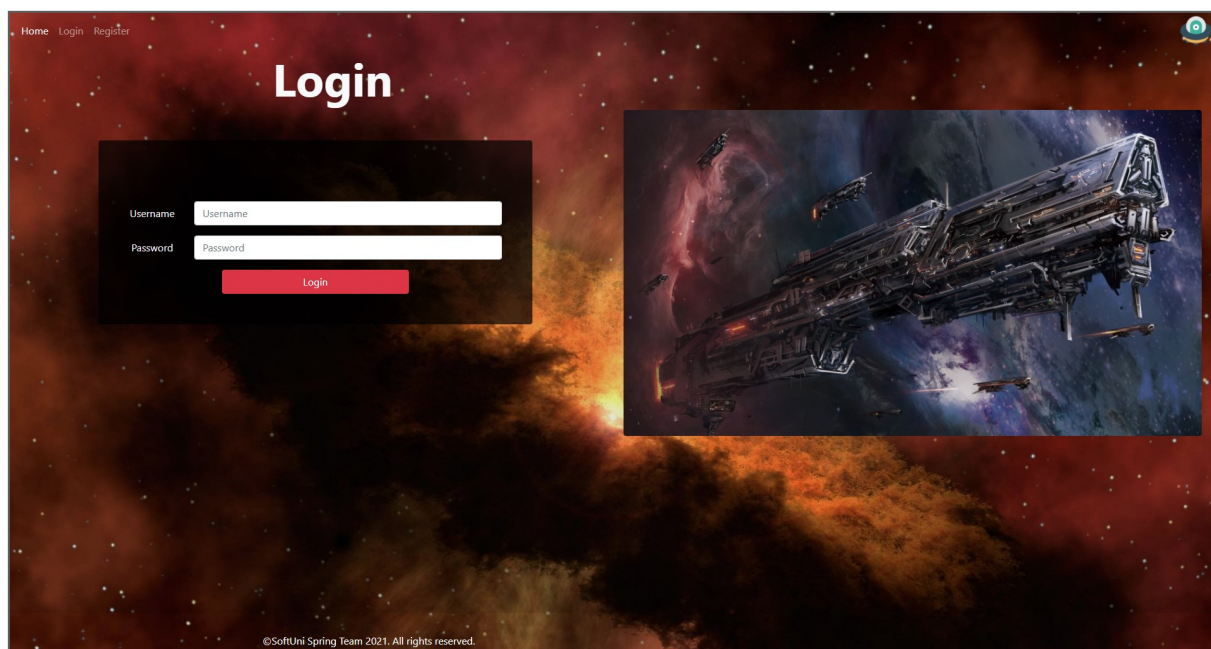
- Implement a method that checks (when app started) if the database does not have any category and initialize them
 - You are free to do this in some different ways
 - You can skip the description if you want

3. Page Requirements

Index Page (logged out user)



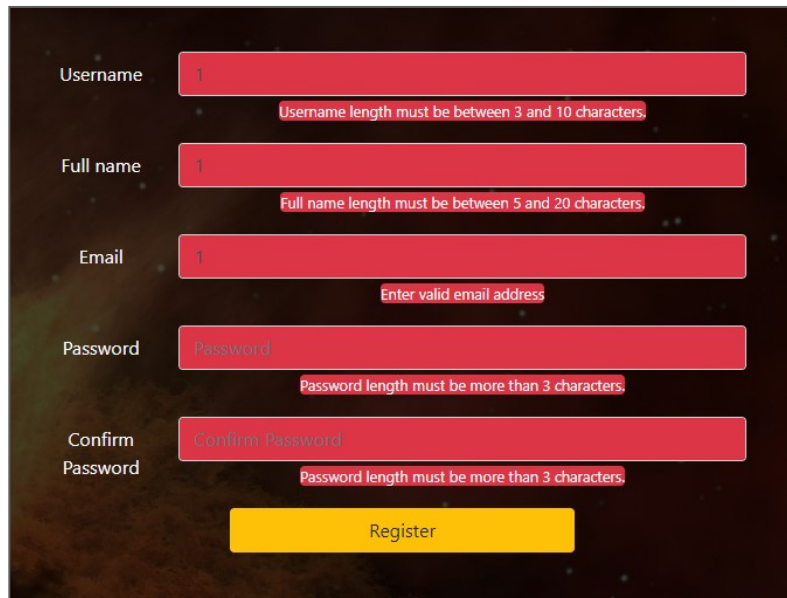
Login Page (logged out user)



Login Page validations

This screenshot shows the login form with validation errors. The 'Username' field contains the character '1', and a red error message below it states 'Username length must be between 3 and 10 characters.' The 'Password' field contains the text 'Password', and a red error message below it states 'Password length must be more than 3 characters.' The 'Login' button is still visible at the bottom.This screenshot shows the login form with a general validation error message. The text 'Enter valid username and password' is displayed in red above the input fields. The 'Username' field contains the text 'дасдадад' and the 'Password' field contains the text 'Password'. The 'Login' button is at the bottom.

Registration Page (logged out user) / Registration Page validations



The registration form is displayed on a dark background with a starry space theme. It includes five input fields: Username, Full name, Email, Password, and Confirm Password. Each field has a red validation message below it. The Username field has a message "Username length must be between 3 and 10 characters." The Full name field has a message "Full name length must be between 5 and 20 characters." The Email field has a message "Enter valid email address." The Password field has a message "Password length must be more than 3 characters." The Confirm Password field has a message "Password length must be more than 3 characters." A yellow "Register" button is located at the bottom of the form.

Username 1
Username length must be between 3 and 10 characters.

Full name 1
Full name length must be between 5 and 20 characters.

Email 1
Enter valid email address

Password Password
Password length must be more than 3 characters.

Confirm Password Confirm Password
Password length must be more than 3 characters.

Register

Navigation (Guest user)

- Note: can access only **Index**, **Login**, **Registration** pages.

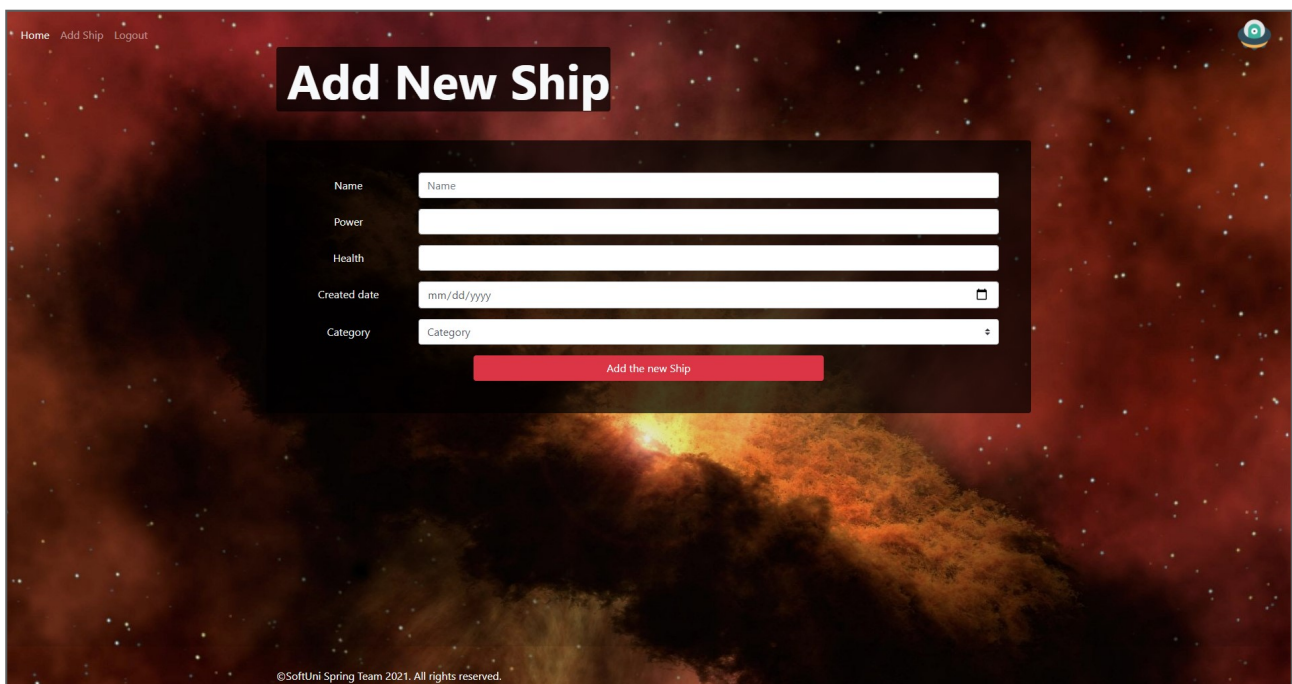


Navigation (Registered user)

- Note: can access only **Home**, **Add Ship**, **Logout** pages.



Add Ship



The "Add New Ship" form is displayed on a dark background with a starry space theme. It features a title "Add New Ship" in a large, bold, white font. Below the title is a form with five input fields: Name, Power, Health, Created date, and Category. The "Created date" field has a date picker icon. A red "Add the new Ship" button is located at the bottom of the form. The background of the page is a dark red space scene with a bright orange and yellow nebula.

Home Add Ship Logout

Add New Ship

Name Name

Power

Health

Created date mm/dd/yyyy

Category Category

Add the new Ship

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Add Ship validation

The screenshot shows a form titled 'Add Ship' with the following fields and errors:

- Name:** Input field contains '1'. Error: 'The name must be between 2 and 10 characters.'
- Power:** Input field contains '-1'. Error: 'The power must be positive.'
- Health:** Input field contains '-1'. Error: 'The health must be positive.'
- Created date:** Input field contains '06/14/2025'. Error: 'Created date cannot be in the future.'
- Category:** Dropdown menu shows 'Category'. Error: 'You must select the category.'

At the bottom of the form is a button labeled 'Add the new Ship'.

Home Page

The screenshot shows the 'Battle' page with the following elements:

- Navigation:** Home, Add Ship, Logout.
- Attacker Section:** 'Select the attacker' with a dropdown menu labeled 'Select one of the ships that are owned by the current user'.
- Defender Section:** 'Select the defender' with a dropdown menu labeled 'Select one of the ships that are owned by other users'.
- Fire Button:** A red button labeled 'FIRE !!!'.
- Status Table:** A table titled 'The All Ships And Their Status' with columns 'Name -- Health -- Power'. The first row shows 'ship1 -- 10 -- 10'.

NOTES:

- You must select **one** of the ships that are **owned** by the **current user**
- You must select **one** of the ships that are **owned** by **other users**
- In the last section you should list all the ships **ordered by** their status (name, health, power) in the following format: "| **name** | **health** | **power** |"
- When pressing the fire button, the **attacker hits** the defender and **reduces** his health by the value of the attacker's power. The **defender also hits** the attacker and **reduces** the attacker's health by the value of defender's power. If the defender's or the attacker's healths are **less than or equal to 0**, **remove** their ship from the database. After the attack, the application must redirect again to the home page.

The templates have been given to you in the application skeleton, so make sure you implement the pages correctly.

- The templates should look **EXACTLY** as shown above.

- The templates do **NOT require additional CSS** for you to write. Only the provided **bootstrap** and **CSS** are enough.

4. Functional Requirements

- The Functionality Requirements describe the functionality that the **application** must support.
- The **application** should provide **Guest** (not logged in) users with the functionality **login**, **register** and view the **Index** page.
- The **application** should provide **Authenticated** (logged in) users with the functionality to **logout**, **add a ship**, view **home** page and ready to **attack** other ships.
- In the **Battleships Application**, the navigation bar should redirect to the appropriate URL depending on if the user is logged in.
- The **application** should provide the **functionality** for **adding ships** with **categories** and **users**. Also, the ships should **fire** at other ships and **remove** them from the database when their health is **lower than or equal** to 0.
- The **Attack** button **creates** the **attack** to the defender and **redirects** to the home page.
- The **application** should **store** its **data** into a **MySQL** database.

5. Security Requirements

The Security Requirements are mainly access requirements. Configurations about which users can access specific functionalities and pages.

- **Guest** (not logged in) users can access:
 - **Index** page;
 - **Login** page;
 - **Register** page.
- **Users** (logged in) can access:
 - **Home** page;
 - **Add Ship** page;
 - **Logout** functionality.