Nurse Rostering (Spring Boot) User Guide

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1.0 System Overview

This Spring Boot version NurseRoastering is the hardcore coding implementation based on what we learnt in school (OptaPlanner） and what we use in work to build real world business systems(Spring Boot).

Resource constraints issues in Singapore hospitals have long been an challenge due to the increasing number of patients and shortage of nurses.

OptaPlanner has provided a sound solution to this type of resource constraints problems as standalone application, while with the current trend of micro-service based system design, it has been the industry practice that build solutions as services where it can be run as independent application, or be part of a bigger systems.

Considering the above, the solution has been architectured such that OptaPlanner as a plugin of SpringBoot framework, which can be easily extended with other features as plugins in future.

1.1 User Interface

The front-end system is built with simple HTML page and javascript, which calls the REST API from the backend.

2.0 Requirements

2.1 Recommended Browsers

- Google Chrome
- Microsoft Edge

3.0 Deployment

Our system is capable of running on both Windows or Linux Systems as .jar executable.

3.1 Prepare and run NurseRoaster (Spring Boot) - **Yoke to help**

1. Mvn build command
2. Execute with java -jar NurseRoastering.jar

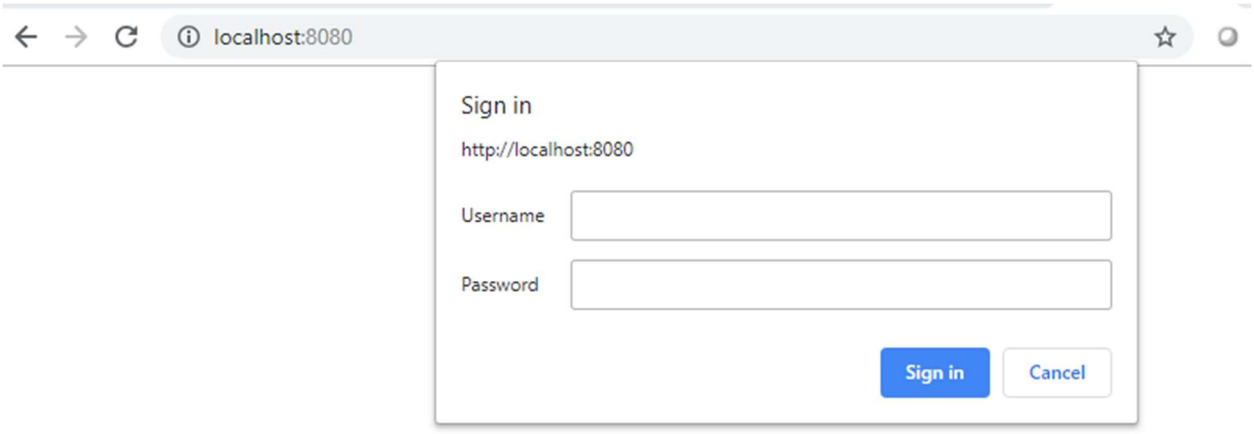
3.2 Setup the Nurse Rostering Web project in IntelliJ **Yoke to help**

1. Download source code from URL: https://github.com/guofeng201507/IRS-RS-2019-03-09-IS1PT-GRP-ai.Orz-NurseRosteringSpringBoot.git
2.
3.

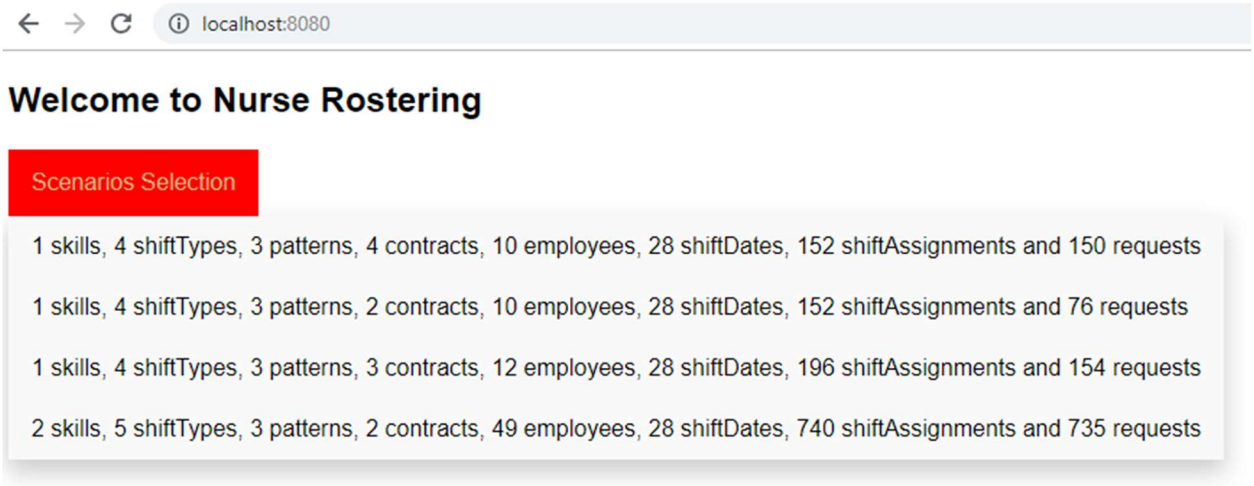
4.0 Walkthrough

After the application is started. Open: http://localhost:8080

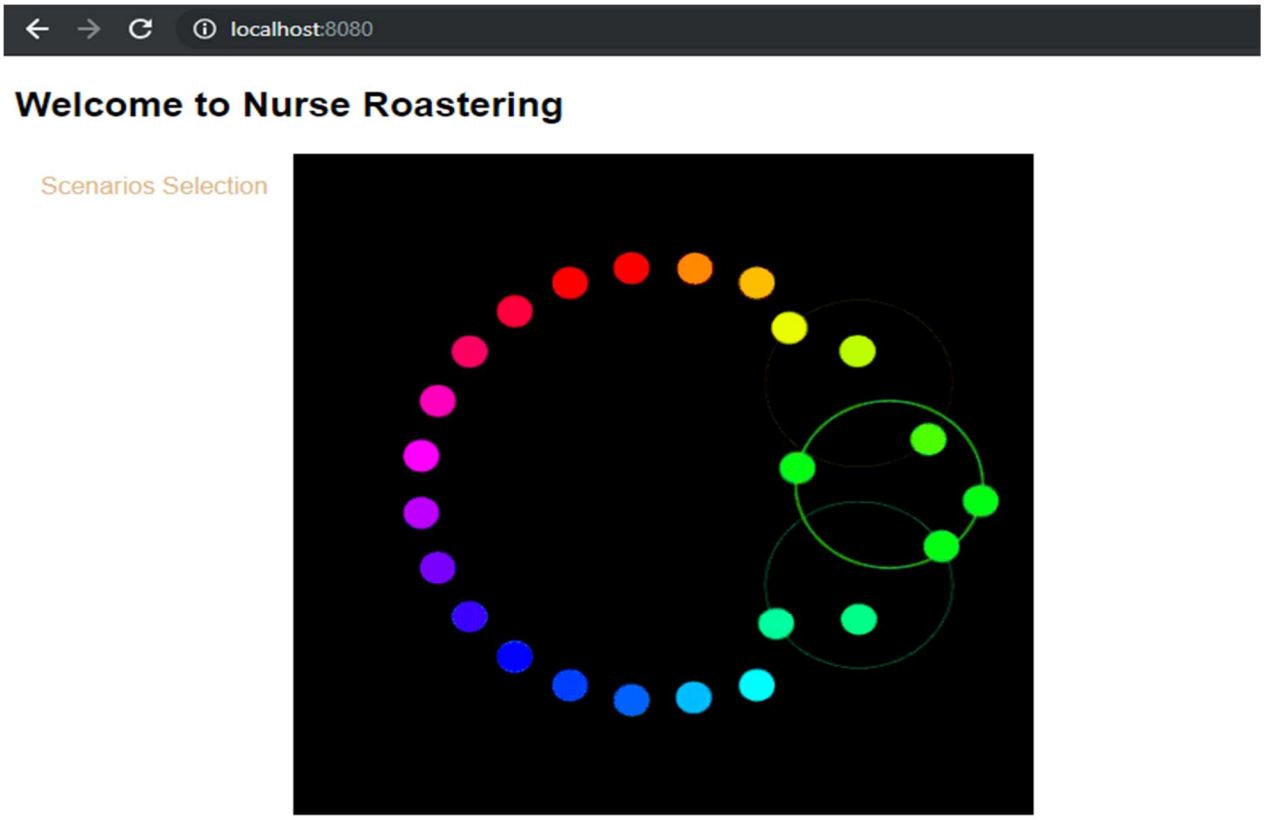
Enter the username/password as: **john/john@pwd1**



It will bring you the home screen, where use can choose the test scenarios, they are pre-configured according to the business scenarios.



Choose any of the scenarios and click, the optaplanner will start computing.



After 20 seconds computing time, the roastering table will be presented.

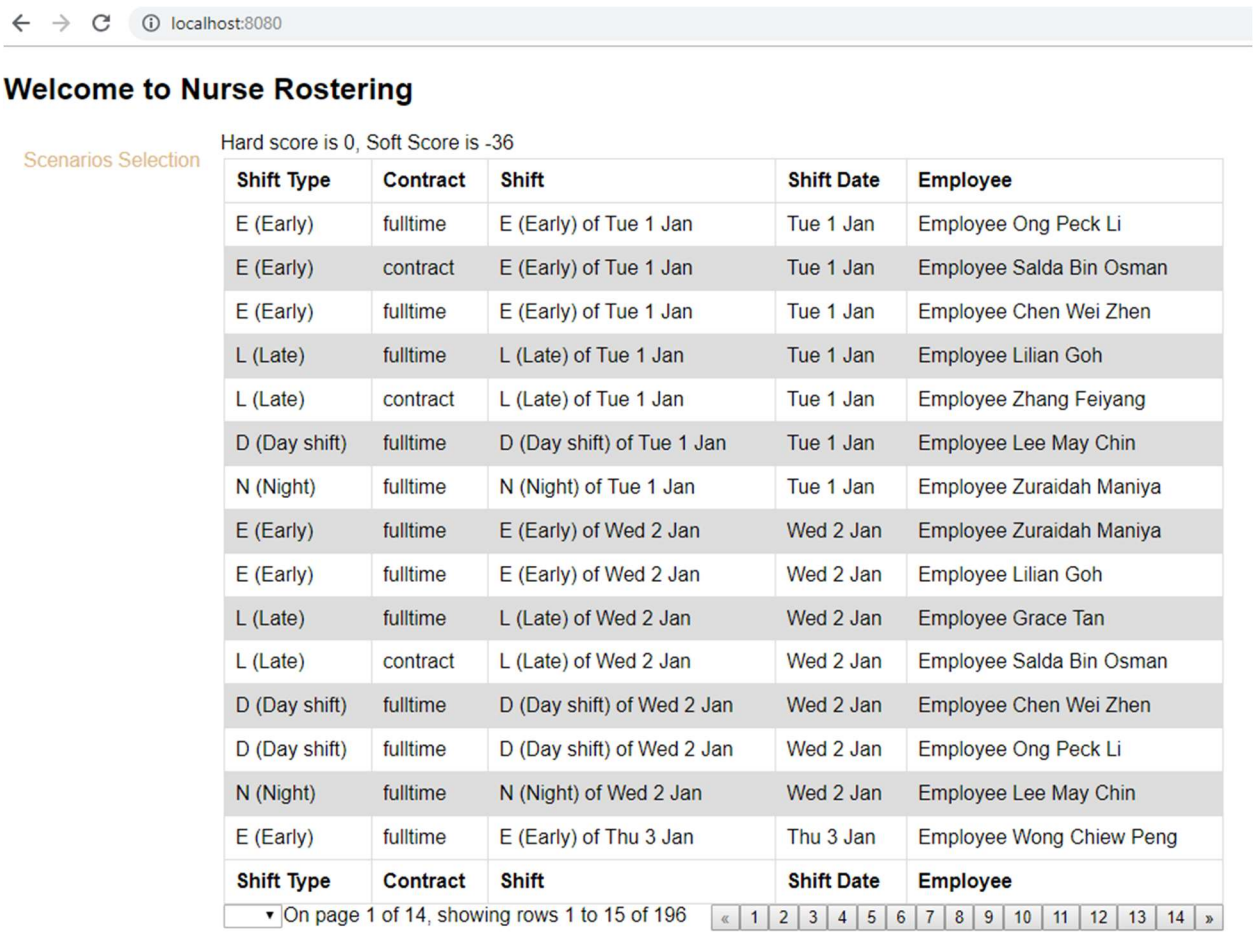
Note:

1. You will hear a loud cooling fan noise when the optimization process starts, this is because we have set the optaplanner to run with the server's highest CPU throughput (Leveraging all computing cores with highest clocking speed), this is to speed up the process, as web users generally do not have patience to wait long time.

   In nurseRosteringSolverConfig.xml
   `<moveThreadCount>AUTO</moveThreadCount>`

2. Termination condition is set as 20 seconds, as we have tested and found out that 20s is **sufficient** for optaplanner to compute the optimum result.
   `<secondsSpentLimit>20</secondsSpentLimit>`

After the waiting time, the result table will be shown.



Explanation:

1. On top of the table, it shows the hard score and softscore.

2. The table contains the roastering plan, it shows on which day, which shift, who is assigned, and whether the employee is full time or contract.