Deloitte - Online TODO List Application

# Project Description

Build an Online TODO List with a web interface that is cross-browser compatible.

The application supports registration of multiple users to create and track their tasks.

All the data is stored in the H2 database which is an in-memory database.

# Features

* New users can register using their first name, last name, email and password.
* Registered users can sign in using unique login and password securely
* Logged in Users can
  + view her/his task list
  + add new task
  + remove task
  + check/uncheck any task on their list to take it to completion
* All changes are persistent to allow to view them in next sign in by the same user
* Each task would display the date of creation, last update and description.

# Design and Approach

* Backend for this application is built using **Java 1.8 , Spring Boot and REST APIs**. Spring Boot was chosen as it helps to create a stand-alone application with less configuration and avoid writing a lot of boilerplate code.
* Login, Registration and Authentication modules were developed using **Spring Security**.
* A functional front-end was developed using **HTML, Javascript**.
* **Thymeleaf** is used as a Template and View Engine as it is light-weight and also let’s us avoid implementing any View Resolvers for our application.
* **MVC Design pattern** was implemented for this application as the features implies the pattern of Model-View-Controller.
* **DTO (Data Transfer Object) design pattern** is used for the entity - User.

Advantage of using DTOs on RESTful APIs written in Java (and on Spring Boot), is that they can help hide implementation details of domain objects (aka. entities). Exposing entities through endpoints can become a security issue if we do not carefully handle what properties can be changed through what operations.

* **Maven** is chosen as a build tool over Gradle as we are building a standard J2EE application which doesn’t need much customization in project structure or build scripts.

# Enhancements(if I had more time)

* Currently Logging is not implemented but can be implemented using Spring’s default Logback implementation.
* Unit Test cases were created and run for all Repository methods using Junit4, screenshots attached in the GIT repository.
* Security can be enhanced by implementing JWT using Keycloak as authorization server.

Source code available at <https://github.com/srujanav67/OnlineTODOListApp>