SWE-642 group:

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SWE-642 Homework #3 Summary

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# ReadMe

* Deployed application link (please note this was not mandatory for 642 to deploy to EC2)
  + <http://ec2-44-212-23-222.compute-1.amazonaws.com:9191>
* Go to pom location of spring boot Rest API application
* cd hw3-app
* mvn clean compile package
* check target folder, you will find executable war “hw3-rest-1.0.0.1.war” as we are using packaging as war, it could be jar also as it is self-contained assembly with built-in tomcat.
* Run the application after successful build in above step
  + java -jar target/hw3-rest-1.0.0.1.war

Should say Started as in below screen shot.

A screen shot of a computer

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* At this point Rest API application is running at 9091, verify <http://localhost:9191/surveys>
* Goto Angular Front end, open in VS code or command line.
* cd hw3-app/hw3-web/
* ng serve
* After some time, you should see “Compile successfully”. Verify <http://localhost:4200/>. You will see survey form opens by default and two links at the top right.

A computer screen with white text

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A close up of a sign

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###### **The submission zip contains:**

1. setup-instructions document
2. all source files including Rest API, Angular Frontend, war file
   1. hw3-app holds both spring boot Rest API and under it “hw3-web” Angular Frontend
3. Recording of application working via Zoom meeting
4. Link to recording

<https://gmuedu-my.sharepoint.com/:f:/g/personal/gsharma6_gmu_edu/EkFp7wUzTuZPo5RztkfLvbYBqhGCYMhlEFcy-D8F-dgd0A?e=bllAyS>

# Statement of contribution

All group members did setup of various components involved in the homework including spring boot restful web services, Angular2+ frontend environment setup, web application setup, analysis, design, development, integration with Rest API and testing end to end. Then we compiled the documentation, reviewed, edited, and prepared the final submission. The following are specific focus areas for each member.

Shreyas Mallya: Worked on spring boot initial setup and implementation. Reviewed and edited the document.

Rachna Latkar: Worked on front-end application and testing. Reviewed and edited the document.

Govind Sharma: Worked on spring boot rest API, frontend integration with Rest API and testing. Reviewed and edited final document.

Anjali Sharma: Worked on AWS MySQL database setup, integration of RDS MySQL with Rest API and implementation of frontend and back end. Took a first cut at the submission documentation.

Nehanth Pavuluri: Worked on spring boot CRUD application and initial version of Angular application. Reviewed code and performed testing. Reviewed and edited the document.

# AWS MySQL RDS Database

1. Login to console

<https://us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:gdb=false;s3-import=false>

1. In Services, search for RDS
2. Click Create database
3. Choose MySQL

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1. Keep default Engine Version
2. Choose Free tier.

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1. Under Settings, Provide unique name for database instance and setup admin master password.

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1. Make sure MySQL port is open or for the purpose of the project, you may allow All Traffic.

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1. Keep default selections.
2. See estimated cost ~$15/month
3. A screenshot of a computer screen

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4. Hit Create database
5. After some time, you will see, database Instance is running

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# Spring Boot Rest API Application

We created Maven spring boot starter project with spring web, spring data JPA and my SQL driver dependencies.

Maven pom with required dependencies:

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## Spring Boot Starter Class with annotation @SpringBootApplication:

**/hw3-rest/src/main/java/com/stil/hw3/Hw3Application.java**

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## SurveyRepository:

Repository interface extending JpaRepository which by default provides CRUD operations eliminating boiler code otherwise written by developer

**/hw3-rest/src/main/java/com/stil/hw3/repository/SurveyRepository.java**

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## Survey Entity

Entity class mapped to Survey table at MySql database defined in application.properties file

**/hw3-rest/src/main/java/com/stil/hw3/entity/Survey.java**

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## SurveyService

Service class which takes commands from controller and communicates with Repository to perform requested CRUD operations

**/hw3-rest/src/main/java/com/stil/hw3/service/SurveyService.java**

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## SurveyController

Spring boot Rest controller that holds methods mapped to URLs and communicates with service to perform requested operations

**/hw3-rest/src/main/java/com/stil/hw3/controller/SurveyController.java**

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# Angular2+ (Angular 12) Frontend Framework Application

* Create new angular project for homework
* ng new hw3-web
* Router with two links with survey being default route when application runs:
* src\app\app-routing.module.ts

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* src\app\app.component.html

A screen shot of a computer code

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* src\app\app.module.ts

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* src\app\survey.service.ts

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A screenshot of a computer code

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* There are two components one for survey form functionality and the other for listing all surveys coming from MySQL database via Rest API.

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* src\app\survey\survey.component.ts
* Survey component calls service injected in constructor which in turn calls Rest API to persist survey form data.

A screen shot of a computer

Description automatically generated

* src\app\surveysuccess\surveysuccess.component.ts
* This controller calls service to fetch all surveys so far exist in the database. As user successfully completes the form and submits, new row is added for “List All Surveys” page. You can search for your entry in the list.

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A screenshot of a computer code

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# Testing Spring Boot Rest API - get, post, put, delete via postman

We used postman to verify Rest API application is working as intended, persisting to MySql database and getting data from Rest API deployed at <http://localhost:9191/surveys>.

#### Add One/Single Survey:

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#### Add List of Surveys:

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#### Get All Surveys:

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#### Get Survey By Id:

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#### Get Survey By First Name:

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#### Delete Survey By Id:

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#### Update Survey:

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# Integration of Rest API with Frontend Angular Application

Angular frontend application calls Rest API post and get methods mapped to the URLs. Angular controller calls global service to post survey or get all surveys. Please see screen shots in Angular front-end application description.

# Running of the project

Please follow the steps below to make sure all components involved in the project are up and running in the order.

Check the database is running as identified in the Rest API application.properties file. I am using DBeaver for AWS RDS setup.

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Start spring boot restful webservices project first. Look for starter class which is annotated with “@SpringBootApplication” 🡪right click 🡪run as Java Application

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Verify by get URL or by using postman (API testing tool explained above in Rest API section)

<http://localhost:9191/surveys>

You should see Json is returned listing all surveys.

A close-up of a white background

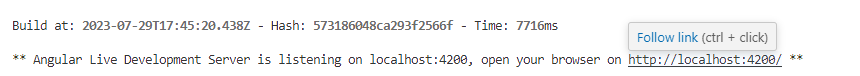
Description automatically generated

##### After successfully starting and verifying Rest API application, go to angular project home, perform below steps

* Open hw3-web folder in VS code (we used Visual Studio Code)
* npm install (do this first time so that dependencies come to your local environment)
* ng serve (wait for it to compile and provide URL)

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* Follow the URL it gives after successful compilation

<http://localhost:4200/> which will redirect to <http://localhost:4200/survey> as we have setup default route path as survey form (explained in Angular frontend project setup)

* At the top right hand side, you see two links, Survey Form and List All Surveys

A screenshot of a survey form

Description automatically generated

* Click on link “List All Surveys” to view all surveys.

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##### Validation:

* firstName, lastName, Street Address, city, state, zip, phone, email and date of survey are required fields and have proper validation by Angular2+ validation mechanism such as required, invalid, format matching, touched.
* Form submission button is disabled until form is validated with all required values and proper format.
* If a field is touched and does not have valid input, the application will provide an appropriate error message.

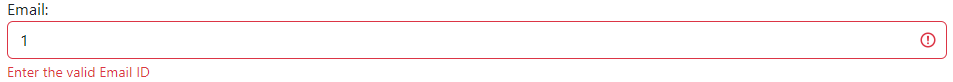
A screenshot of a survey form

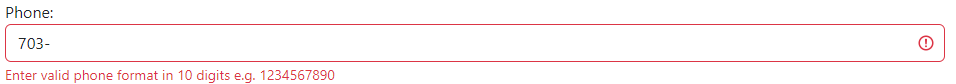
Description automatically generated





* If the field is touched and the value entered is not in proper format as expected, you will get appropriate message such as enter valid Email ID.





#### Example valid form with Submit Feedback enabled when form has all required information:

After successful submission, the application will acknowledge student feedback with confirmation message. At this point, you can click on “List All Surveys”, you will find your entry in the list (search).

A blue square with black text

Description automatically generated

A screenshot of a survey

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A screenshot of a computer

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##### Trouble shoot connection issue with API and database:

Since the angular2+ frontend connects to Restful API application at (<http://localhost:9191/addSurvey>) for posting the survey to API and persisting to database, if you see submit is taking too long, restart spring boot API application again. The connection might be broken.

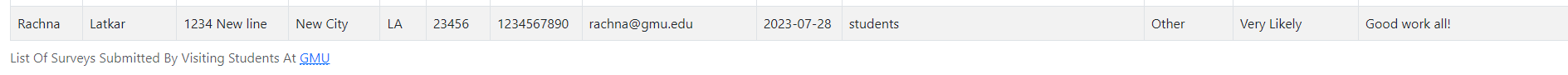
Once successful submission, you can verify that survey persists in database by calling get all surveys API URL from browser or from postman/insomnia.

<http://localhost:9191/surveys>

You will see newly saved survey will be added as last row with your entries.

You may also verify by calling web application “List All Surveys”

<http://localhost:4200/surveysuccess> , new submitted survey will be listed (search if needed).



Clear button is provided to reset form to its original state by clearing user entries.

# References

SWE-642 course lectures

<https://spring.io/>

https://angular.io/

<https://docs.aws.amazon.com/>