Sri Lanka Institute of Information Technology

B.Sc. Honors Degree in Information Technology

Specialized in Software Engineering

Practice Examination
Year 3, Semester 1 (2021)

SE3040 – Application Frameworks

Duration: 4 Hours

June 2021

Instructions to Candidates:

- This paper has 1 question.
- The total marks for the paper is 100.
- This paper contains 4 pages, including the cover page.
- Please see the instructions at the end of the paper

- You have been selected as the developer for a taxi service. After the discussions with related parties, the product team has come up with the following noticeable points.

1. The system is built mainly around categories and vehicles. Categories and vehicles share a many-to-many relationship. See the **example below**.
    a. Vehicles - Three wheelers, mini cars, vans, luxury cars …
    b. Categories - Short trips, long trips, weddings, special occasions …
2. A web interface is required to display all categories and vehicles belongs to a category. You can come up with your own design.
3. 3rd parties' and vendors are interested in accessing following data.
    a. View categories.
    b. View vehicles.
    c. Insert vehicle.
    d. View vehicles in each category.

    All the above services and not CPU heavy (please consider this when you are selecting the technology).
4. Another special service is to calculate the trip charges. It requires users to select the vehicle, trip type, duration etc. You can come up with your own method to calculate the charges. This service is expanding and will be a CPU heavy task, please consider this when you are selecting the technology.

Note the following points as well.

1. Come up with the RESTful services that are required for the project including the following.
    a. Add new vehicle- Pass all the categories room belongs to as a list of IDs.
    Ex: {

        code: "ABC - 4567",

        model: "Toyota"

        type: "sedan"

        name: "Allion"

categories: [Category ID]

}

b. Get vehicles in each category.

2. Vehicles and categories data structure should be flexible.
3. There is no concern for transaction control and consistency in this system.

Architect suggests using the following technologies and you must select the best suitable technology depending on the requirements being provided **(You don't need to use all the technologies).**

1. React JS
2. Node JS/Koa JS/Express JS
3. MongoDB
4. Spring Boot

Deliverables

Please follow the steps to upload the deliverables to the submission link.

1. Make sure there are no compilation or run time issues in your ReactJS project.
2. Remove the node_modules folder from the project folder structure.
3. Create a report including the screenshots of the frontend implementations and code snippets of the backend implementation. When adding backend implementation add brief description of the usage of technologies and why you choose that technology for your project.
4. Append screenshots of the MongoDB collections to the report as well.
5. Add the prepared pdf document of the report to the project folder.
6. Zip the project folder and upload using the provided submission link.

Marking Rubric

1. Implementation of UI for view categories and rooms belongs to a category. - 24 marks
2. Implementation of get categories, get vehicles, add categories, and add vehicles belongs to a category service endpoint. - 30 marks
3. Implementation of Trip charges calculation service. - 24 marks
4. Suitable technology selection (Student will be eligible for this mark if only he/she select the correct technologies for the different parts of the application). - 10 marks
5. At least one-unit test for either part of the application (UI, services). - 5 marks
6. Styling of the UI. - 2 marks.
7. Coding standards and quality - 5 marks

Note: Following are considered when awarding marks for Coding standards and quality.

1. Following the REST architecture (resource paths).
2. Variable, function, and class naming.
3. Clear file and directory structure.

--- End of the Paper ---