Practical Assessment

The following are prerequisites for taking the assessment:
- Internet connection;
- Access to GitLab.com;
- Own PC/Laptop;
- Java openJDK/oracleJDK and supported IDE;
- Gradle/Maven Build tool
- Continu2 - 24 hours;

April 2020

Context: Imagine you want to show kids how to draw a triangle, just like any of the ones in Table 1 below. A triangle can be of any size (i.e. **numberOfRows**), and allows kids to use any **symbol** of choice. NB: A **symbol** is a single ASCII character.

Table 1: Sample Triangles with different sizes and symbols

Triangle1	Triangle2	Triangle3
* *** ***** ******* ********* ***********	+ +++ ++++	k kkk kkkkk kkkkkkk

Objective: As a software developer, you quickly decide to design and develop an application so that the kids can see the beauty of programming while learning shapes.

Requirements: Use Java and related technologies (of your choice) to address the following requirements:

1. Design and implement an algorithm to achieve the objective stated.

2. Your solution should be a web application to enable multiple users to access the application with custom/different inputs (**numberOfRows** and **symbol**) for each user.

    You are required to build at least two main screens for a user to navigate through, which will enable the user to login and and play the triangle game:
    a. The web application (especially the triangle drawing page) should be password protected, and each user should have unique login credentials. A user should be able to logout.

    b. Activate at least three sets of login credentials for testing purposes. There is no restriction on how to create/register user accounts

    c. On first time login, all users should be redirected to a Triangle-Page which displays a default triangle and input options. Default triangle is **Triangle2** as shown in Table 1 above, thus:
        ■ **numberOfRows = 3**; and
        ■ **symbol = "+"**

    d. When logged-in, a user should always be able to specify new input options for drawing a triangle. On submitting these options (**numberOfRows**, and **symbol**), an updated triangle should be displayed together with the user inputs.

    e. Subsequent to changing triangle options, when a user logs-in, the system should display a triangle based on the user's latest input options, together with those user options in the input form.

    f. Every time a user submits triangle (input) options, such input options should be saved in a database (of your choice) for later use. These user input options are only applicable to the user who provided them.

3. Audit all user input options to determine the most frequent/preferred number of rows (***popularRows***) and symbol (***popularSymbol***), not just by a single user but all system users.

4. Expose the most frequent/preferred number of rows (***popularRows***) and symbol (***popularSymbol***) by all users as a REST service. Only cater for GET requests. There is no requirement to secure the endpoint which serves as an API to other systems that consume JSON media type. However, should you decide to secure it, provide details for the API access.

5. Include Tests such as Unit and integration tests where necessary;

6. Push your work to a central git repository that you clone/pulled from, e.g. https://gitlab.com/abc-xyz.git.

7. Document all information and instructions as part of the readme file of the project, for someone else to test and make use of your application. Also includes login credentials to use for testing.