

## **COURSE- SEZG583 SCALABLE SERVICES**

### **ASSIGNMENT- MICROSERVICES DEVELOPMENT AND DEPLOYMENT**

Submission Date: 10<sup>th</sup> November 2024

Assignment Submission Mode: LMS- File Upload

Weightage: 20%

#### **OBJECTIVE:**

To create a microservice based application and deploy it

Note: This a group assignment. Group size(max 4 members) .Each group has to select one application of their choice to do the assignment

#### **PROBLEM STATEMENT:**

##### **PART 1: DESIGN**

Design a scalable Microservices architecture for the application of your choice. Design a scalable architecture for the chosen application.

Identify the system operations (commands and queries) for the application based on the core functional use case of the application

Identify the business capabilities and map them to services

Assign the system operations to the services and identify the collaboration between the services.

##### **PART 2: IMPLEMENTATION**

Select any two microservices identified in the previous step and implement them.

Identify the technologies to be used for the microservices development, databases, and communication of the services. Use a suitable approach for the communication between the services.

Each service should be maintained as a separate code repository so that it can be developed, deployed, and tested independently.

##### **PART 3: DEPLOYMENT**

Deploy each service on separate docker containers.

Deploy your application to the Kubernetes cluster.

Run a minikube cluster on your local machine and deploy your application on the cluster

Access the Kubernetes dashboard and analyze the deployments made

[Optional] Explore options for a CI/CD and Create a CI/CD pipeline

#### IV: SUBMISSION INSTRUCTIONS

- 1) Create a detailed documentation, with the description of application, design and architecture of the application with diagram, deployment plan, project structure of the services.
- 2) In the document, Briefly describe the steps involved in the implementation and Attach snapshots of the service calls from postman, responses from the services, kubernetes dashboard etc.,
- 3) Upload your code to Github and provide the link to repositories in the document
- 4) Create a demonstration video (a screen recording ) to show the deployment of the services and their working.
- 5) Include details of the group members in the document
- 6) All of this has to be submitted in a single zip file with the file name as <Group ID>\_<application name>. Each member of the team has to upload the zip file in the elearn page.
- 7) While naming the files use your Group ID /group name for identification purposes
- 8) Academic Honesty: You are welcome to discuss with peers and refer the internet in order to better understand the concept, but you may not share code or do not do a verbatim copy from the internet. The code will be tested for plagiarism. If found guilty, no marks will be awarded

#### Files to Be Submitted

- 1) Detailed documentation

It contains

- Details of the group members
- Description of application
- Design and Architecture, system operations and services identified, deployment plan
- Project structure of the implemented services
- Github Link
- Execution instructions
- Snapshots (service calls from postman, responses from the services, kubernetes dashboard etc)

2) Demonstration Video (Note: if you are exceeding size limits when uploading videos to elearn portal, a google drive link will be shared on request to upload the video, documentation has to be uploaded to elearn only)

#### V WEIGHTAGE:

**Total: 20 Points**

**Part 1: 6 Points**

**Part 2: 7 Points**

**Part 3: 7 Points**

#### VI EVALUATION

The relevant documents to be submitted in elearn taxilla. After the completion of deadline, Assignment will be evaluated on the submissions made. **Though it is a group assignment, it is required from each of you to upload the assignment in the elearn page. If there are no submissions, no marks can be awarded.**

#### VII NOTES:

- This is a take-home assignment to be carried out by each group independently
- In case of any further queries, use discussion forums, or reach out to me at [bharani.k@wilp.bits-pilani.ac.in](mailto:bharani.k@wilp.bits-pilani.ac.in)