SIT323/SIT737- Cloud Native Application Development

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5.2D: Dockerization- Publishing the microservice into the cloud

GitHub Link: https://github.com/AndyWanng/sit323-737-2024-t1-prac5d.git

Docker Pull Command: *docker pull LOCATION-docker.pkg.dev/PROJECT-ID/REPOSITORY/IMAGE:TAG*

Code Overview:

This project is structured into four key components: auth-server, calculator-server, frontend-server, and Nginx. Each server is a microservice with its own responsibilities, environment configurations, and Dockerfile for containerization. auth-server manages authentication; calculator-server handles calculation processes; frontend-server delivers the user interface; and Nginx routes requests and serves the frontend content. All services are designed to be deployed using Docker, ensuring scalable and consistent runtime environments.

Getting Started

Prerequisites

To run this project, you'll need:

- Git
- Node.js
- Docker
- NPM

Installation

1. **Clone the repository** or download the project files to a local directory.
2. **Navigate to the project directory** in your terminal or command prompt.

Running the Service(Using images from Dockerhub)

1. **Configuring the auth for docker** by running:
   gcloud auth configure-docker \australia-southeast2-docker.pkg.dev

2. **Pulling the images from Dockerhub** by running:
   docker pull australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/nginx:latest

   docker pull australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/frontend:latest

   docker pull australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/calculator:latest

   docker pull australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/auth:latest

3. **Running the service** by running:

   docker run -d --name nginx -p 80:80 australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/nginx:latest

   docker run -d --name frontend -p 3000:3000 australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/frontend:latest

   docker run -d --name auth -p 3001:3001 australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/auth:latest

   docker run -d --name calculator -p 3002:3002 australia-southeast2-docker.pkg.dev/sit323-24t1-wang-557c4cc/task-calculator/calculator:latest

4. **Configuring the network** by running:

docker network create my-network

docker network connect my-network auth

docker network connect my-network calculator

docker network connect my-network frontend

docker network connect my-network nginx

5. **Accessing the service**: The service can now be accessed through HTTP GET requests. You can use a web browser, Postman, or curl to make requests.

API Endpoints

The service exposes four endpoints, one for each arithmetic operation. The endpoints are accessed via GET requests and expect two query parameters: num1 and num2, representing the operands.

- **Addition**
    - Path: **/api/calculate/add**
- **Subtraction**
    - Path: **/api/calculate/subtract**
- **Multiplication**
    - Path: **/api/calculate/multiply**
- **Division**
    - Path: **/api/calculate/divide**
- **Exponent**
    - Path: **/api/calculate/exponent**
- **Square**
    - Path: **/api/calculate/sqrt**
- **Module**
    - Path: **/api/calculate/modulo**

Error Handling

The service provides meaningful error messages for invalid input (e.g., non-numeric values) or unsupported operations.

Logging

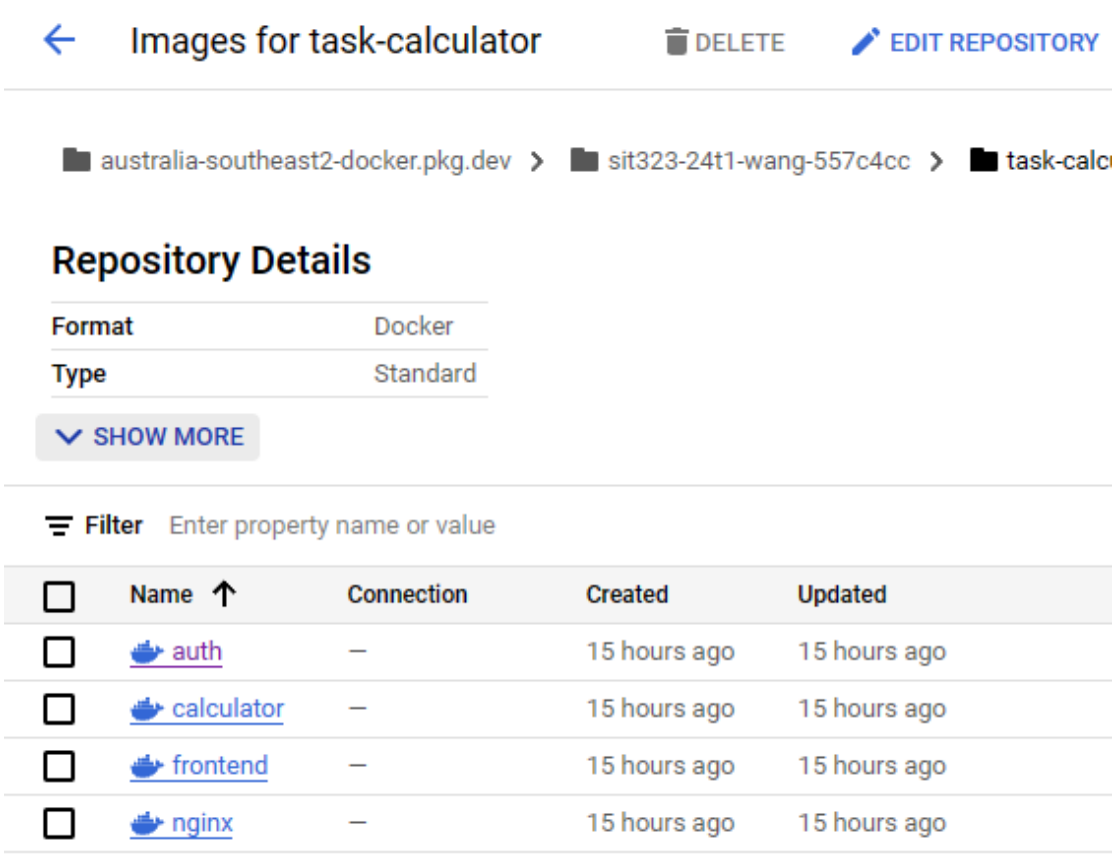
Logs are generated using Winston and are divided into console logs for info level and file logs for error and combined logs. Logs are stored in the logs directory.

Conclusion

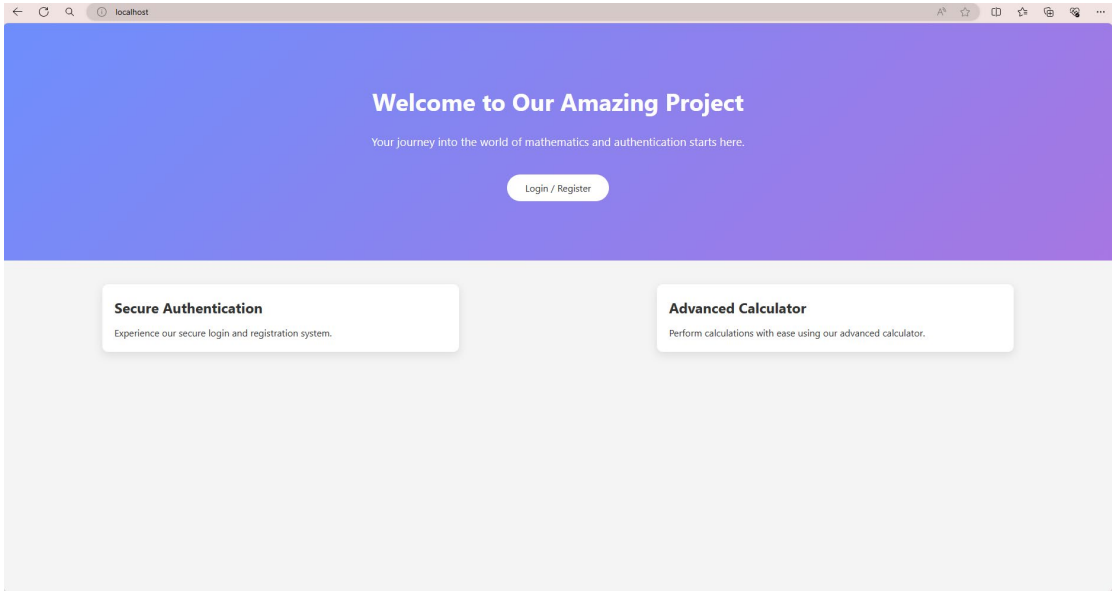
This document outlines the steps to set up and use the Calculator Microservice. By following the instructions provided, users can perform arithmetic operations through a REST API built with Node.js and Express.

Screenshots:

My Artifact Registry



Home page:


localhost
Welcome to Our Amazing Project
Your journey into the world of mathematics and authentication starts here.
Login / Register
Secure Authentication
Experience our secure login and registration system.
Advanced Calculator
Perform calculations with ease using our advanced calculator.