SIT323/SIT737- Cloud Native Application Development

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4.1P: Building a simple calculator microservice

GitHub Link: https://github.com/AndyWanng/sit323-737-2024-t1-prac4p.git

Code Overview:

The Calculator Microservice is a simple REST API designed to perform basic arithmetic operations: addition, subtraction, multiplication, and division. It accepts two numeric inputs and returns the result of the operation. This service is built using Node.js and the Express framework, and it employs Winston for logging.

Getting Started

Prerequisites

To run this project, you'll need:

- Node.js installed on your machine. Download and install it from Node.js official website.
- NPM, which comes with Node.js.

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.
3. **Install dependencies** by running the command:

   npm install express winston

   This will install Express for the web server functionality and Winston for logging.

Running the Service

1. **Start the server** by running:

   node calculator.js

   If everything is set up correctly, you should see a message indicating that the server is running on port 3000.

2. **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: **/add**
  - Example: **http://localhost:3000/add?num1=10&num2=5**
- **Subtraction**
  - Path: **/subtract**
  - Example: **http://localhost:3000/subtract?num1=10&num2=5**
- **Multiplication**
  - Path: **/multiply**
  - Example: **http://localhost:3000/multiply?num1=10&num2=5**
- **Division**
  - Path: **/divide**
  - Example: **http://localhost:3000/divide?num1=10&num2=5**
  - Note: Dividing by zero will return an error.

Error Handling

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

Logging

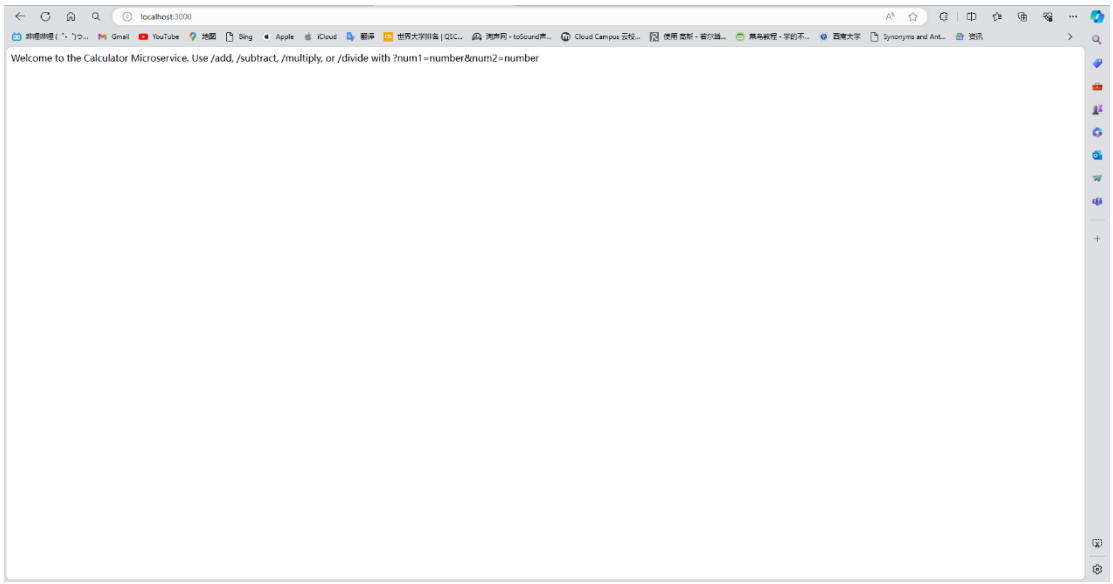
Logs are generated using Winston and are divided into console logs for info level and file logs for error and combined logs. Logs are stored in the logs directory.

Conclusion

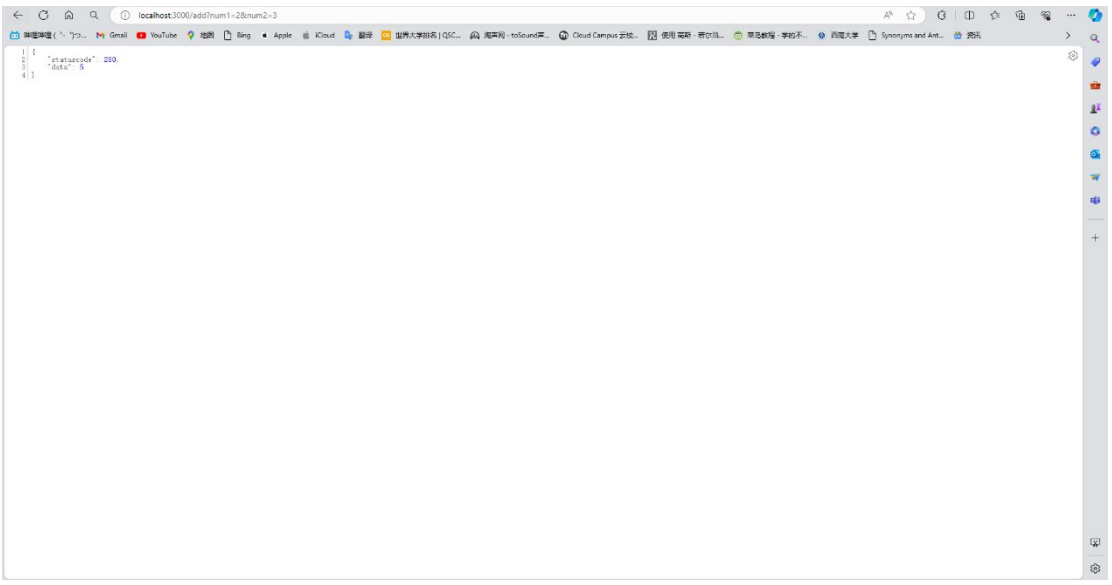
This document outlines the steps to set up and use the Calculator Microservice. By following the instructions provided, users can perform arithmetic operations through a REST API built with Node.js and Express.

Screenshots:

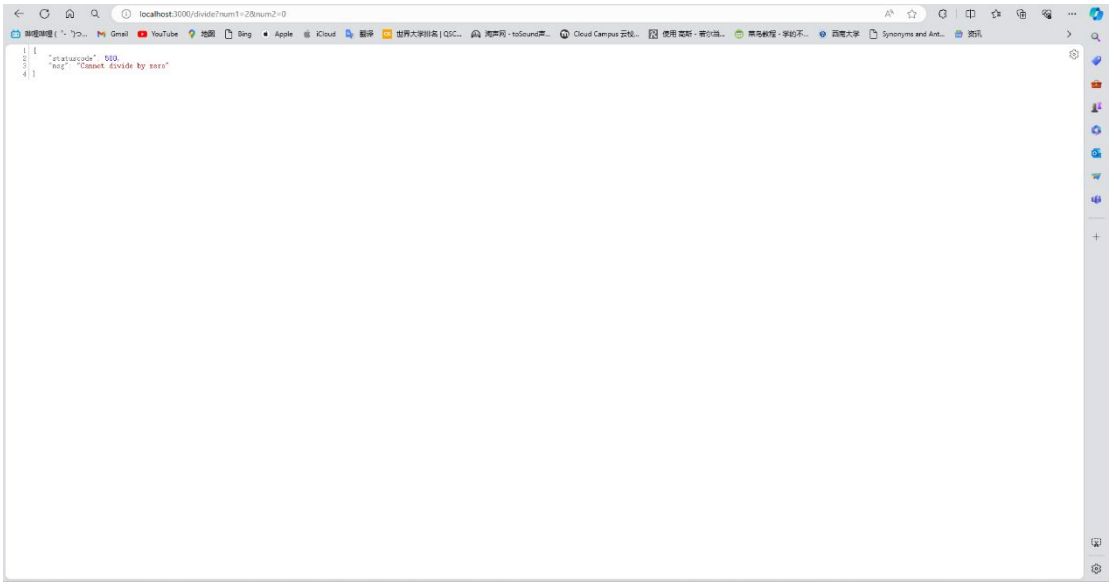
Welcome page:

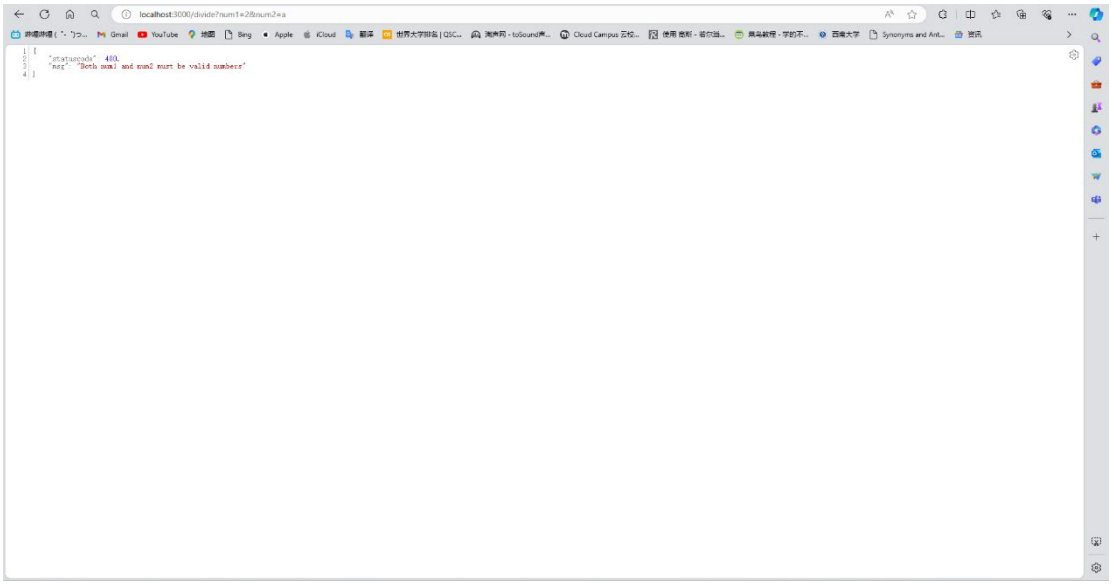


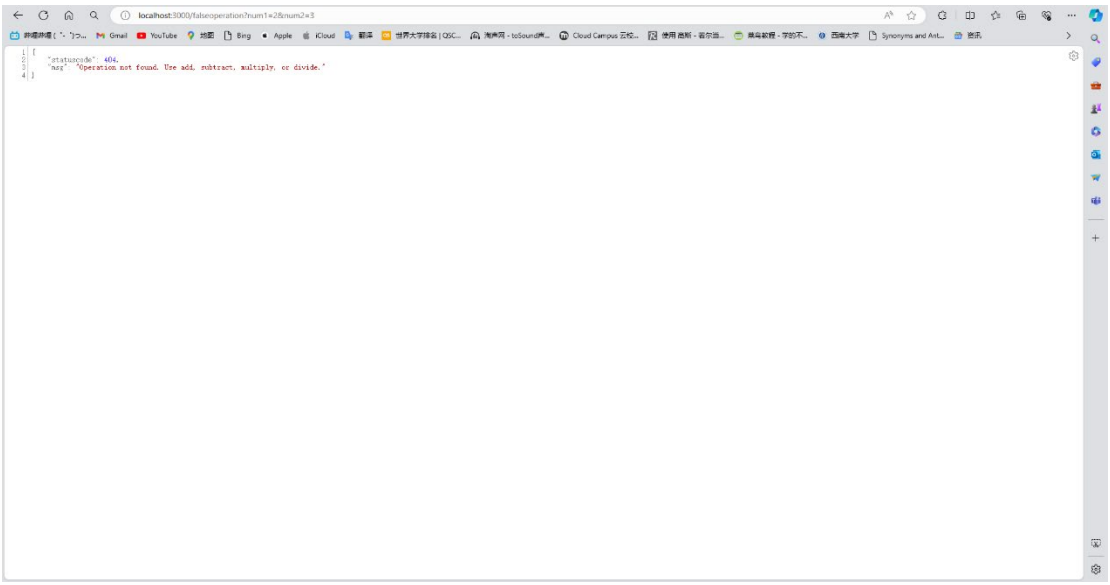
Functions:



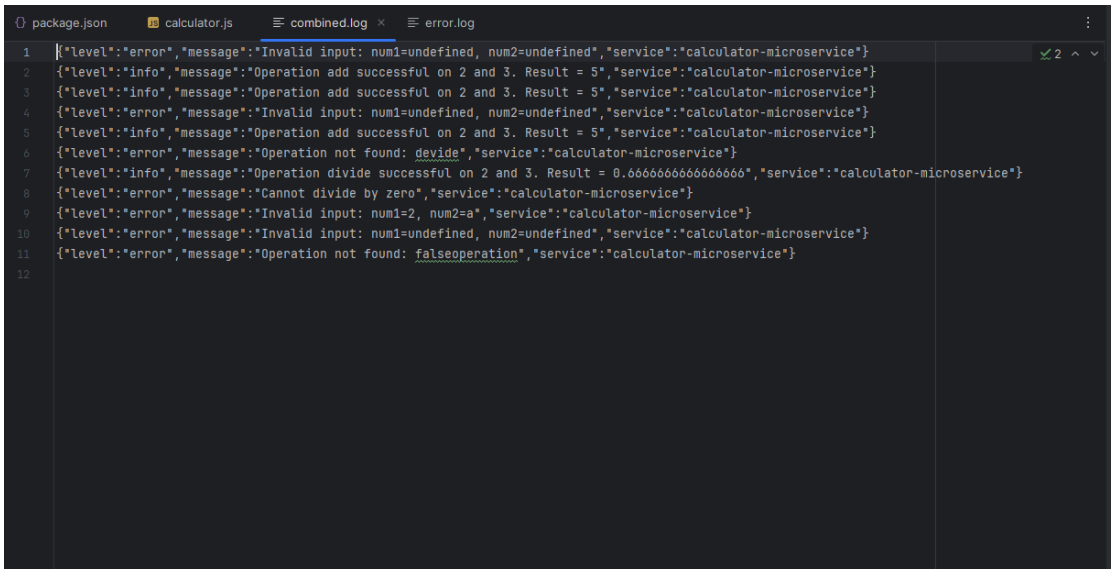
Error handling






localhost:3000/falseoperation?num1=2&num2=3
{
"statuscode": 404,
"msg": "Operation not found. Use add, subtract, multiply, or divide."
}

logs


package.json
calculator.js
combined.log
error.log
{"level":"error","message":"Invalid input: num1=undefined, num2=undefined","service":"calculator-microservice"}
{"level":"info","message":"Operation add successful on 2 and 3. Result = 5","service":"calculator-microservice"}
{"level":"info","message":"Operation add successful on 2 and 3. Result = 5","service":"calculator-microservice"}
{"level":"error","message":"Invalid input: num1=undefined, num2=undefined","service":"calculator-microservice"}
{"level":"info","message":"Operation add successful on 2 and 3. Result = 5","service":"calculator-microservice"}
{"level":"error","message":"Operation not found: devide","service":"calculator-microservice"}
{"level":"info","message":"Operation divide successful on 2 and 3. Result = 0.6666666666666666","service":"calculator-microservice"}
{"level":"error","message":"Cannot divide by zero","service":"calculator-microservice"}
{"level":"error","message":"Invalid input: num1=2, num2=a","service":"calculator-microservice"}
{"level":"error","message":"Invalid input: num1=undefined, num2=undefined","service":"calculator-microservice"}
{"level":"error","message":"Operation not found: falseoperation","service":"calculator-microservice"}