# Task 4.1P – Documentation

Repo link : [Pasindufdo98/sit737-2025-prac4p](https://github.com/Pasindufdo98/sit737-2025-prac4p)

This project is a basic calculator microservice built using Node.js and Express. It includes four API endpoints to perform arithmetic operations: addition, subtraction, multiplication, and division. Additionally, the microservice uses the Winston logging library to track incoming requests and errors, which is useful for development and troubleshooting.

## Step-by-Step Instructions

**Microservice Development**

1. Initialize a Node.js Project

• Open the terminal and create a new project folder. Then run the following commands:

npm init -y

npm install express

2. Create the Express Application

Create a file called index.js and set up a basic Express server that listens on port 3040.

3. Design and Implement API Endpoints

Four GET endpoints were created: /addition, /subtraction, /multiplication, /division

4. Add Input Validation and Error Handling

The service checks for valid number inputs and handles division by zero errors with appropriate messages.

**Adding Winston Logging**  
  
1. Install Winston

Run npm install winston

2. Configure Winston Logger

Logs errors to error.log, all info-level logs to combined.log, and console logs during development.

3. Log Request Information

Logs operation type, input values, and errors.

**Run the Application**

Start the server with node index.js

Test the Endpoints  
ex: Use browser to test the end points;  
 <http://localhost:3040/addition?n1=10&n2=5>  
<http://localhost:3040/substraction?n1=10&n2=3>  
<http://localhost:3040/division?n1=10&n2=5>  
<http://localhost:3040/multiplication?n1=100&n2=4>  
  
**Screenshots**

**Addition**  
  
A screenshot of a computer

AI-generated content may be incorrect.

**Subtraction**A screenshot of a computer

AI-generated content may be incorrect.

**Multiplication**A screenshot of a computer

AI-generated content may be incorrect.

**Division**A screenshot of a computer

AI-generated content may be incorrect.

**Invalid Parameters**A screenshot of a computer

AI-generated content may be incorrect.A screenshot of a computer

AI-generated content may be incorrect. **Winston Log files**A screenshot of a computer

AI-generated content may be incorrect.A screenshot of a computer

AI-generated content may be incorrect. **GitHub Repo**

A screenshot of a computer

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.