# Math API – Project Startup Guide

This document provides step-by-step instructions to run and test the Math API project in a containerized environment using Docker and Rancher Desktop.

## 1. Prerequisites

Make sure you have the following installed on your system:

- Rancher Desktop

- Docker (enabled and set to 'containerd')

- SQL Server Management Studio (SSMS) for database inspection

## 2. Initial Setup

1. Clone or download the project.

2. Open the project folder in your IDE (e.g., PyCharm, VS Code).

3. The project structure should include at least the following files: docker-compose.yml, Dockerfile, requirements.txt, and the Python application code (in the /app directory).

## 3. Create the SQL Server Database

Before starting the containers, make sure to manually create the database (e.g., mathdb) using SSMS:

1. Open SSMS and connect to the server at `localhost,1433`.

2. Login using the username: sa and password: Str0ng\_Pa55!

3. Create a new database with the name `mathdb`.

## 4. Build and Start the Containers

In your terminal (inside the project directory), run the following command:

```   
docker compose up --build  
```

This command will build the API image and start both the API and SQL Server containers.

## 5. Test the Application

Once the containers are running, open your browser and go to:

http://localhost:8000/docs

This will open the Swagger UI interface where you can test the math operations (factorial, fibonacci, pow).

## 6. Inspect the Database

Use SSMS to connect to the SQL Server instance and inspect the 'operations' table inside the 'mathdb' database to view the logged results.

## Notes

- If the mathdb database is missing, the application will not start successfully.

- The database password must match in both docker-compose.yml and database.py.

## 7. Expected Result

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