

FlowAPI: Visual API Builder Platform

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Najah University - Graduation Project 2025/2026

Motivation & Problem Statement

FlowAPI is a visual no-code platform (BaaS) building, configuring, and deploying REST APIs without writing code.

The Problem

- Traditional API development is often complex, slow, and demands specialized coding skills.
- Many no-code solutions promise simplicity but oversimplify and hide critical details.

Our Solution

- FlowAPI offers the ease of visual no-code development for accelerated deployment.
- It provides clarity and power required for robust API creation.
- Avoids unnecessary complexity without sacrificing control.

What FlowAPI Does

FlowAPI introduces several core concepts that differentiate it from existing solutions, focusing on ease of use, flexibility, and scalability.

Visual Workflow Builder

Intuitive interface eliminates the need for coding knowledge.

Team Collaboration

collaboration feature to work efficiently with your team.



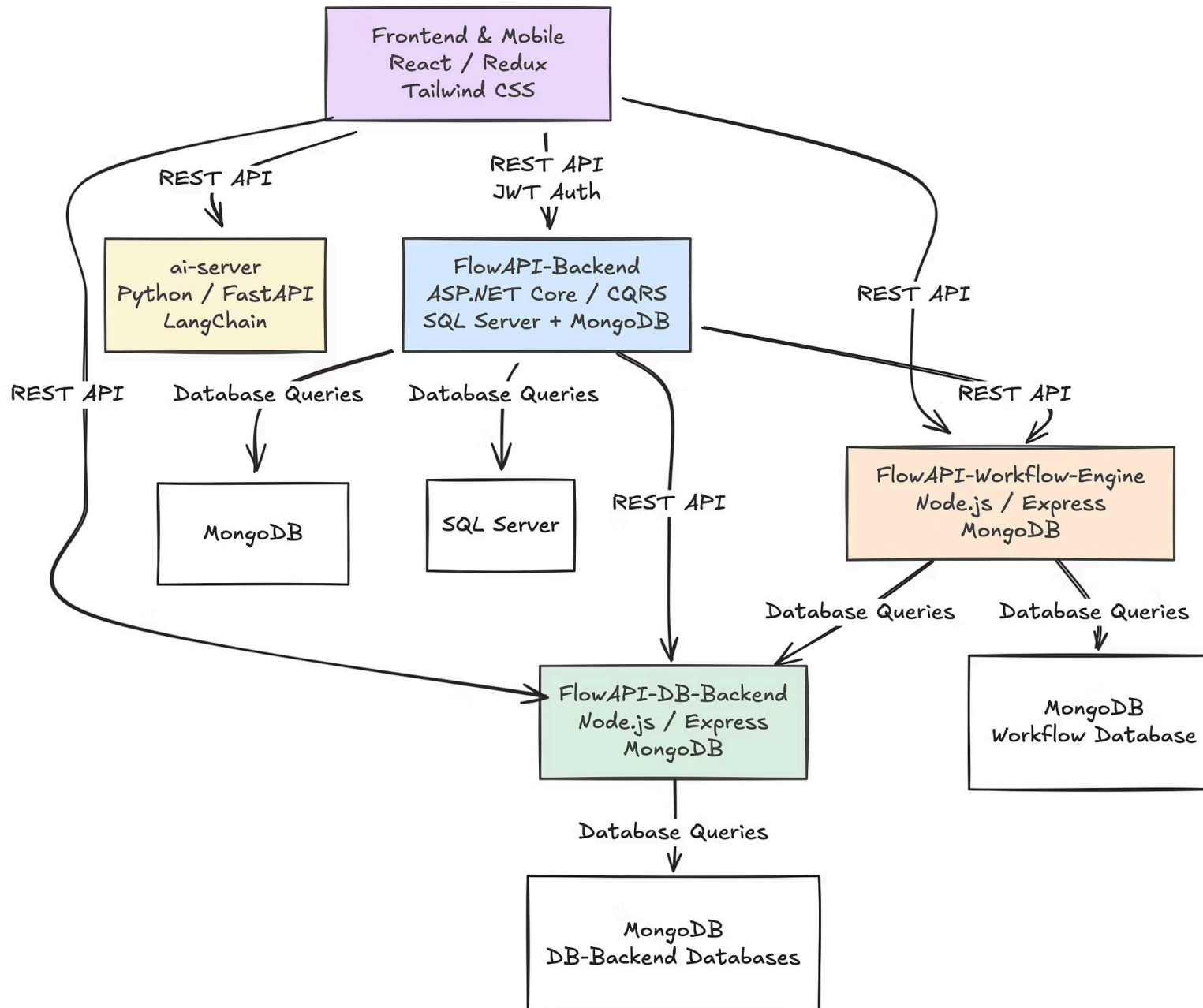
Database Builder

Integrated database management for seamless data handling.

Marketplace

Buy pre-built APIs to accelerate development.

System Design: FlowAPI Platform - Microservices



Backend Architecture: ASP.NET Core & Clean Design

The backend of FlowAPI is built on ASP.NET Core, utilizing a clean architecture approach to promote separation of concerns, testability, and maintainability. Key patterns like CQRS and MediatR are employed for robust command and query handling.

ASP.NET Core
Robust and scalable framework.

MongoDB
NoSQL document database.



Clean Architecture

Layered design for modularity.

CQRS & MediatR

Command-Query Responsibility Segregation.

SQL Server

Relational database management system.



Workflow Engine: RestAPI Logic

Node.js

Powers the workflow engine for efficient and asynchronous task processing.

MongoDB

Provides flexible data storage and retrieval, adapting to dynamic workflow requirements.



Authentication & Track Usage

Validate api-key and count usage



Function Stack Execution

Sequential processing of modular functions.



Placeholder Resolution

Dynamic data injection.



Error Handling

Robust error detection and management.

API groups

Folders to organize your API endpoints

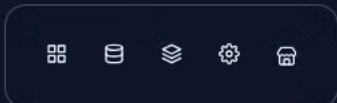
+ Add API Group

Hello world











































API Group

   [View](#)

- Endpoints



🔍 Search by path, ID, or description...

endpoint	authorization
GET /helloWorld  7dae6aaf-0962-4c54-bae6-acc95a46db97	    
GET /addTwoNumbers  4659af7e-76ec-483f-b015-d794c731d58d endpoint to find a+b which the user send them via parameters	    
GET /multiplyTwoNumbers  e9228868-a0d6-4416-b233-950afb7b1c36 an endpoint for multiply a and b make endpoint take a and b then return $a*b+b*a-2a-2b$	    
GET /getMax  e8f1db3e-77ec-4175-869e-d7a6b9300f1a endpoint to find max and min from the array	    
GET /findFactorial  46db89b4-09d2-436f-a852-8d2651f1f1f5 endpoint to find the factorial	    
GET /findAverage  6b38e823-8974-4a4a-8def-3dfcb14596d3 avg	    
GET /math/complex-eval  dc940aa3-15ea-43d4-bd7e-16d928896242 complex test	    

▼ 1. Inputs

Specify if this endpoint accepts any inputs or query parameters

body numbers ×



body len ×



+ Add input

▼ Function Stack

Add functions below to determine how your endpoint gets processed

Hold Shift + drag to select multiple

1  setVariable 



2  setVariable 

3  forEach 

+ Add function

▼ 3. Response

Optionally have this API endpoint return a value from above to the front-end

KEY	VALUE	
resul	{{result}}	
numbers	{{request.body.numbers}}	



Add input



Input Name

e.g., name, email, id

Input Method

Query Parameter



Cancel

+ Add Input

Add Response



Define a Key

Key

Define a value to return in the response



SAMPLE PREVIEW

```
{
  resul : {{result}}
  numbers : {{request.body.numbers}}
  len : {{request.body.len}}
  av : {{avg}}
}
```

Cancel

Add Response



Add Function



🔍 Search functions...

Database Requests

Database Request Methods



Data Manipulation

Variables, Loops, and Conditional Logic



Validation

Data validation and sanitization



Security & Tokens

JWTs and Token Management



Available Function Blocks

Database Requests

- getItem
- getItem
- insertItem
- editItem
- deleteItem

Security & Tokens

- createJwtToken



Data Manipulation

- setVariable
- ifElse
- throwIf
- forEach
- setArray
- addArrayItem
- deleteArrayItem
- getArrayItem

Validation

- simpleValidation

getItem

General Projection

key user

table users

Cancel Save

getItem

General Projection

SAMPLE PREVIEW

```
{  
   ID  
   created_At  
   email  
   password  
   role  
   active  
   token  
}
```

Filters 2

email Seq

Value: {{request.body.email}}

active Seq

Cancel Save

ifElse

var	operator	value
{{items0}}	==	Enter value

THEN EXECUTE THESE FUNCTIONS:

▼

Add functions below to determine logic that will execute if the condition is true

Hold Shift + drag to select multiple

+ Add function

else (optional)

OTHERWISE EXECUTE THESE FUNCTIONS:

▼

Add functions below to determine logic that will execute if the condition is false

Hold Shift + drag to select multiple

+ Add function

Cancel Save

simpleValidation

params query **body**

Add Field

email + Add

email

Type

string

REQUIRED

Enabled

PATTERN

^\S+@\S+\.\S+\$

+ Add Condition

password

Cancel Save

createJwtToken ✕

▼ Payload

+ Add Payload

Value

{{token13}}

expires in: 5m ▼

Cancel Save

Database Service: Multi-Tenant MongoDBs

FlowAPI utilizes MongoDB as its primary database, implementing a multi-tenant strategy to provide secure and isolated data storage for each tenant (user or organization).

NodeJs

Runtime for database service and multi-tenant operations.

MongoDB

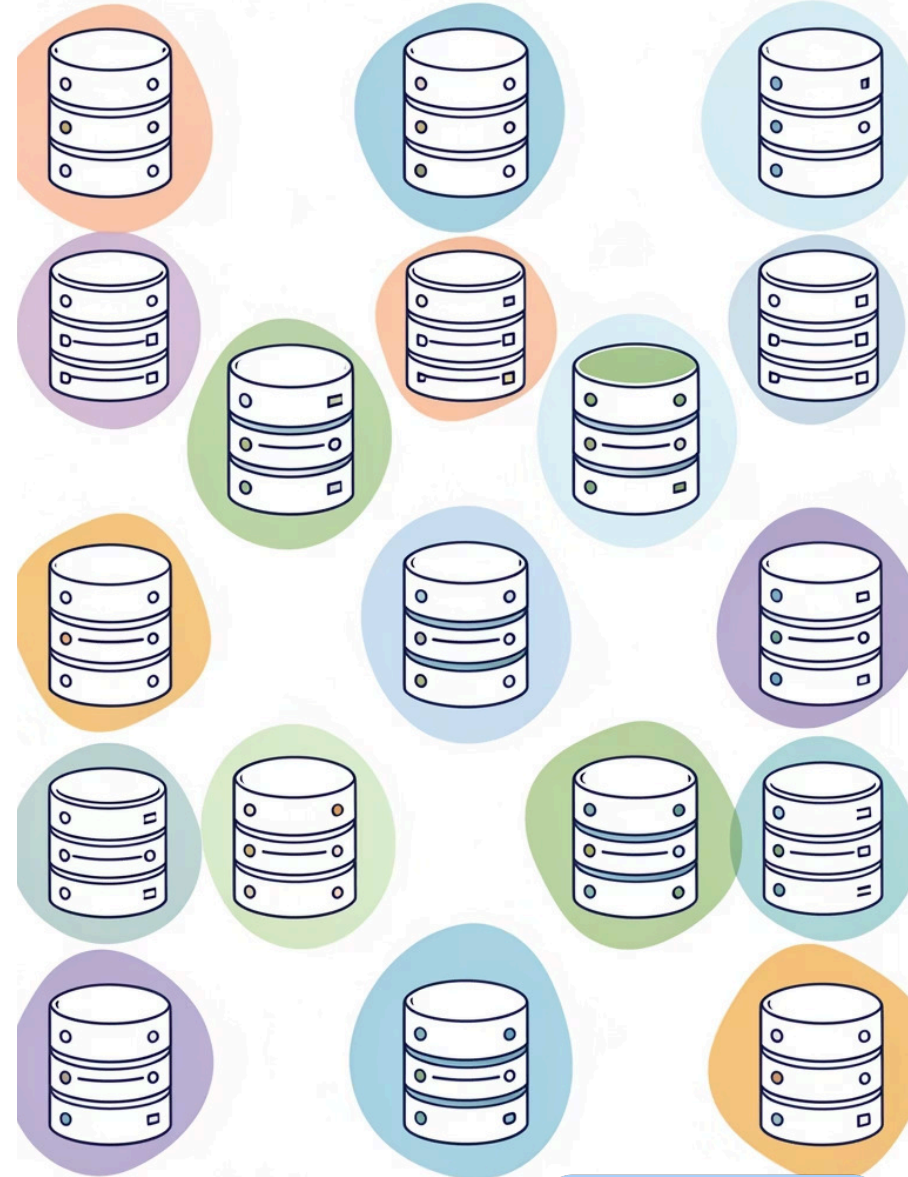
NoSQL flexibility for diverse data.

Multi-Tenant Strategy

Database-level isolation for security.

Schema Flexibility

Adaptable to evolving API requirements.



Database tables

+ Add table

Search

Database Tables (4)

tokens 696bc25d27dac7e62ef2f3ea

```
{
  ID: uuid
  created_At: Date
  expiresAt: Text
  token: Text
}
```

LOGS 696bb9c69264a449ccf96c61

```
{
  ID: Sequential
  created_At: Date
  userId: Reference
  action: Text
}
```

POSTS 696bb9599264a449ccf96bbc

```
{
  ID: ID
  created_At: Date
  userId: Reference
  title: Text
  content: Text
  active: Boolean
}
```

users 696ba41e9264a449ccf9677a

```
{
  ID: UUID
  created_At: Date
  email: Text
  password: Text
  role: Text
  active: Boolean
}
```

Table details



Table Name

Primary Key Type

Sequential ID



Description

Go Back

Add table

Create a database table



Import from JSON

Upload a JSON file with your table data









Required fields: name (string), columns (array of {name: string, type: string})



Enter data manually

Start with an empty table and add your columns, configure your table, and add data freehand

  Search  Filter  Sort  Hide Fields  Upload CSV  Download CSV  Reset filters

 ID 	 created_At 	 email	 password	 active	 role
c311578a-9d44-4c38-97c4-ae927d41bd18	2026-01-17T20:33:24.047Z	asemhesham55@gmail.com	Asem@123	<input type="checkbox"/>	admin
5d6df71d-989a-48c7-aec6-6c3efef6e2d6	2026-01-20T11:00:42.351Z	asemhesham44@gmail.com	Asem@123	<input type="checkbox"/>	user
1cfe7d5d-4791-4524-a020-65759b076991	2026-01-20T11:01:19.876Z	asemhesham555@gmail.com	Asem@123	<input type="checkbox"/>	user
e9d1000c-4877-47f2-acfd-580e2ad2f7fb	2026-01-20T11:08:43.902Z	amrBadran55@gmail.com	Asem@123	<input type="checkbox"/>	user
5d28efe8-3e52-4d08-a495-5797f4abd639	2026-01-20T14:31:29.192Z	asemhesham959@gmail.com	Asem@123	<input checked="" type="checkbox"/>	user
f6b9a31a-0fab-441e-a5f6-5909af2932c7	2026-01-21T21:10:24.406Z	asemhesham989@gmail.com	Asem@123	<input checked="" type="checkbox"/>	master

+ Add new record 6 records

Filter Records ✕

created_At ▼ not Equals ▼ 01/06/2026 📅 🗑️

Add Filter Apply Filters

Sort Records ✕

Sort by field


ID ▾

Direction

Ascending ▾

[Apply Sort](#)

- ID
- created_At
- email
- password
- active
- role
- token



Drag and drop your CSV file here
or

[Browse Files](#)

CSV Requirements:

- Column headers should match table field names
- Maximum file size: 5MB
- Supported data types: Text, Numbers, Booleans (true/false)

Available columns:

ID created_At email password active role token

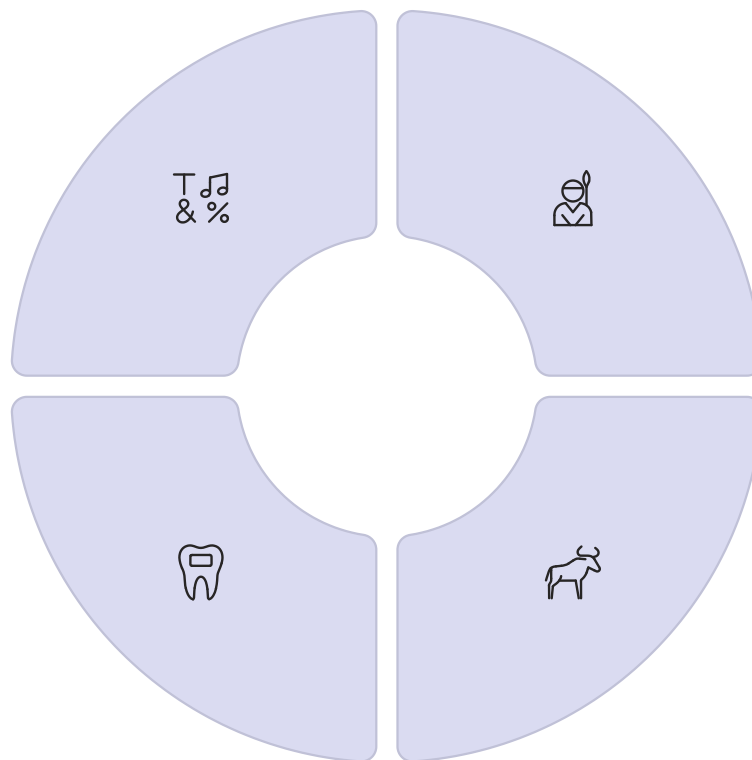
Frontend & Mobile App: Technology Stack

React.js

Powers dynamic and responsive single-page web applications for a seamless user experience.

Material UI

Provides a comprehensive suite of accessible and customizable React components implementing Google's Material Design.



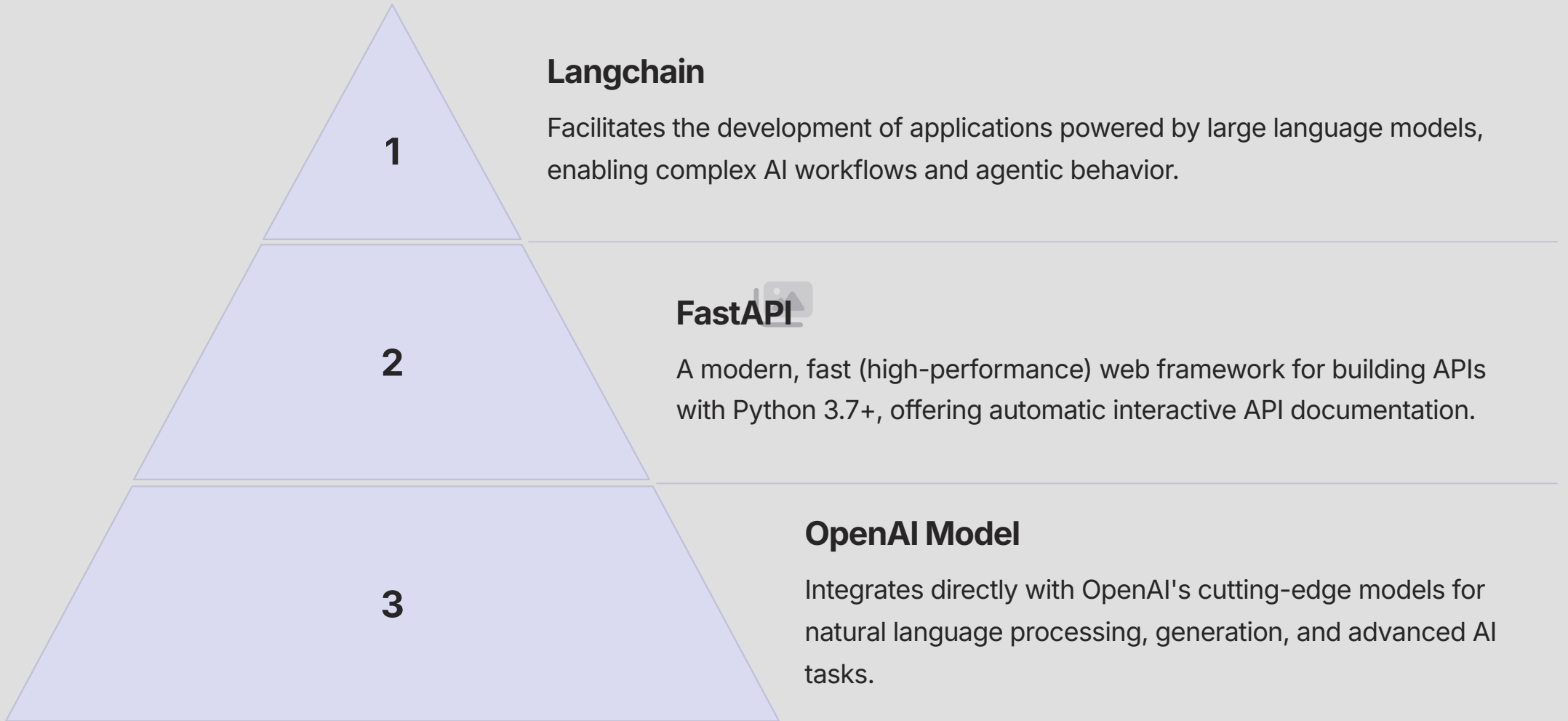
React Native

Enables cross-platform mobile app development, ensuring a consistent look and feel on iOS and Android.

Tailwind CSS

A utility-first CSS framework for rapidly building custom and modern user interfaces with flexibility.

AI Server: Technology Stack



▼ **1. Inputs**

Specify if this endpoint accepts any inputs or query parameters

+ Add input

▼ **Function Stack**

Add functions below to determine how your endpoint gets processed

Hold Shift + drag to select multiple


+ Add function


▼ **3. Response**

Optionally have this API endpoint return a value from above to the front-end

+ Add response



 ChatBot — ×

make an endpoint to find max number from the array , accept array as body parameter 

1. Inputs

Specify if this endpoint accepts any inputs or query parameters

body numbers ×

+ Add input

Function Stack

Add functions below to determine how your endpoint gets processed

Hold Shift + drag to select multiple

1 throwIf

2 setVariable

3 forEach

+ Add function

3. Response

Optionally have this API endpoint return a value from above to the front-end

KEY	VALUE
max	{{max}}



ChatBot

make an endpoint to find max number from the array , accept array as body parameter

08:03 PM



I've prepared some changes to your workflow based on your request.

Please review the updated workflow and accept or reject the changes.

Accept Changes

Reject

08:03 PM

Enter a command to build your



Marketplace



Tags

all



Price

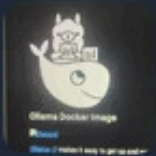
All

Free

Paid

Sort

Popular



Hello world

endpoint for return Hello world

@ by @asemDiab



2

[View Details](#)

Create New API Listing



Listing Name *

This will be the name shown in the marketplace. You can modify it from your application name.

Description *

Price (\$) *

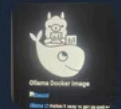
Select Application *

You must select an application to create a listing.

Tags

[Cancel](#)[Create Listing](#)

Tags all Price All Free Paid Sort Popular Grid Menu



Hello world
endpoint for return Hello world
by @asemDiab
2 likes

[Get](#) [View Details](#)

My Keys 0
No API keys yet



Book API

An Inventory API

@ by @FLOWAPI_USER

♡ 1

buy 20.00\$

View Details



Purchased

Planify

Planify Project

@ by @FLOWAPI_US

♡ 1

View



Laptops

latpops

@ by @FLOWAPI_USER

View Details

My Keys 1

Planify



Wp5J+BgUubCcEK1GzgxduV6J...



Books

sadasd

@ by @amrobadhan

♡ 0

buy 33.00\$

View Details



School

School System

@ by @asemdiab

♡ 0

buy 35.00\$

View Details

Purchase Marketplace modal



Enter your purchase details

Payment Method

VISA 4242

Save with link

Buy Now





Purchase Successful!

Your purchase has been processed successfully.

Your API Key:

```
qPhrxD1aeTCVrZo1JXPPamvxSNBZpmqq34  
zYMaQh3sY=
```

Done

Search by API name, category, or developer

Tags

all

Price

All

Free

Paid

Sort

Popular



Purchased

Hello world

endpoint for return Hello world

by @asemDiab

3

View Details

My Keys 1

Hello world



H01kj2qcxpamUc0As2v5l+zZ...



API groups

Folders to organize your API endpoints

📁 Hello world

API Group



👁️ View

- Endpoints

📁 as

API Group



👁️ View

aa

- Endpoints



Search endpoints...

GET 48096072-d7eb-4473-42b7-08de565c30f6/helloWorld

endpoint

Request Response

GET /helloWorld 7c

URL
http://localhost:3000/48096072-d7eb-4473-42b7-08de565c30f6/helloWorld

GET /addTwoNumbers

endpoint to find a+b which the

GET /multiplyTwoNumbe

an endpoint for multiply a and

GET /getMax e8f1c

endpoint to find max and min

GET /findFactorial

endpoint to find the factorial

GET /findAverage c

avg

Request Headers

```
{  
  "Content-Type": "application/json",  
  "x-api-key": "<YOUR_API_KEY>"  
}
```

Request Body

```
[]

Close


```

authorization		



Asem Diab



Display Name

Asem Diab

Edit

Username

asemDiab

Edit

Email

*****@gmail.com ✓ Verified [Reveal](#)

Edit

Password

***** [Reveal](#)

Edit

Stripe ID

Not set

Add

Team Collaboration



Project Team

Book API

Book API ▾

Manage the members who have access to this project.

✉ Invite Team Member

Send an invitation email to someone you'd like to collaborate with on this project.

✉ s12113636@stu.najah.edu

➤ Send Invite

👤 Team Members (0)



No team members yet.





FlowAPI Team <badran.amr2003@gmail.com>

to me

7:04 PM (0 minutes ago)



Team Invitation

You've been invited!

Hi there,

Asem Diab has invited you to join the team for **Book API** on FlowAPI.

Click the button below to accept the invitation:

Accept Invitation

Or copy and paste this link into your browser:

<http://localhost:5173/accept/invitation/7McvhasnQF1erOtwi8OPhwPRz0nTXik9IGSpX11ETI>

Note: This invitation will expire in 48 hours.



Team Invitation

Asem Diab has invited you to join the team
for **Book API**.

INVITED EMAIL

s12113636@stu.najah.edu

Accept Invitation →

Decline



Project Team

Library

Manage the members who have access to this project.

Invite Team Member

Send an invitation email to someone you'd like to collaborate with on this project.

colleague@example.com

Team Members (0)



No team members yet.

Notifications



You have been removed from the project 'School' by the owner
School
23 hours ago

You have been invited to collaborate on the project 'School' by Asem Diab
School
23 hours ago

You have left the project 'School'
School
23 hours ago



Project Team

Book API

Book API ▾

Manage the members who have access to this project.

Only the project owner can invite members.

Team Members (1)



Amr Badran

✉ s12113636@stu.najah.edu

Member

Joined 1/26/2026

Danger Zone

Logout

Sign out of your account

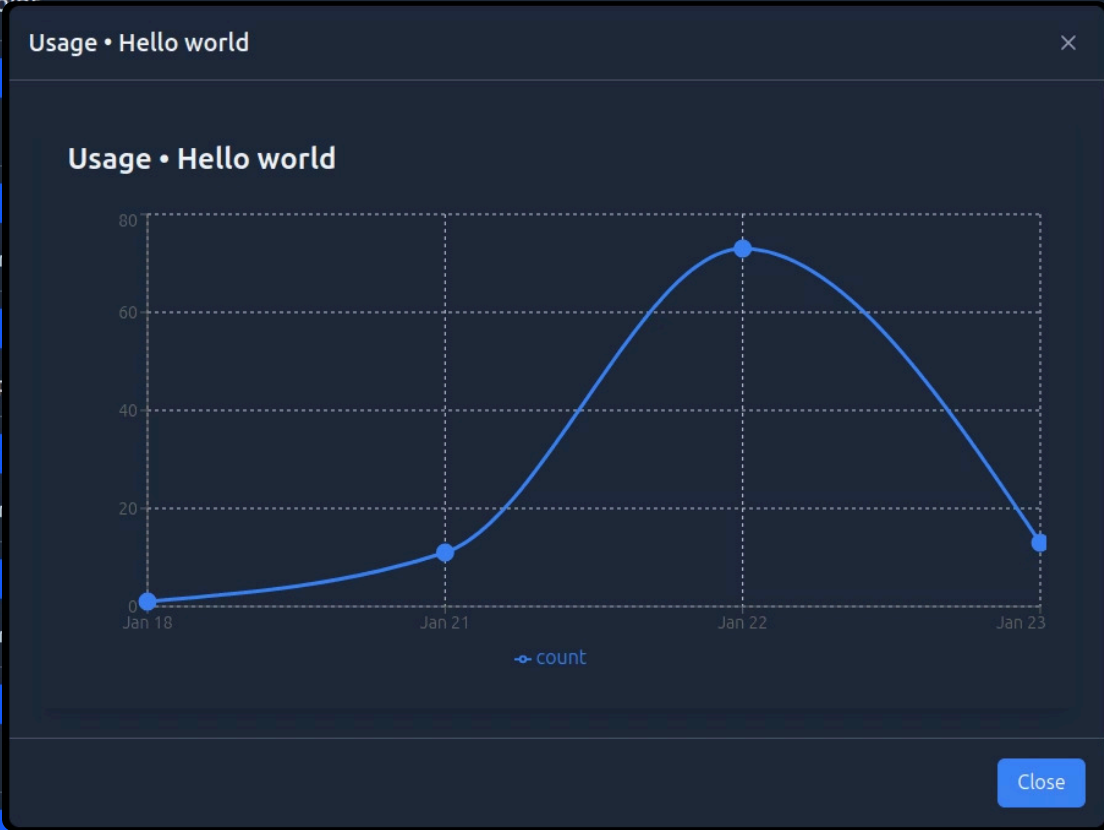
[\[→ Logout\]](#)



API Usages Charts



Search endpoints...

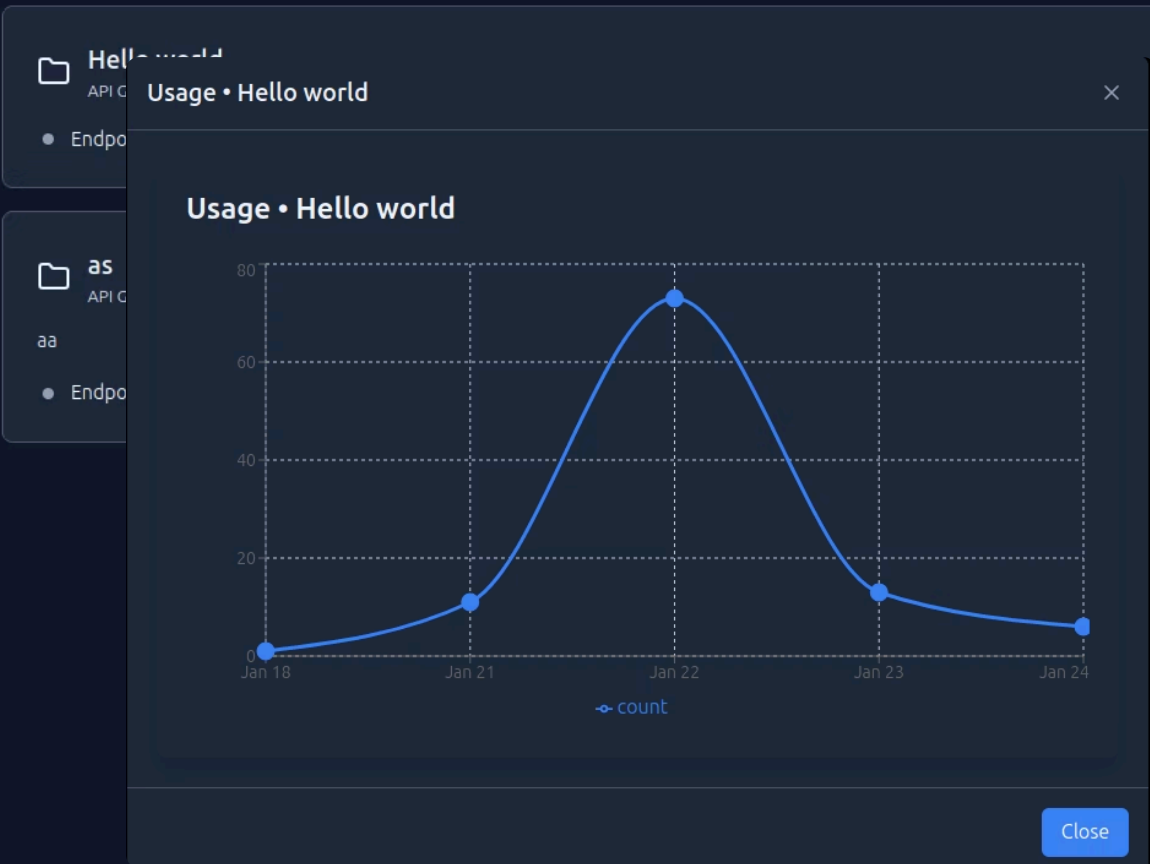


authorization

🔒	ℹ️	📄
🔒	ℹ️	📄
🔒	ℹ️	📄
🔒	ℹ️	📄
🔒	ℹ️	📄
🔒	ℹ️	📄
🔒	ℹ️	📄
🔒	ℹ️	📄

API groups

Tools to organize your API endpoints

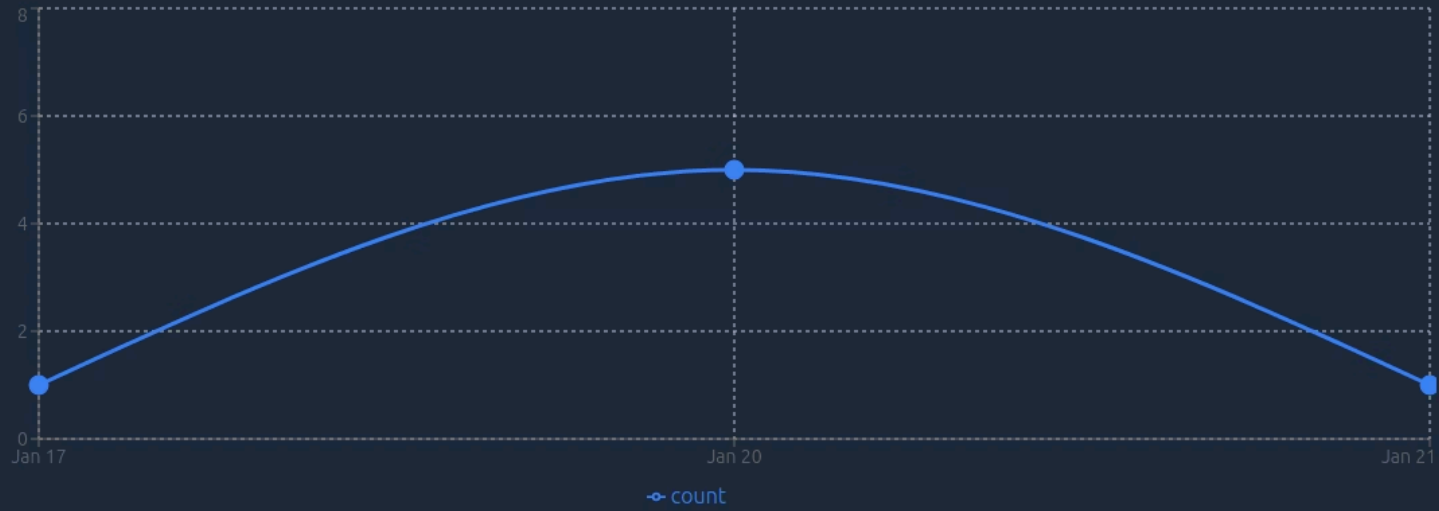


View

View



Daily Count Analytics



Mobile Application





Sign up

First Name

Last Name

Username

Choose a username

Email

your.email@example.com

Password

At least 8 characters

Confirm Password

Retype your password

Sign Up

Already have an account? [Sign In](#)



Login

email or username

password

login

don't have an account? [Sign up](#)

Project #000000

+ Create Project

Number of EndPoints

0

Number of ApiGroup

0

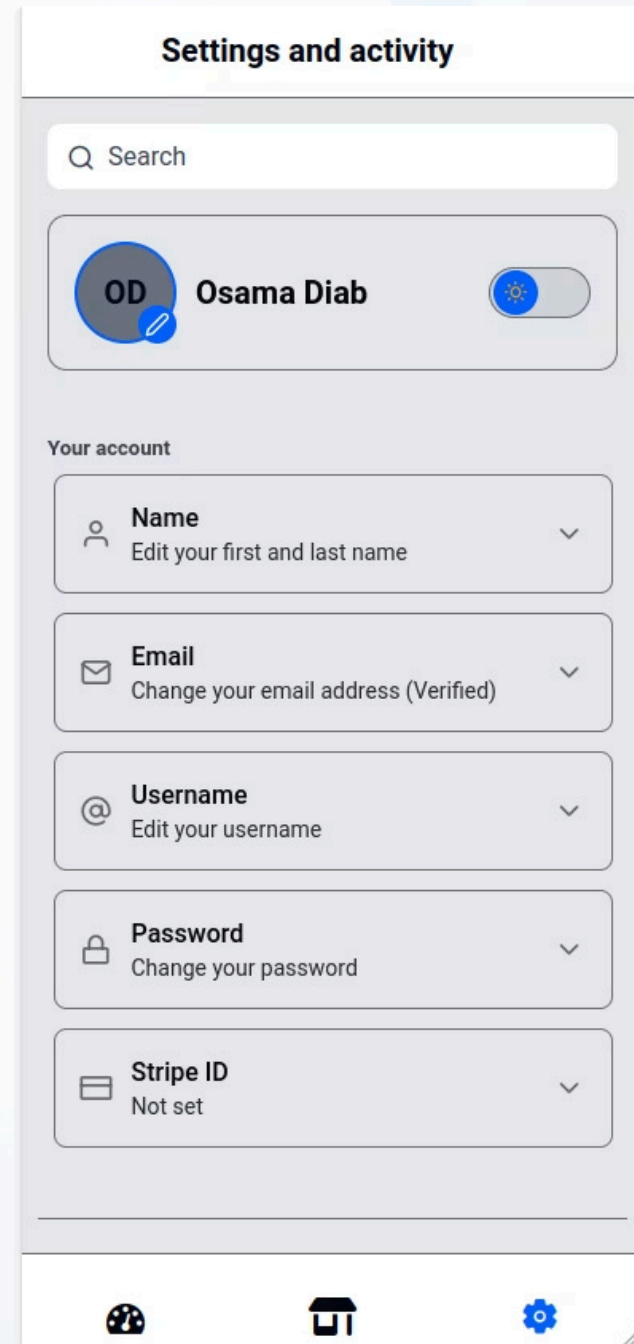
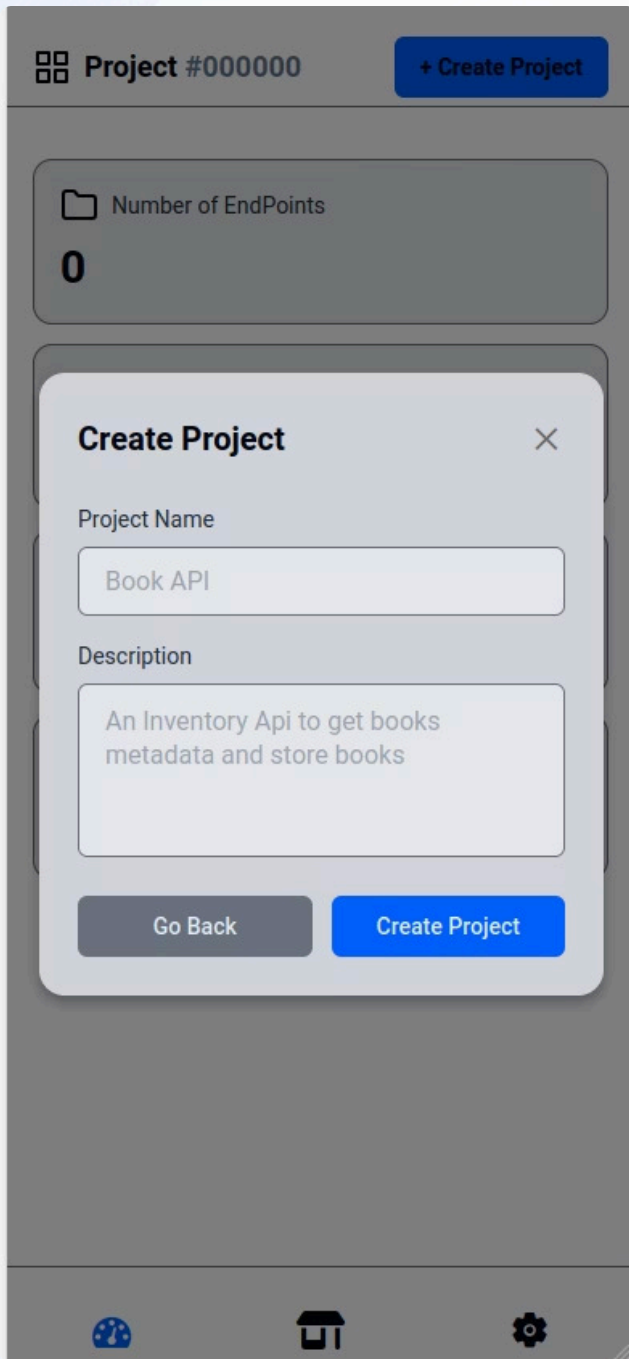
Number of Tables

0

Number of API calls

0





MarketPlace

Search by API name, category, or developer

Tags All Price All Sort Popular

Hello world Purchased

endpoint for return Hello world

by asemDiab 3

[View Details](#)

My Keys 1

API Key 6258b420-88d8-4132-fe90-08de5780bb66

H01kj2qcxp...+dE=

MarketPlace

Create New API Listing

Listing Name *

This will be the name shown in the marketplace. You can modify it from your application name.

Description *

Price (\$) *

Select Application *

No applications found. Please create an application first.

Tags

Add a tag and press Enter

[Cancel](#) [Create Listing](#)

API Groups

Folders to organize your API endpoints

Hello world View

API Group

- Endpoints

as View

API Group

aa

- Endpoints

Hello world Endpoints 000

Search endpoints...

endpoint	authorization
GET /helloWorld 7da...	
GET /addTwoNumber endpoint to find a+b which the user send them via parameters	
GET /multiplyTwoNurr an endpoint for multiply a and b ...	
GET /getMax e8f1db3... endpoint to find max and min from the array	
GET /findFactorial 4... endpoint to find the factorial	
GET /findAverage 6... avg	
GET /math/complex-e complex test	

Limitations & Challenges

As FlowAPI evolves, we acknowledge key limitations and challenges that require continuous focus and innovation.

AI Learning Curve

Training AI models to understand our custom visual blocks and logic rules, ensuring accurate code generation and optimization remains a significant challenge.

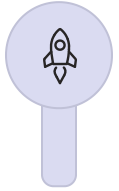
Deployment Costs

Managing and optimizing infrastructure costs for scalable microservices, especially with multi-tenant database setups, presents ongoing financial considerations.

Microservice Integration Complexity

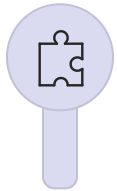
Ensuring seamless and efficient communication and data flow between various independent microservices requires robust design and continuous monitoring.

Future Works & Next Steps



Performance Enhancement

Optimizing microservices for improved response times and greater scalability.



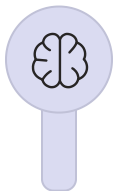
Expand Block Types

Adding new pre-built visual blocks for richer functionality and design flexibility.



External DB Integration

Connecting seamlessly with various external databases like PostgreSQL and MySQL.



Enhanced AI Integration

Further developing AI for intelligent API generation, error detection, and optimization.

✦ A FINAL WORD

Thank You