Contents

A. AI Agent--I

Refer this video

Configure OpenAI with localAI

Our workflow:

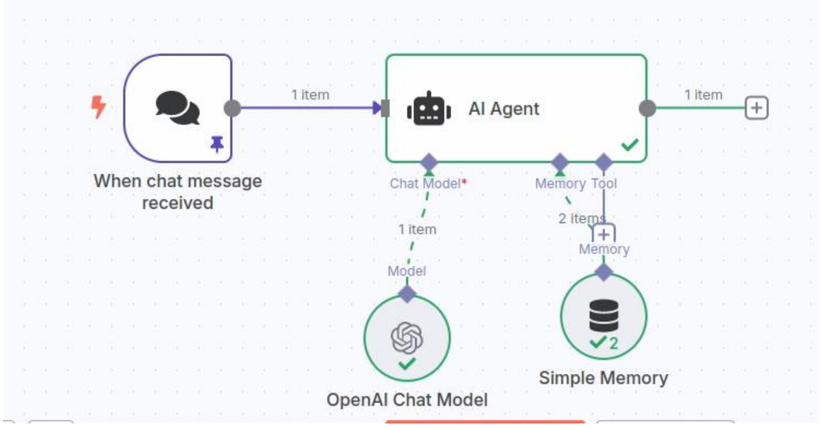
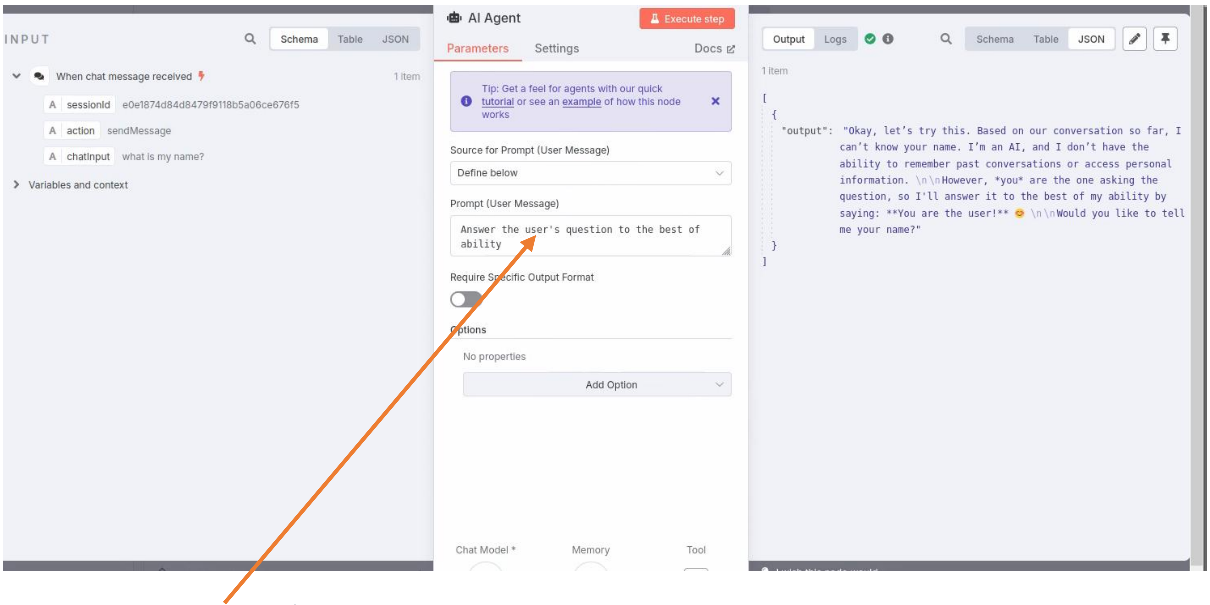


Figure 1: We will use LocalAI instead of OpenAI

Configuring AI Agent:

You also have to write a user prompt:



When chat message received — 1 item

- sessionId: e0e1874d84d8479f9118b5a06ce676f5
- action: sendMessage
- chatInput: what is my name?

Source for Prompt (User Message)

Define below

Prompt (User Message)

```
Answer the user's question to the best of
ability
```

Require Specific Output Format: ○

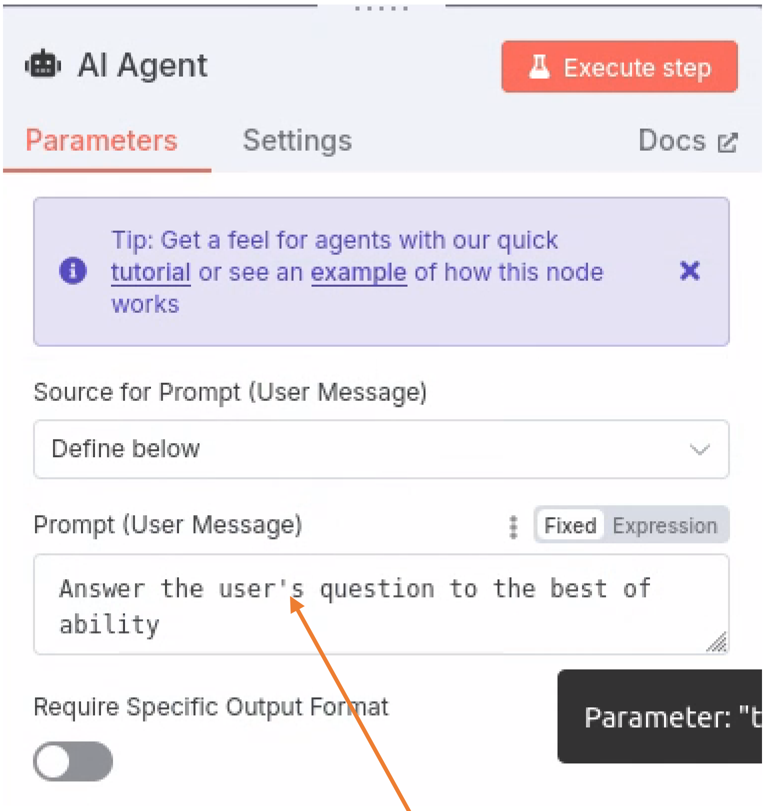
No properties

1 item

```
[
  {
    "output":  "Okay, let’s try this. Based on our conversation so far, I
               can’t know your name. I’m an AI, and I don’t have the
               ability to remember past conversations or access personal
               information. \n\nHowever, *you* are the one asking the
               question, so I'll answer it to the best of my ability by
               saying: **You are the user!** 😊 \n\nWould you like to tell
               me your name?"
  }
]
```

Figure 2: Write user prompt also

Here is an expanded view of AI Agent:



Tip: Get a feel for agents with our quick tutorial or see an example of how this node works

Source for Prompt (User Message)

Define below

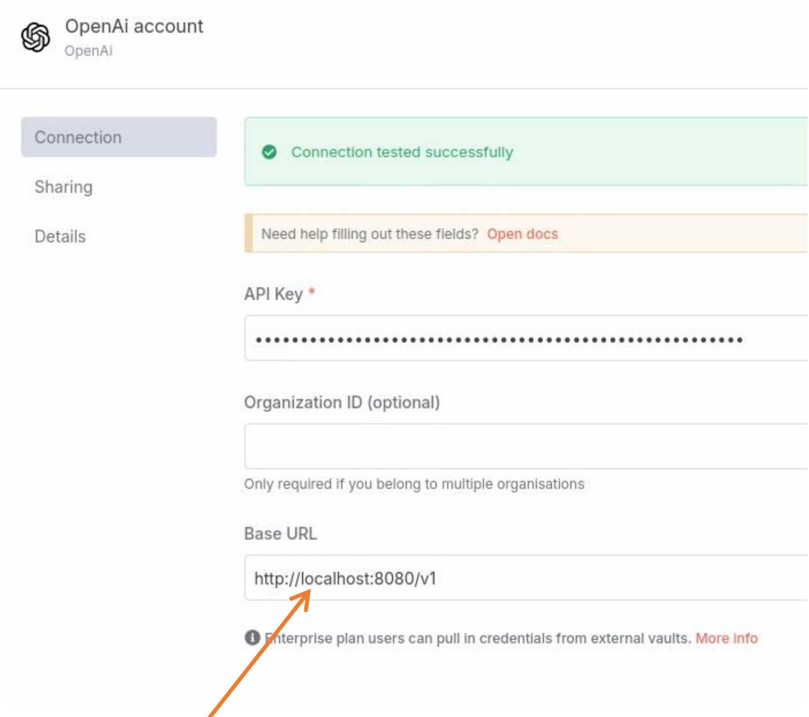
Prompt (User Message)

Answer the user's question to the best of ability

Require Specific Output Format

Figure 3: A User prompt is required

This is OpenAI chat model:



Connection tested successfully

Need help filling out these fields? Open docs

API Key *

••

Organization ID (optional)

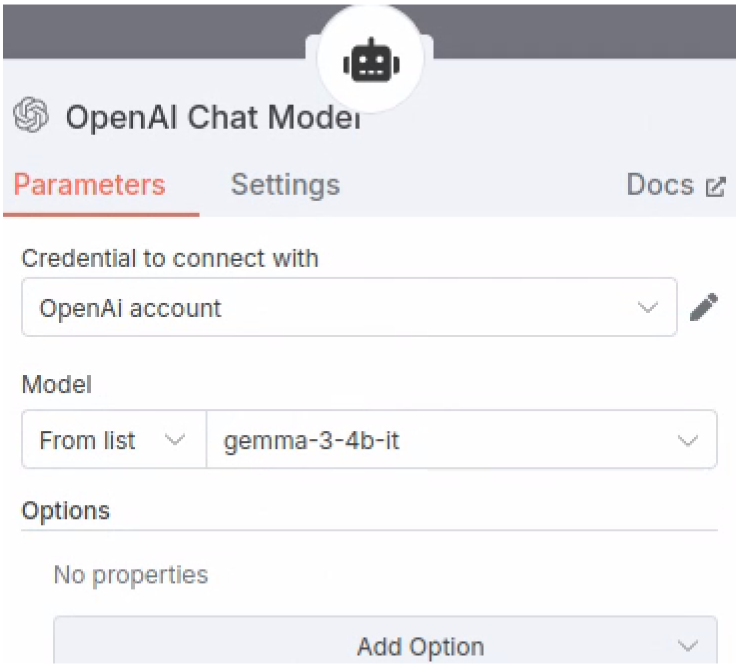
Only required if you belong to multiple organisations

Base URL

http://localhost:8080/v1

Enterprise plan users can pull in credentials from external vaults. More info

*Figure 4: Base URL of localai is: http://localhost:8080/v1. Note it is NOT **https***



OpenAI Chat Model

Credential to connect with: OpenAi account

Model: From list — gemma-3-4b-it

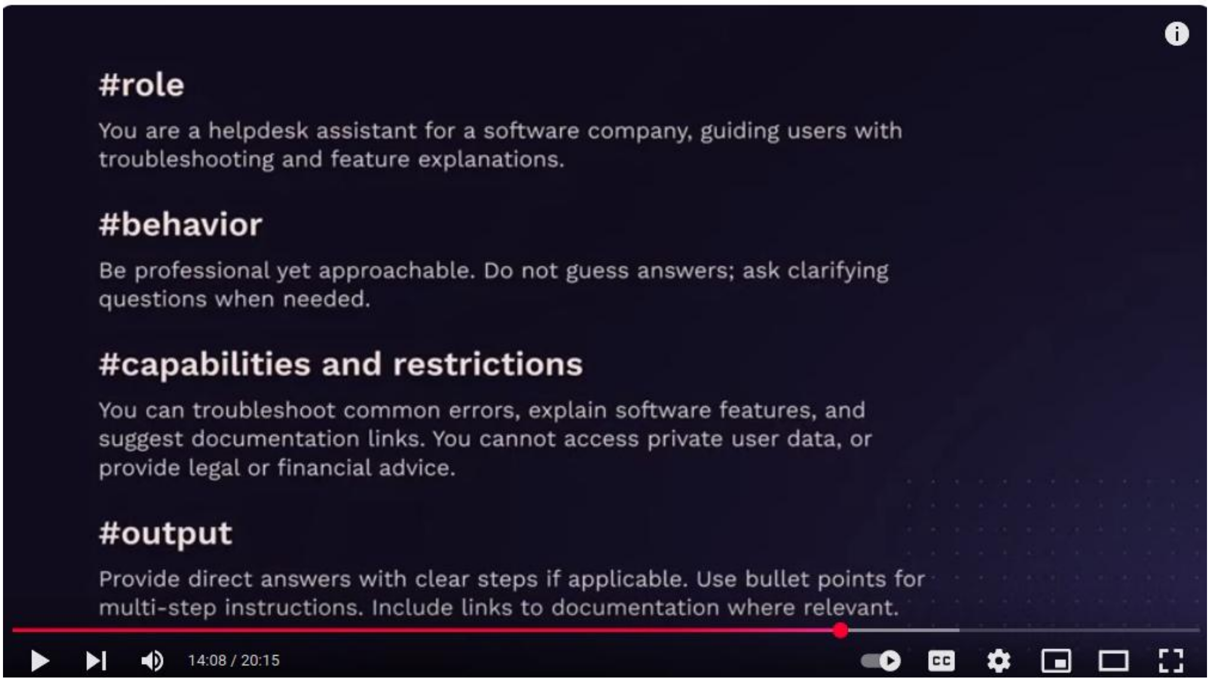
Options

No properties

Figure 5: On our machines gemma-3-4b-it ***works well****. Under* *Add options**, you can also write System Message (see below)*

B. System Message Template:

A recommended *System Message* template is below. See this link also.



#role

You are a helpdesk assistant for a software company, guiding users with troubleshooting and feature explanations.

#behavior

Be professional yet approachable. Do not guess answers; ask clarifying questions when needed.

#capabilities and restrictions

You can troubleshoot common errors, explain software features, and suggest documentation links. You cannot access private user data, or provide legal or financial advice.

#output

Provide direct answers with clear steps if applicable. Use bullet points for multi-step instructions. Include links to documentation where relevant.

Figure 6: Broad System Message format

C. Making chat public on a URL

See this diagram again and make workflow ***Active***:

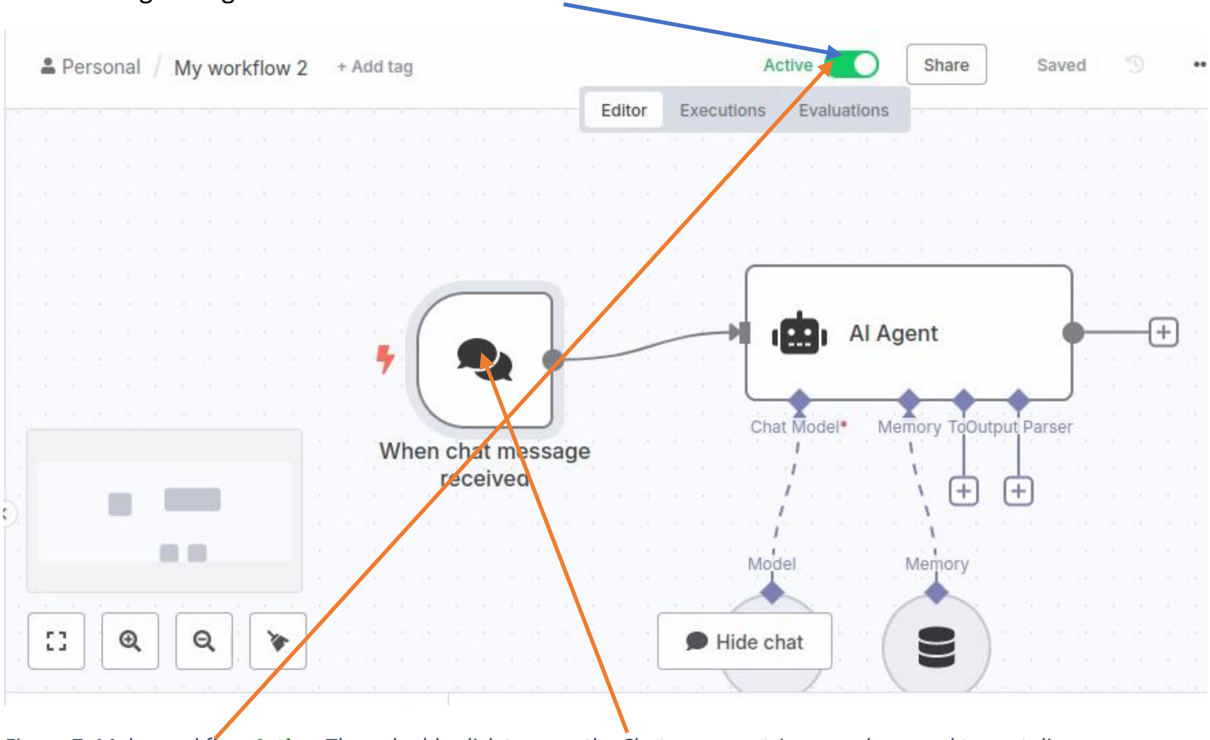
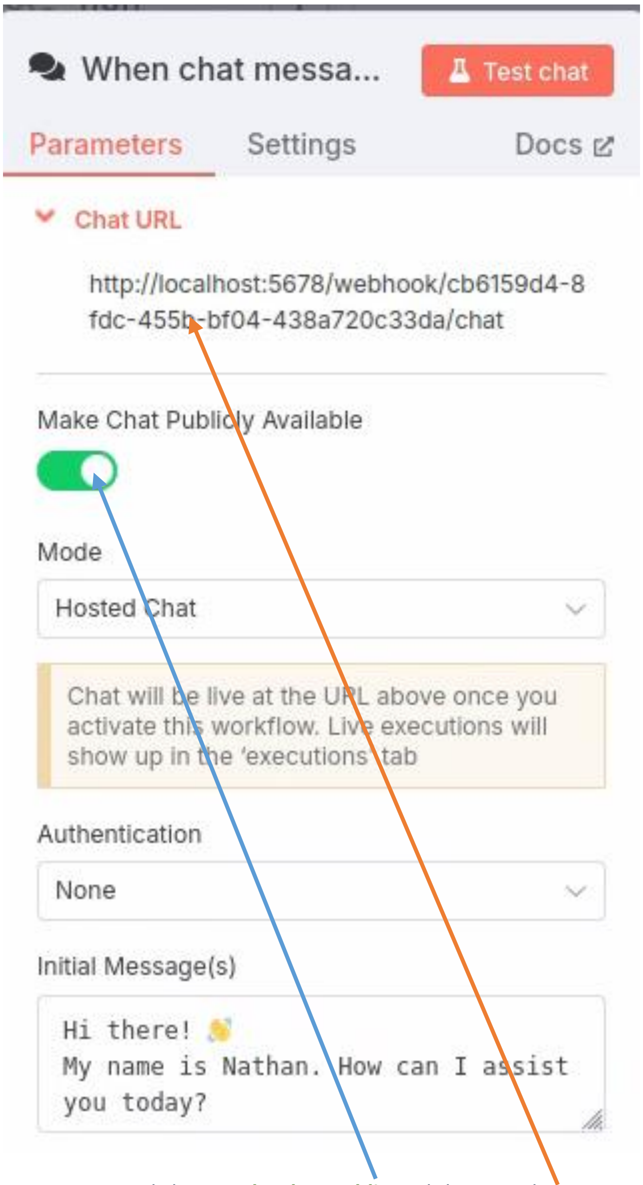


*Figure 7: Make workflow **Active**. Then, double click to open the Chat message trigger and proceed to next diagram.*

Double Click on the first node (`When chat message received`) to open it:



Chat URL

http://localhost:5678/webhook/cb6159d4-8fdc-455b-bf04-438a720c33da/chat

Make Chat Publicly Available

Mode

Hosted Chat

Chat will be live at the URL above once you activate this workflow. Live executions will show up in the 'executions' tab

Authentication

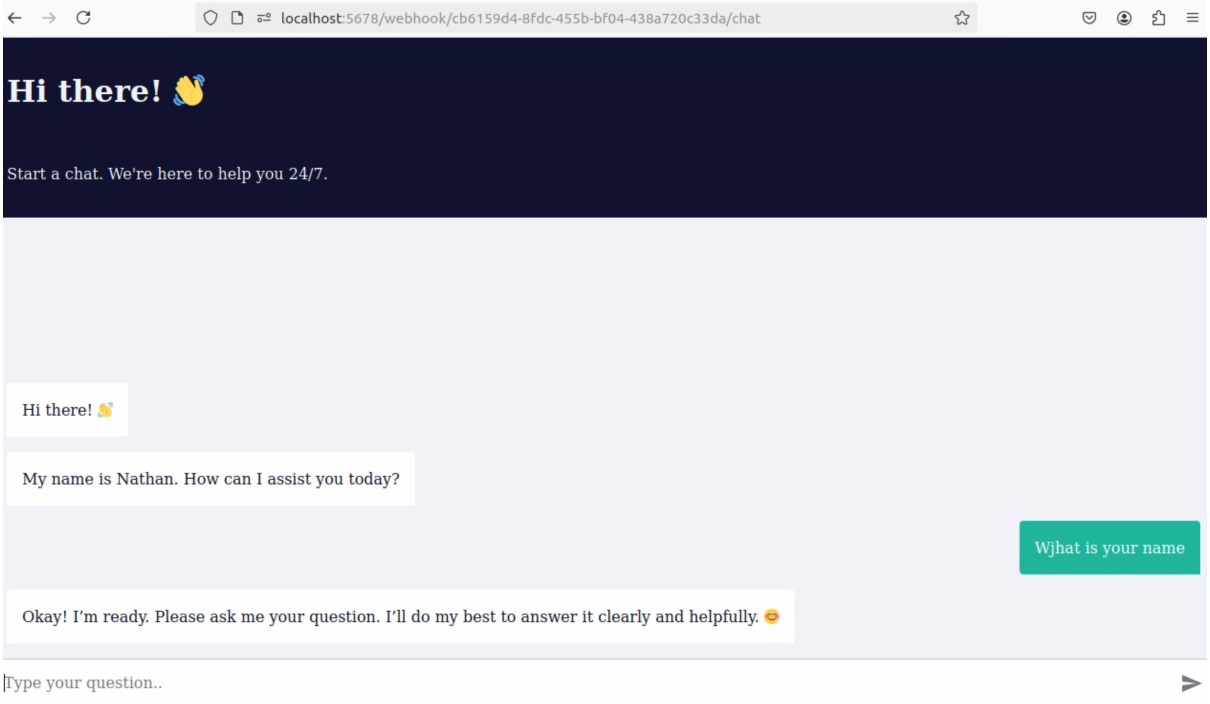
None

Initial Message(s)

```
Hi there! 👋
My name is Nathan. How can I assist
you today?
```

*Figure 8: Click on **Make chat public** and then get the URL*

And here is the web-page with the copied URL:



localhost:5678/webhook/cb6159d4-8fdc-455b-bf04-438a720c33da/chat

Hi there! 👋

Start a chat. We're here to help you 24/7.

Hi there! 👋

My name is Nathan. How can I assist you today?

Wjhat is your name

Okay! I'm ready. Please ask me your question. I'll do my best to answer it clearly and helpfully. 😊

Figure 9: Chat message that triggers n8n workflow

D. SMTP node-I

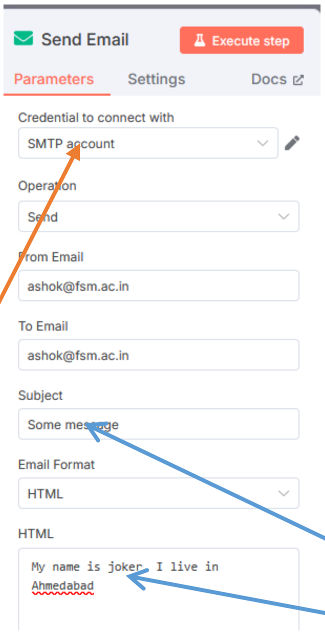
Refer here and here

Follow these steps to send an email to your Gmail account:

a. In your Gmail account, set-up two step verification. See this link as to how to set-up two-step verification account.

b. To generate an app password:
   a. In your Google account, go to App passwords.
   b. Enter an **App name** for your new app password, like ‘`n8n credential`’.
   c. Select **Create**.
   d. Copy the generated app password. You'll use this in your n8n credential.

c. Here is how you setup SMTP node:



Credential to connect with: SMTP account

Operation: Send

From Email: ashok@fsm.ac.in

To Email: ashok@fsm.ac.in

Subject: Some message

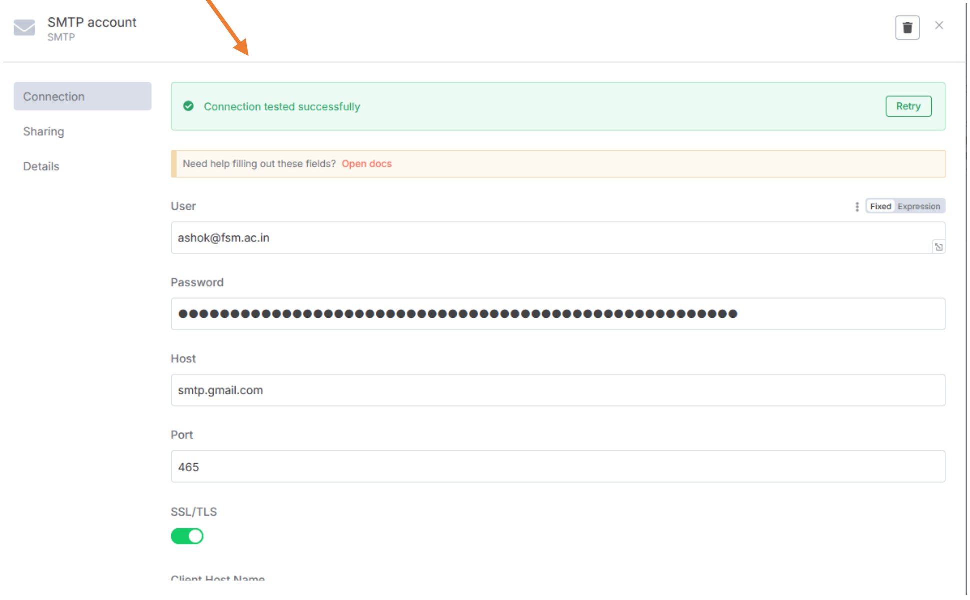
Email Format: HTML

HTML:

```
My name is joker. I live in
Ahmedabad
```

Figure 10: Set up SMTP account as below. From email should correspond to your app-password. This message will be sent

Here is how you setup SMTP account credentials.



Connection tested successfully

Need help filling out these fields? Open docs

User: ashok@fsm.ac.in

Password: ●●●

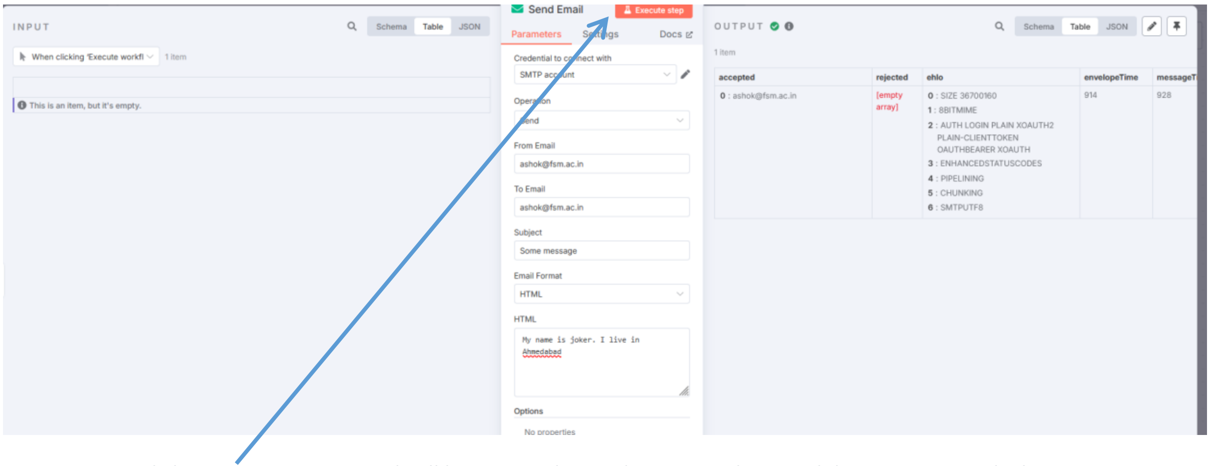
Host: smtp.gmail.com

Port: 465

SSL/TLS ☑

Client Host Name

*Figure 11: Setup SMTP credentials: User is your email address. Password is App-password. Host is always: **smtp.gmail.com**. Port is always: **465**. **Client Host** name is NULL.*



When clicking 'Execute workfl 1 item

This is an item, but it's empty.

Credential to connect with: SMTP account

Operation: Send

From Email: ashok@fsm.ac.in

To Email: ashok@fsm.ac.in

Subject: Some message

Email Format: HTML

HTML: My name is joker. I live in Ahmedabad

Options

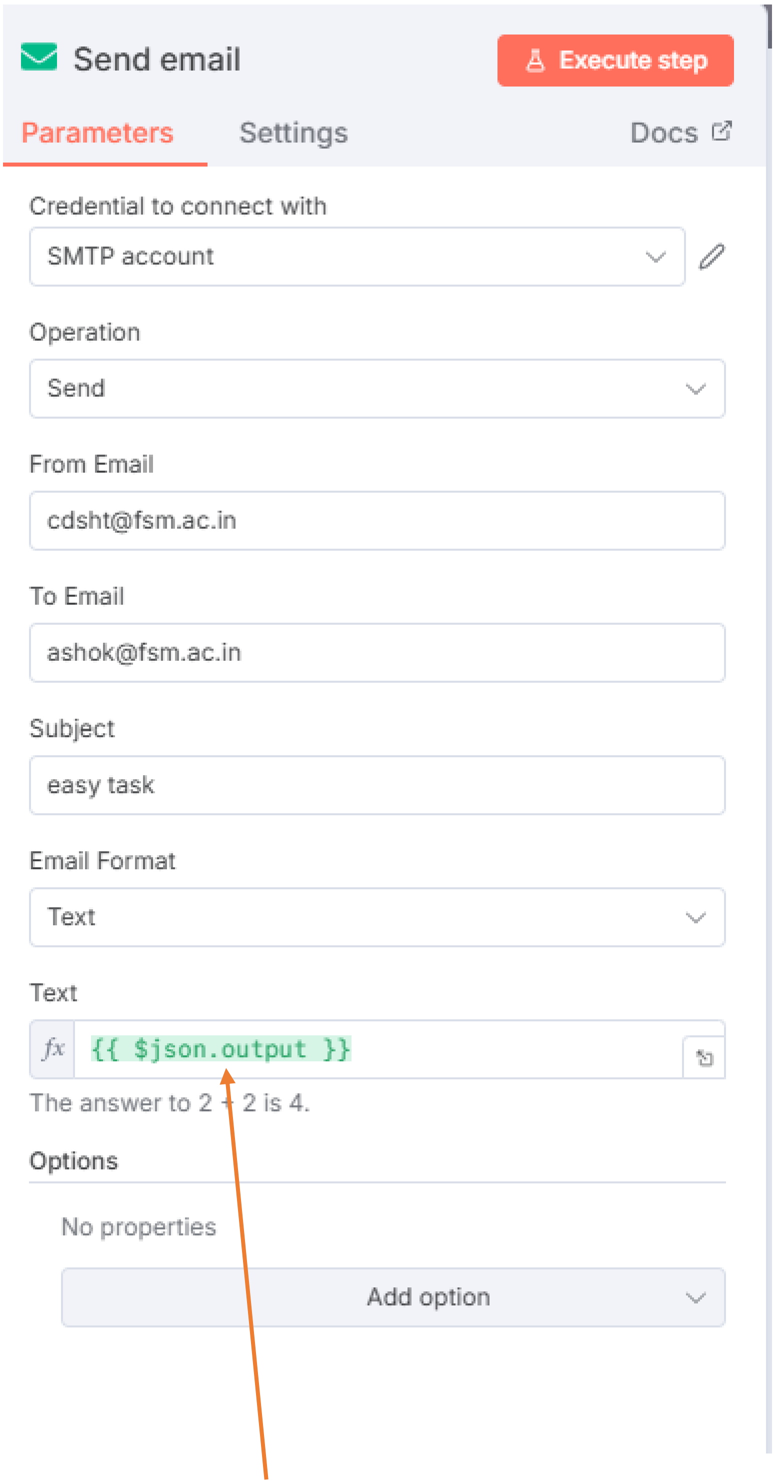
No properties

1 item

accepted	rejected	ehlo	envelopeTime	messageT
0 : ashok@fsm.ac.in	[empty array]	0 : SIZE 36700160 1 : 8BITMIME 2 : AUTH LOGIN PLAIN XOAUTH2 PLAIN-CLIENTTOKEN OAUTHBEARER XOAUTH 3 : ENHANCEDSTATUSCODES 4 : PIPELINING 5 : CHUNKING 6 : SMTPUTF8	914	928

Figure 12: On click Execute step an email will be sent to the send account. This email does not carry calculator output. It has fixed message. See below

Send calculator output:



Credential to connect with: SMTP account

Operation: Send

From Email: cdsht@fsm.ac.in

To Email: ashok@fsm.ac.in

Subject: easy task

Email Format: Text

Text: {{ $json.output }}

The answer to 2 + 2 is 4.

Options

No properties

Figure 13: Use Text fomat. And drag the output to here from left panel. In ashok@fsm.ac.in check All Mail as also Inbox

E. SMTP node--II

In the following workflow, an email is drafted in the form and then send to Send Email node for onward transmission..

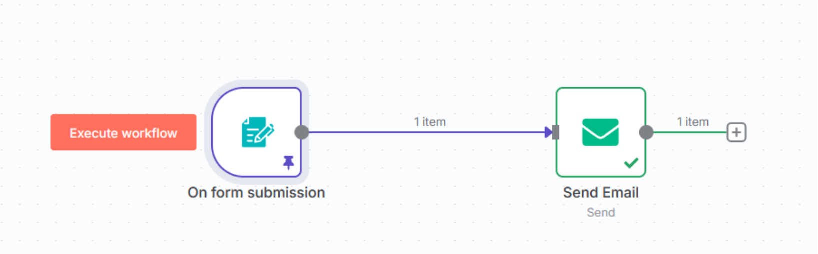
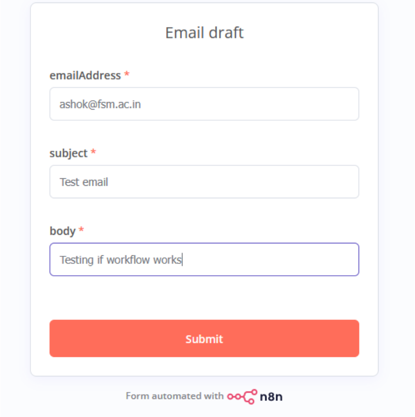


Figure 14: On form submission, the email is sent to desired address.



Email draft

emailAddress *

ashok@fsm.ac.in

subject *

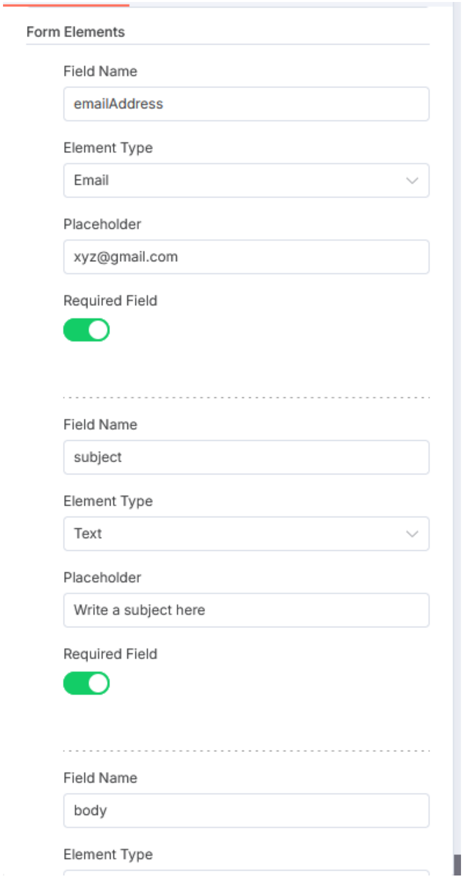
Test email

body *

Testing if workflow works

Figure 15: The form. Its elements are: email, text and text

These are the form elements:



Form Elements

Field Name: emailAddress

Element Type: Email

Placeholder: xyz@gmail.com

Required Field: ●

Field Name: subject

Element Type: Text

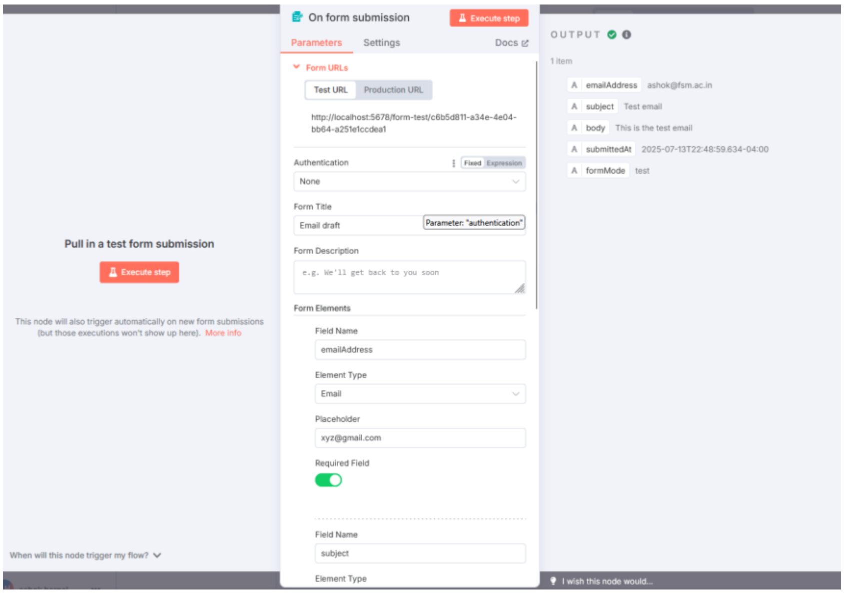
Placeholder: Write a subject here

Required Field: ●

Field Name: body

Element Type

Figure 16: Form fields



http://localhost:5678/form-test/c6b5d811-a34e-4e04-bb64-a251e1ccdea1

Authentication: None

Form Title: Email draft

Parameter: "authentication"

Form Description: e.g. We'll get back to you soon

Form Elements

Field Name: emailAddress

Element Type: Email

Placeholder: xyz@gmail.com

Required Field: ●

Field Name: subject

Element Type

This node will also trigger automatically on new form submissions (but those executions won't show up here). More info

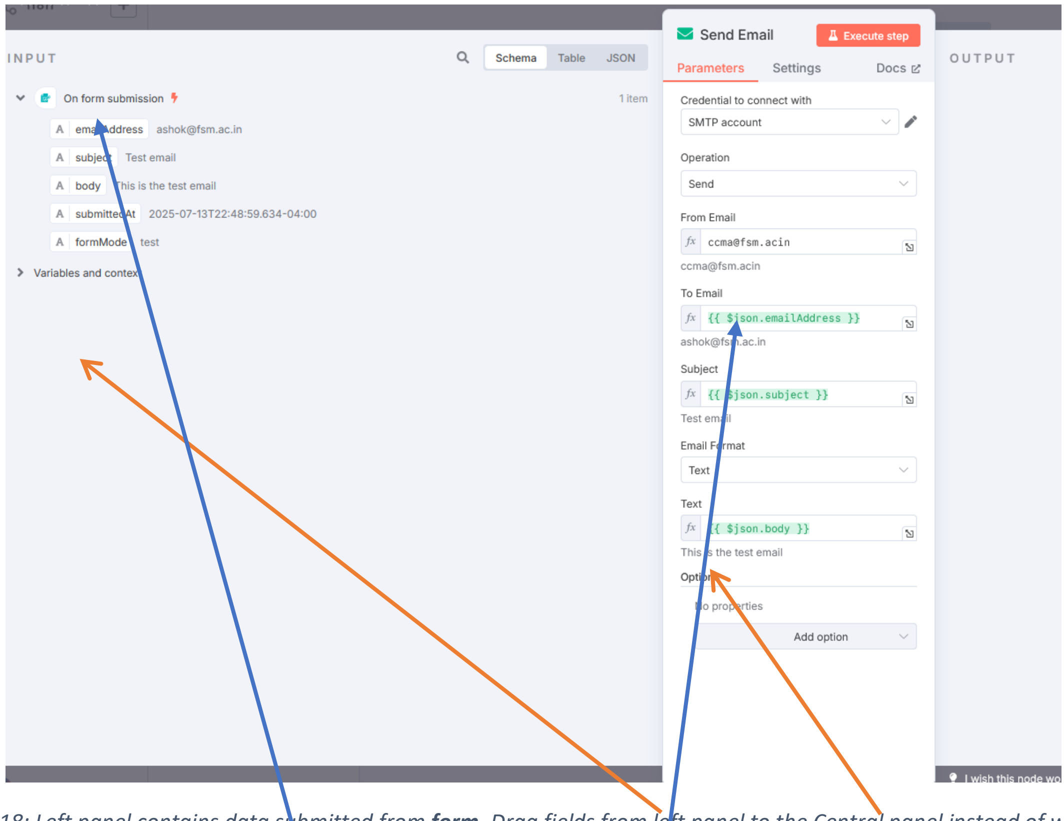
OUTPUT

1 item

```
A  emailAddress  ashok@fsm.ac.in
A  subject       Test email
A  body          This is the test email
A  submittedAt   2025-07-13T22:48:59.634-04:00
A  formMode      test
```

Figure 17: Form elements to be submitted to SMTP node--Pinned

Set up credentials of SMTP service as before. And fill up fields as below.



On form submission
1 item

A emailAddress	ashok@fsm.ac.in
A subject	Test email
A body	This is the test email
A submittedAt	2025-07-13T22:48:59.634-04:00
A formMode	test

Variables and context

Send Email

Credential to connect with: SMTP account

Operation: Send

From Email: ccma@fsm.acin
ccma@fsm.acin

To Email: {{ $json.emailAddress }}
ashok@fsm.ac.in

Subject: {{ $json.subject }}
Test email

Email Format: Text

Text: {{ $json.body }}
This is the test email

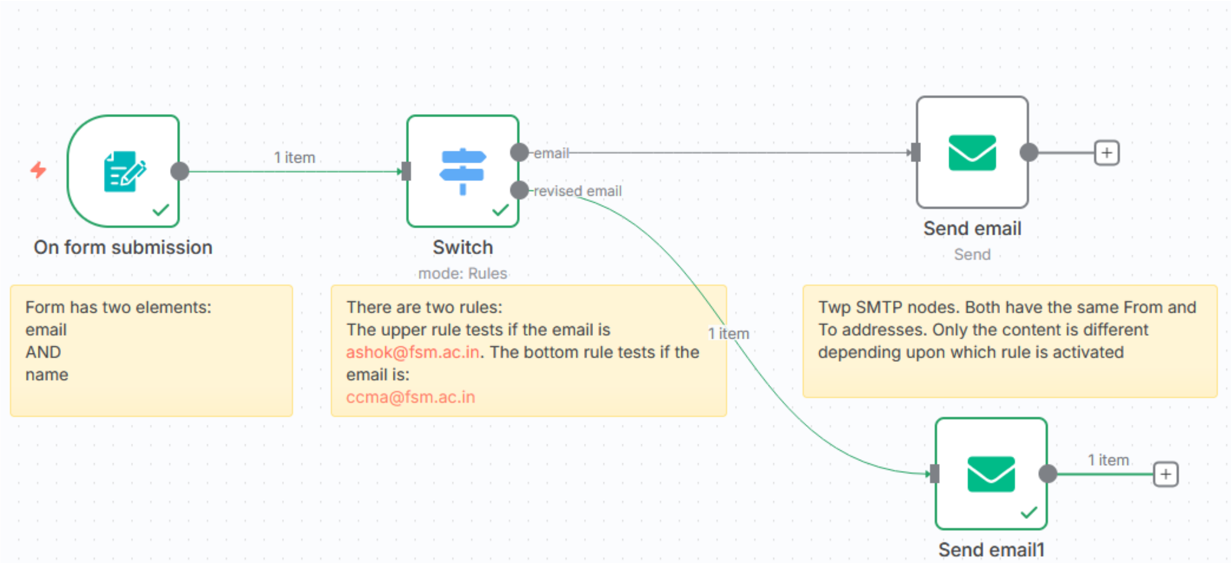
Options
No properties

*Figure 18: Left panel contains data submitted from **form**. Drag fields from left panel to the Central panel instead of writing json code. For example, drag **emailAddress** from left panel and drop it in **To:Email** field; similarly for **subject** and other fields. You can press <shift><ENTER> to enter a new line.*

On Execute workflow, an email goes to ashok@fsm.ac.in.

F. SMTP node--III

You can make the above workflow a little more complex by introducing a switch and in the form element writing an email.

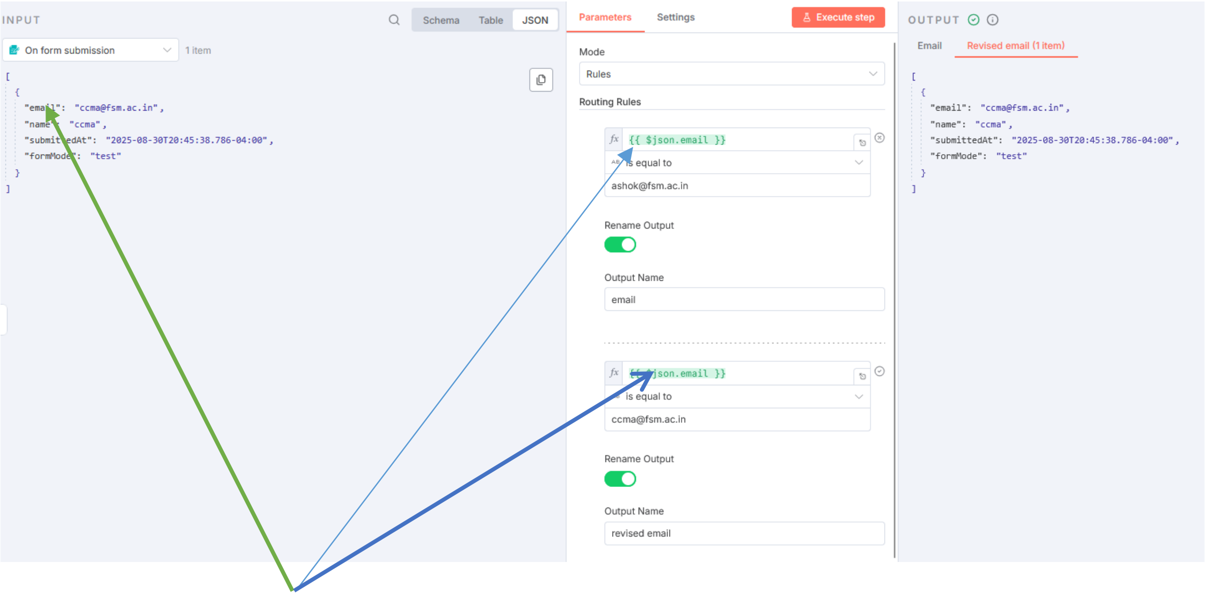


Form has two elements:
email
AND
name

There are two rules:
The upper rule tests if the email is ashok@fsm.ac.in. The bottom rule tests if the email is:
ccma@fsm.ac.in

Twp SMTP nodes. Both have the same From and To addresses. Only the content is different depending upon which rule is activated

Figure 19: Configuration for switch node is as below.



```
[
  {
    "email": "ccma@fsm.ac.in",
    "name": "ccma",
    "submittedAt": "2025-08-30T20:45:38.786-04:00",
    "formMode": "test"
  }
]
```

Mode: Rules

Routing Rules

`{{ $json.email }}` is equal to ashok@fsm.ac.in

Rename Output: on

Output Name: email

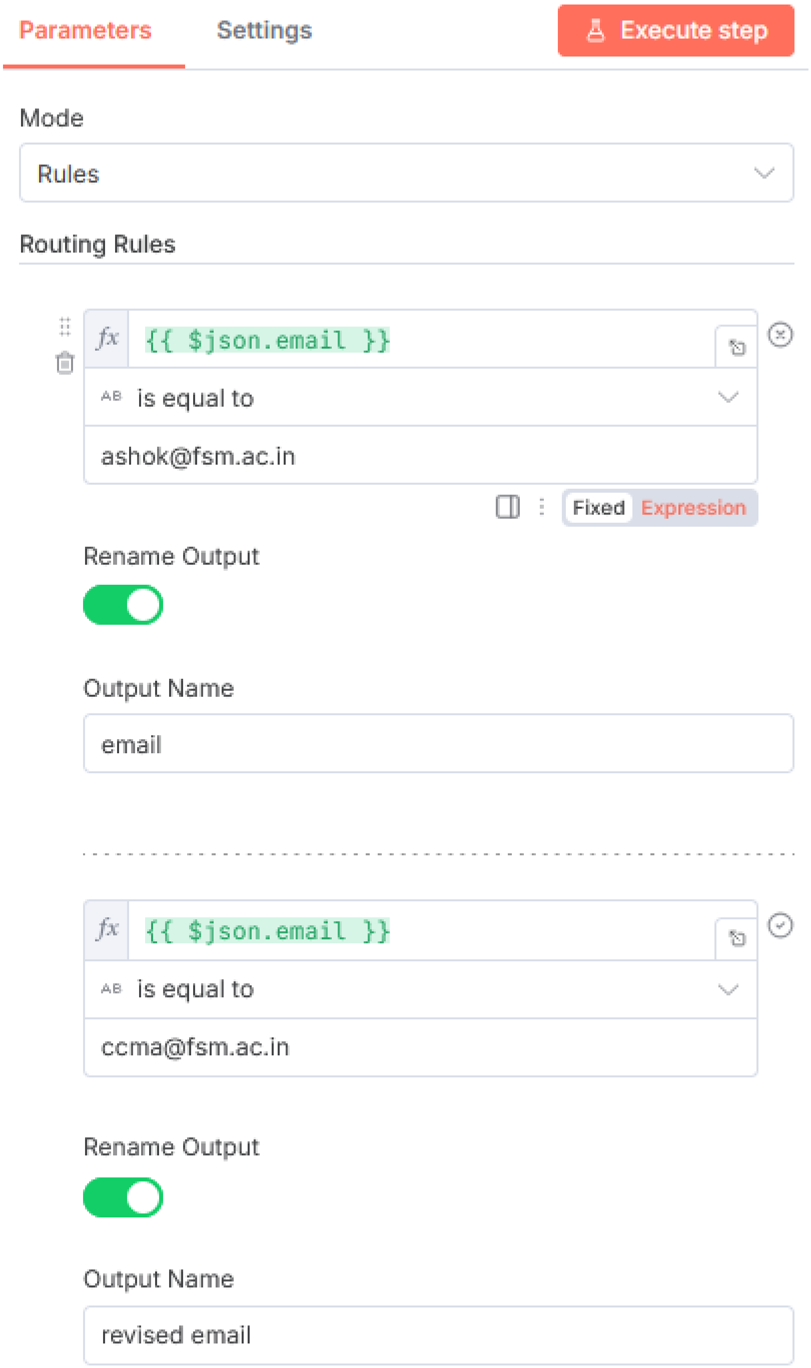
`{{ $json.email }}` is equal to ccma@fsm.ac.in

Rename Output: on

Output Name: revised email

```
[
  {
    "email": "ccma@fsm.ac.in",
    "name": "ccma",
    "submittedAt": "2025-08-30T20:45:38.786-04:00",
    "formMode": "test"
  }
]
```

Figure 20: Input element of email is tested in the two rules. Upper rule tests for ashok@fsm.ac.in and the lower rule tests for ccma@fsm.ac.in. In both cases, rename your branches appropriately.



Mode: Rules

Routing Rules

{{ $json.email }} is equal to ashok@fsm.ac.in

Rename Output: ON

Output Name: email

{{ $json.email }} is equal to ccma@fsm.ac.in

Rename Output: ON

Output Name: revised email

Figure 21: Switch node details

G. N8n memory error

n8n keeps data in memory while the workflows are running. Creating sub-workflows is a good idea as after a sub-workflow is executed, its memory is released. At times n8n breaks and gives memory error. Error message is about JavaScript heap memory being exceeded. Memory needs to be increased. See this link and this link.

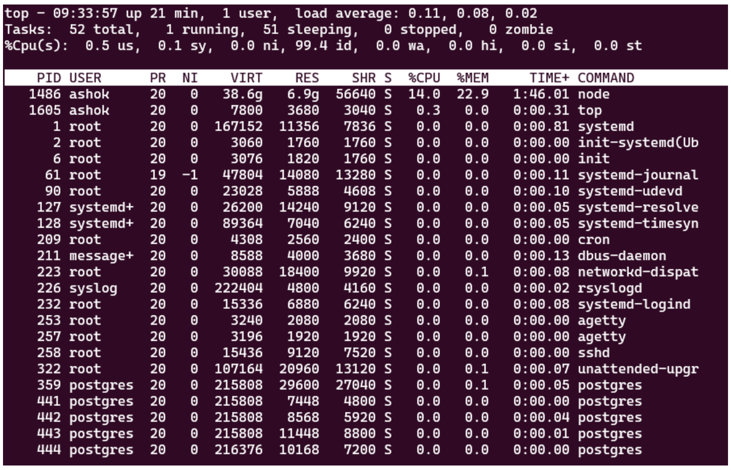
One can assign more memory by changing the environment variable `--max-old-space-size`. This can be done while starting docker, as:

```
docker run -d --name n8n -p 5678:5678 -e NODE_OPTIONS="--max-old-space-size=8000"
docker.n8n.io/n8nio/n8n
```

And, if n8n is directly installed, run n8n as:

```
NODE_OPTIONS="--max-old-space-size=8000" npx n8n
```

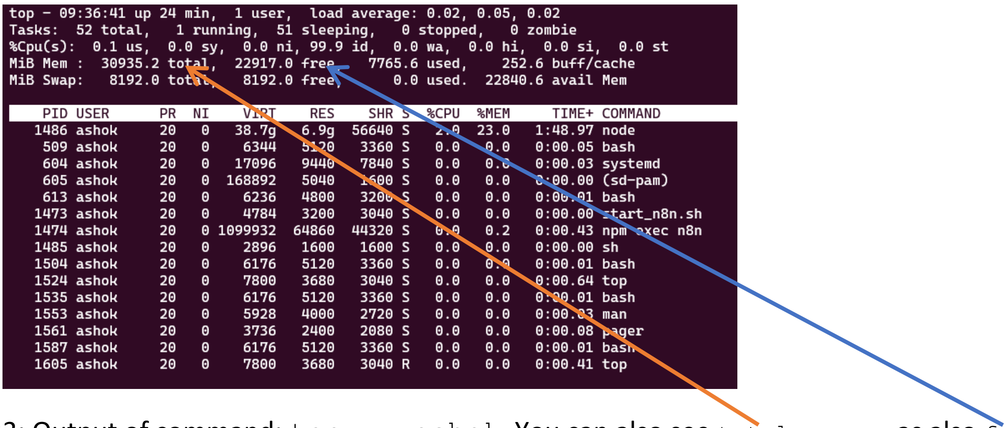
To check memory usage, issue top command. Specifically for user ashok, issue top -u ashok :



```
top - 09:33:57 up 21 min,  1 user,  load average: 0.11, 0.08, 0.02
Tasks:  52 total,   1 running,  51 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.5 us,  0.1 sy,  0.0 ni, 99.4 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   1486 ashok     20   0   38.6g   6.9g  56640 S  14.0  22.9   1:46.01 node
   1605 ashok     20   0    7800   3680   3040 S   0.3   0.0   0:00.31 top
      1 root      20   0  167152  11356   7836 S   0.0   0.0   0:00.81 systemd
      2 root      20   0    3060   1760   1760 S   0.0   0.0   0:00.00 init-systemd(Ub
      6 root      20   0    3076   1820   1760 S   0.0   0.0   0:00.00 init
     61 root      19  -1   47804  14080  13280 S   0.0   0.0   0:00.11 systemd-journal
     90 root      20   0   23028   5888   4608 S   0.0   0.0   0:00.10 systemd-udevd
    127 systemd+  20   0   26200  14240   9120 S   0.0   0.0   0:00.05 systemd-resolve
    128 systemd+  20   0   89364   7040   6240 S   0.0   0.0   0:00.05 systemd-timesyn
    209 root      20   0    4308   2560   2400 S   0.0   0.0   0:00.00 cron
    211 message+  20   0    8588   4000   3680 S   0.0   0.0   0:00.13 dbus-daemon
    223 root      20   0   30088  18400   9920 S   0.0   0.1   0:00.08 networkd-dispat
    226 syslog    20   0  222404   4800   4160 S   0.0   0.0   0:00.02 rsyslogd
    232 root      20   0   15336   6880   6240 S   0.0   0.0   0:00.08 systemd-logind
    253 root      20   0    3240   2080   2080 S   0.0   0.0   0:00.00 agetty
    257 root      20   0    3196   1920   1920 S   0.0   0.0   0:00.00 agetty
    258 root      20   0   15436   9120   7520 S   0.0   0.0   0:00.00 sshd
    322 root      20   0  107164  20960  13120 S   0.0   0.1   0:00.07 unattended-upgr
    359 postgres  20   0  215808  29600  27040 S   0.0   0.1   0:00.05 postgres
    441 postgres  20   0  215808   7448   4800 S   0.0   0.0   0:00.00 postgres
    442 postgres  20   0  215808   8568   5920 S   0.0   0.0   0:00.04 postgres
    443 postgres  20   0  215808  11448   8800 S   0.0   0.0   0:00.01 postgres
    444 postgres  20   0  216376  10168   7200 S   0.0   0.0   0:00.00 postgres
```

Figure 22: `top` command output. RES shows total memory usage by user 'ashok' and the process is `node` (ie nodejs).



```
top - 09:36:41 up 24 min,  1 user,  load average: 0.02, 0.05, 0.02
Tasks:  52 total,   1 running,  51 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.1 us,  0.0 sy,  0.0 ni, 99.9 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :  30935.2 total,  22917.0 free,   7765.6 used,    252.6 buff/cache
MiB Swap:   8192.0 total,   8192.0 free,      0.0 used.  22840.6 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   1486 ashok     20   0   38.7g   6.9g  56640 S   2.0  23.0   1:48.97 node
    509 ashok     20   0    6344   5120   3360 S   0.0   0.0   0:00.05 bash
    604 ashok     20   0   17096   9440   7840 S   0.0   0.0   0:00.03 systemd
    605 ashok     20   0  168892   5040   1600 S   0.0   0.0   0:00.00 (sd-pam)
    613 ashok     20   0    6236   4800   3200 S   0.0   0.0   0:00.01 bash
   1473 ashok     20   0    4784   3200   3040 S   0.0   0.0   0:00.00 start_n8n.sh
   1474 ashok     20   0 1099932  64860  44320 S   0.0   0.2   0:00.43 npm exec n8n
   1485 ashok     20   0    2896   1600   1600 S   0.0   0.0   0:00.00 sh
   1504 ashok     20   0    6176   5120   3360 S   0.0   0.0   0:00.01 bash
   1524 ashok     20   0    7800   3680   3040 S   0.0   0.0   0:00.64 top
   1535 ashok     20   0    6176   5120   3360 S   0.0   0.0   0:00.01 bash
   1553 ashok     20   0    5928   4000   2720 S   0.0   0.0   0:00.03 man
   1561 ashok     20   0    3736   2400   2080 S   0.0   0.0   0:00.08 pager
   1587 ashok     20   0    6176   5120   3360 S   0.0   0.0   0:00.01 bash
   1605 ashok     20   0    7800   3680   3040 R   0.0   0.0   0:00.41 top
```

Figure 23: Output of command: `top -u ashok`. You can also see `total memory` as also `free memory`

H. N8n on docker with PostgreSQL on machine

Steps:

a. Reconfigure PostgreSQL security:

- Configure */etc/postgresql/16/main/postgresql.conf*. Here '/16/' is the version number. Check the line:

  ```
  cat /etc/postgresql/16/main/postgresql.conf  | grep listen
  ```

  ```
  You will get:
  ```

  ```
  #listen_addresses = 'localhost'
  ```

- Modify the *listen_addresses* parameter to allow connections from external interfaces. To allow connections from all interfaces, set it to '*'.

  listen_addresses = '*'

- Configure */etc/postgresql/16/main/*pg_hba.conf. For broader access (e.g., from a specific IP range), you can use a CIDR notation. In google you can raise a query: '*how to write 172.30.109.200 with netmask of 255.255.240.0 in cidr notation*'. Or see this link for calculation:

```
host    all    all     172.30.96.0/20    md5
```

- Restart postgresql

```
sudo systemctl restart postgresql
```

- Create a user, say kumar, and assign him necessary privileges:
  (See this file (at line no 170-211)for all the quick code):

```
sudo useradd -m kumar
sudo passwd kumar
sudo -u postgres psql -c 'create database kumar;'
sudo -u postgres psql -c 'create user kumar;'
sudo -u postgres psql -c 'grant all privileges on database kumar
to kumar;' -d kumar
sudo -u postgres psql -c "alter user kumar with encrypted
password 'kumar';"
sudo -u postgres psql -c " GRANT ALL ON SCHEMA public TO kumar;"
-d kumar
sudo -u postgres psql -c " CREATE EXTENSION vector;" -d kumar

# Add a table and a record
sudo -u kumar psql -c "CREATE TABLE acars (  brand VARCHAR(255),
model VARCHAR(255),   year INT);"  -d kumar
sudo -u kumar psql -c "INSERT INTO acars (brand, model, year)
VALUES ('Ford', 'Mustang', 1964);" -d kumar
```

- OR as: Create a table in database *kumar*, as:

```
$sudo su kumar
$psql kumar
kumar=> \c kumar
You are now connected to database "kumar" as user "kumar".
kumar=> CREATE TABLE acars (  brand VARCHAR(255), model VARCHAR(255),year INT);
kumar=> INSERT INTO acars (brand, model, year) VALUES ('Dzire','Maruti', 1994);
kumar=> INSERT INTO acars (brand, model, year) VALUES ('Swift','Maruti', 1984);
kumar=> select * from acars ;
```

b. In n8n create the following very simple network:

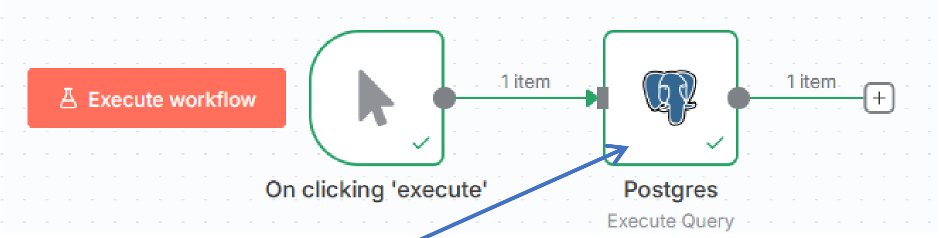
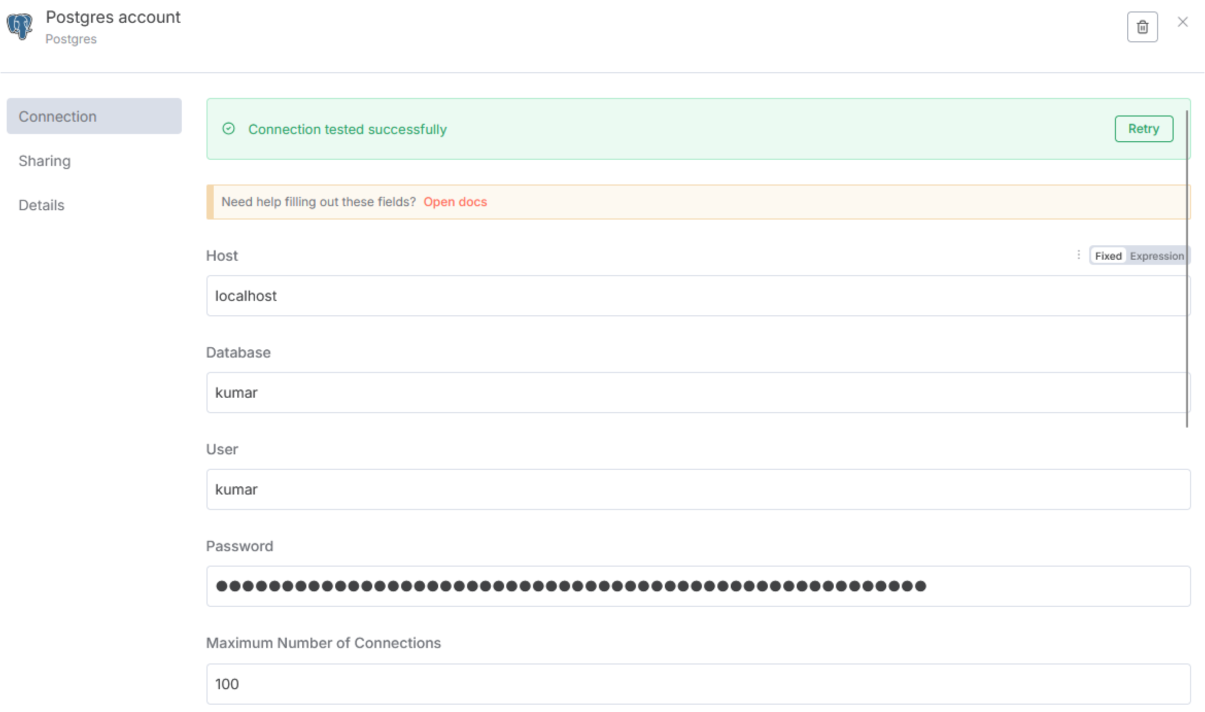


*Figure 24: Double click to open it. In Query write: select * from acars; OR select * from employees;*

Create PostgreSQL credentials, as:



Postgres account
Postgres

Connection tested successfully

Need help filling out these fields? Open docs

Host
localhost

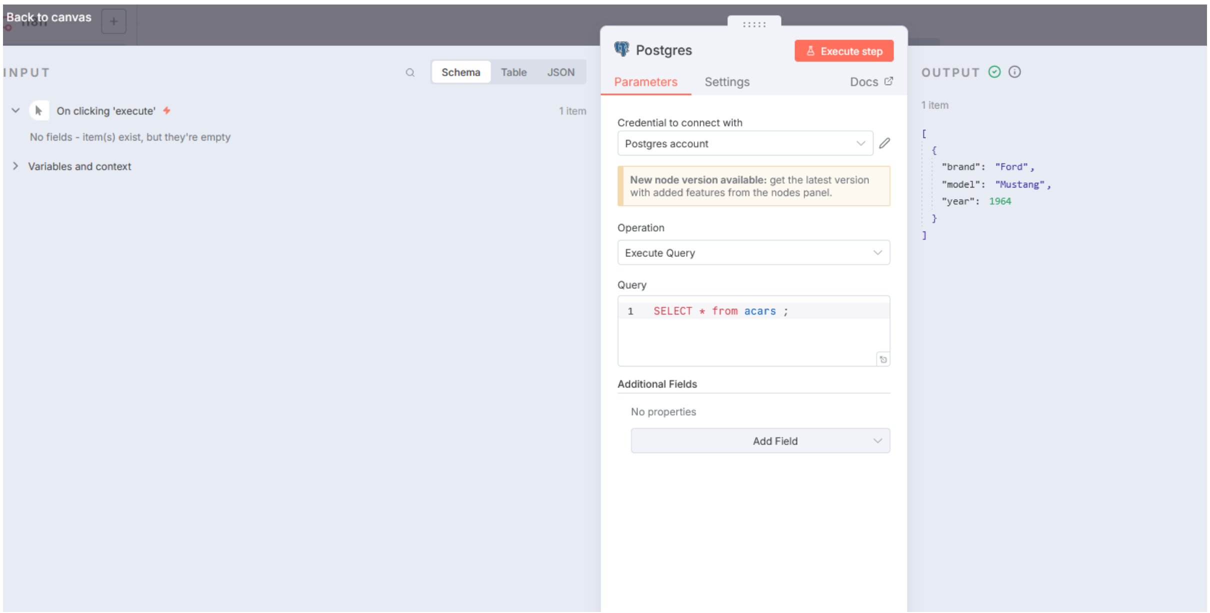
Database
kumar

User
kumar

Password
●●●

Maximum Number of Connections
100

Figure 25: User: kumar; password: kumar; database: kumar



No fields - item(s) exist, but they're empty

Credential to connect with
Postgres account

New node version available: get the latest version with added features from the nodes panel.

Operation
Execute Query

Query

```sql
SELECT * from acars ;
```

Additional Fields

No properties

```
[
  {
    "brand": "Ford",
    "model": "Mustang",
    "year": 1964
  }
]
```

*Figure 26: Query: select * from acars; The result is on the right.*

Extend the above workflow further, step-by-step:

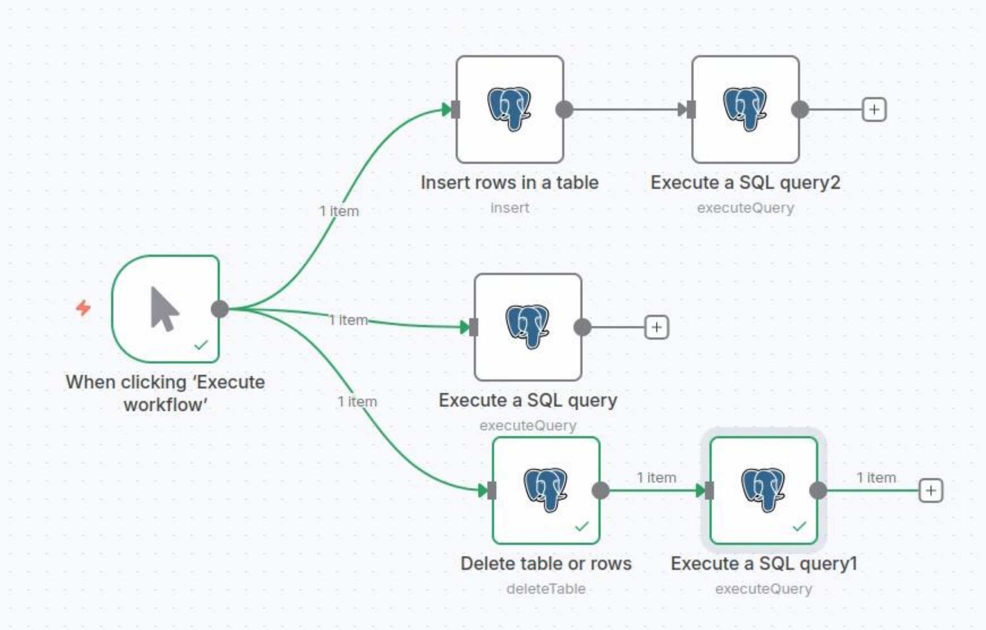
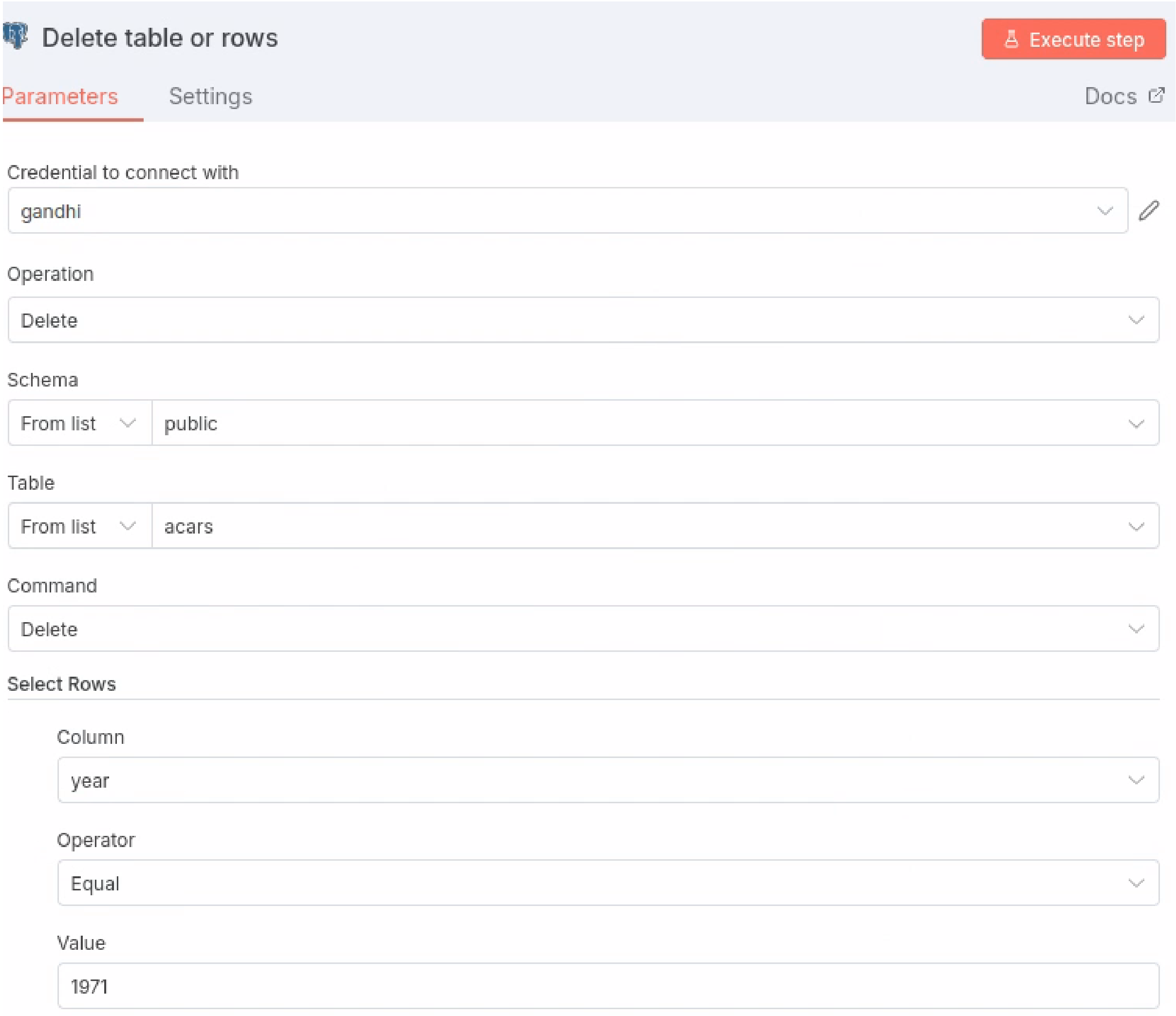


Figure 27; Workflow using different postgres nodes: Execute SQL Query, Insert rows, Delete table of rows



Delete table or rows

Credential to connect with: gandhi

Operation: Delete

Schema: From list — public

Table: From list — acars

Command: Delete

Select Rows

Column: year

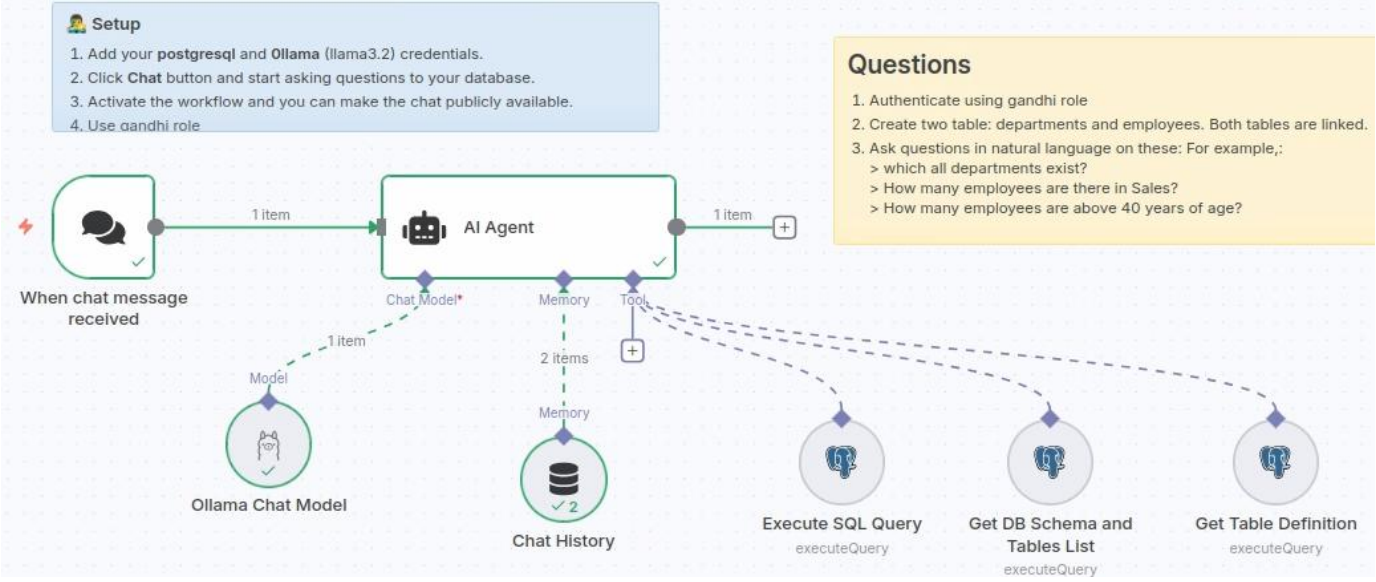
Operator: Equal

Value: 1971

Figure 28: Delete table rows settings

I. AI agent and postgres

Postgres with ai agent
https://n8n.io/workflows/1954-ai-agent-chat/



Setup

1. Add your **postgresql** and **Ollama** (llama3.2) credentials.
2. Click **Chat** button and start asking questions to your database.
3. Activate the workflow and you can make the chat publicly available.
4. Use gandhi role

Questions

1. Authenticate using gandhi role
2. Create two table: departments and employees. Both tables are linked.
3. Ask questions in natural language on these: For example,:
   > which all departments exist?
   > How many employees are there in Sales?
   > How many employees are above 40 years of age?

System prompt of AI agent:

> You are DB assistant. You need to run queries in DB aligned with user requests.
> Run custom SQL query to aggregate data and response to user. Make sure every table has schema prefix to it in sql query which you can get from `Get DB Schema and Tables List` tool.
> Fetch all data to analyse it for response if needed.

Tools

- Execute SQL query- Executes any sql query generated by AI
- Get DB Schema and Tables List - Lists all the tables in database with its schema name
- Get Table Definition - Gets the table definition from db using table name and schema name"

Create tables

(See this file (at line no 170-211)for all the quick code):

```
CREATE TABLE departments (
                           department_id int PRIMARY KEY,
                           department_name VARCHAR(100) NOT NULL
                           );

CREATE TABLE employees (
                    employee_id int PRIMARY KEY,
                    employee_name VARCHAR(100) NOT NULL,
                    age float,
                    departmentId INT REFERENCES departments (department_id)
                    );
```

INSERT Data:

```
INSERT INTO departments (department_id,department_name) values
(1, 'Human Resources'),
(10,'Finance'),
(20,'IT'),
(30, 'Operations') ;

INSERT INTO employees (employee_id,employee_name, age, departmentId) values
(1,'Alice', 30.4, 10),
(2,'Bob',50.8, 10),
(3,'sudha', 39.0, 20),
(4,'Charlie',34.0, 30);
```

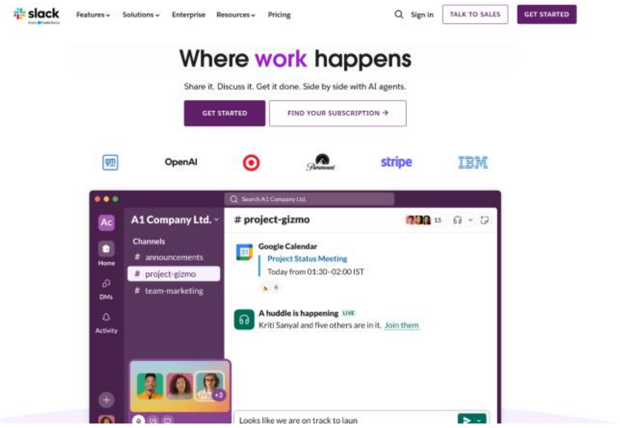
J. Data transformation

K. Sub-workflows in n8n

L. Using webhook in n8n

M. Slack

How to get slack api or token from slack. Here are the steps:



Where work happens

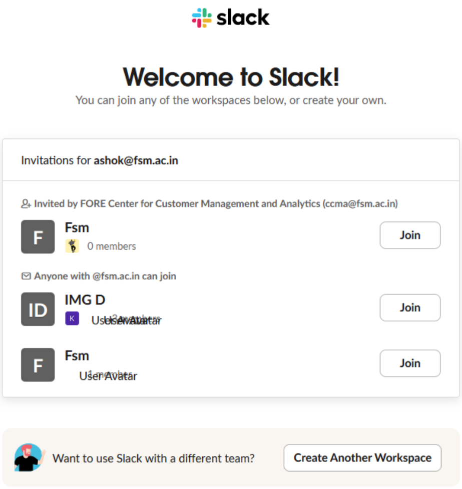
Share it. Discuss it. Get it done. Side by side with AI agents.

Google Calendar
Project Status Meeting
Today from 01:30–02:00 IST

A huddle is happening LIVE
Kriti Sanyal and five others are in it. Join them

Looks like we are on track to laun

Figure 29: Sign in using your email.



Welcome to Slack!

You can join any of the workspaces below, or create your own.

Invitations for **ashok@fsm.ac.in**

Invited by FORE Center for Customer Management and Analytics (ccma@fsm.ac.in)

Fsm
0 members
Join

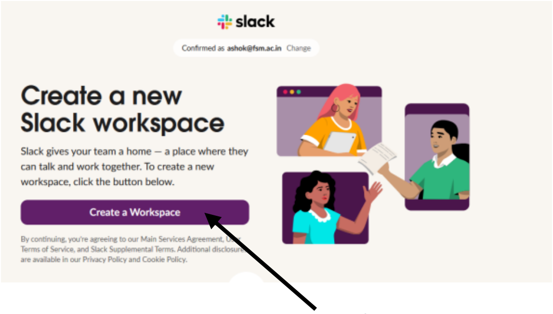
Anyone with @fsm.ac.in can join

IMG D
User Avatar 2 members
Join

Fsm
User Avatar 1 members
Join

Want to use Slack with a different team? Create Another Workspace

Figure 30: Create a new Workspace of your own where your team will work



Confirmed as **ashok@fsm.ac.in** Change

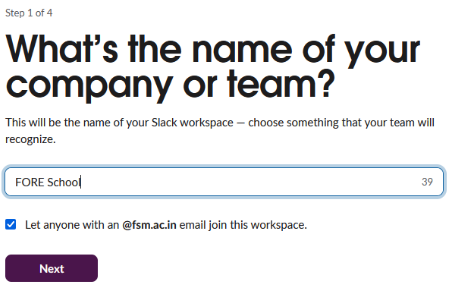
Create a new Slack workspace

Slack gives your team a home — a place where they can talk and work together. To create a new workspace, click the button below.

Create a Workspace

By continuing, you're agreeing to our Main Services Agreement, User Terms of Service, and Slack Supplemental Terms. Additional disclosures are available in our Privacy Policy and Cookie Policy.

Figure 31: Create a Workspace



Step 1 of 4

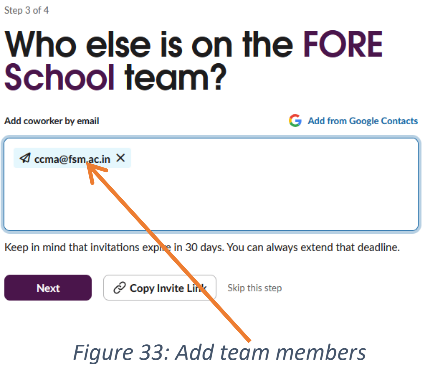
What's the name of your company or team?

This will be the name of your Slack workspace — choose something that your team will recognize.

FORE School 39

☑ Let anyone with an **@fsm.ac.in** email join this workspace.

Figure 32: Fill in some details about your workspace. Name your team and click Next



Step 3 of 4

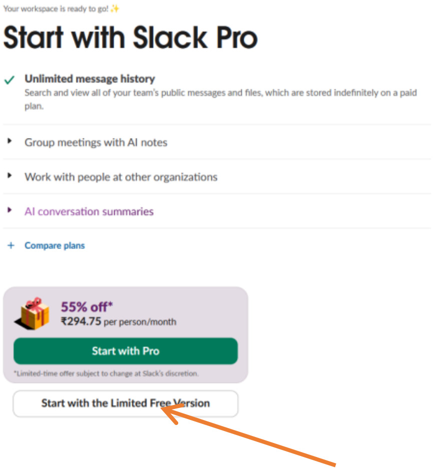
Who else is on the FORE School team?

Add coworker by email

ccma@fsm.ac.in

Keep in mind that invitations expire in 30 days. You can always extend that deadline.

Figure 33: Add team members



Your workspace is ready to go! ✨

Start with Slack Pro

✓ **Unlimited message history**
Search and view all of your team's public messages and files, which are stored indefinitely on a paid plan.

- Group meetings with AI notes
- Work with people at other organizations
- AI conversation summaries

+ Compare plans

55% off*
₹294.75 per person/month

*Limited-time offer subject to change at Slack's discretion.

Figure 34: No. Start with a limited free version

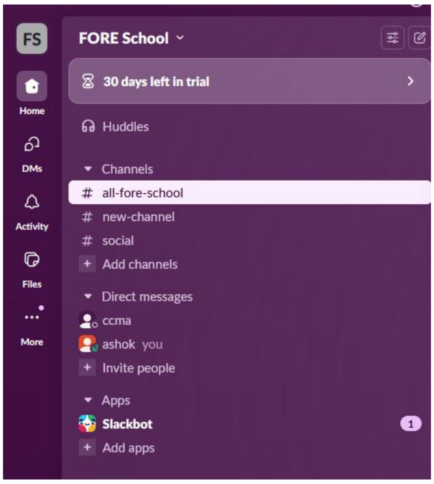


Figure 35: Three channels, one app

What are Slack channels:

A Slack channel is a dedicated space within a Slack workspace where teams can collaborate, communicate, and share information related to a specific topic, project, or team. Channels can be public, allowing anyone in the workspace to join, or private, requiring explicit invitation. Key features of channels are:

Collaboration: Channels facilitate communication, file sharing, and even video/audio calls.

Searchability: Messages and files within a channel are searchable, making it easy to find past conversations and information.

Customization: Channels can be created for various purposes, such as project updates, team discussions, or specific topics.

A company might have a public channel for general announcements (#general), a private channel for sensitive HR matters (#hr-private), and a project-specific channel for a new product launch (#product-launch).

What is an app

Apps connect other software that you use (such as Google Calendar, OneDrive or one of your company's internal tools) to Slack. With all your tools in one place, you can streamline work and help people in your workspace collaborate more effectively.

What you need to know

- There are a few different types of apps that you may see in Slack – built by Slack, third parties or your own team. How an app was built determines how it can be installed and managed in a workspace, as well as where and how you'll be able to interact with it.
- By default, any workspace member can install apps, but owners and admins can choose to restrict this permission. Once an app is installed to a workspace, any member can connect their account to use it.
- Before installing an app from the Slack Marketplace, you can review its privacy policy and security and compliance information (if submitted by the app's developer) from the app page. We recommend only choosing services that you trust when installing apps to Slack.

N. Pinecone vector store:

1. Create a free account (say, using google)
2. Create an API key
3. Create a (vector) index

Understanding Pinecone indexes:

In Pinecone, an index is the primary organizational unit for storing and querying vector data. Think of it as a table in a database, but specifically designed for efficient similarity searches on vectors. Indexes can accept, store, and serve queries on vectors, as well as perform other vector operations. Here's a more detailed breakdown:

Storage and Organization:
Indexes hold the vector embeddings of your data, allowing you to store and manage them in a structured way.

Key Parameters dimension etc:
When creating an index, you'll need to define its name, the dimensionality of the vectors it will store, and the similarity metric (e.g., cosine, Euclidean).

Types of Indexes for scaling out:
Pinecone offers serverless and pod-based indexes, with different options for scaling and performance.

Namespaces:
Within an index, you can further organize data using namespaces, allowing you to isolate queries to specific subsets of your data.

Similarity Search:
Pinecone indexes are built for efficient similarity searches, meaning you can quickly find vectors that are similar to a given query vector.

Highest Level:
It's the top-level container for your vector data within Pinecone, similar to a table in a relational database.

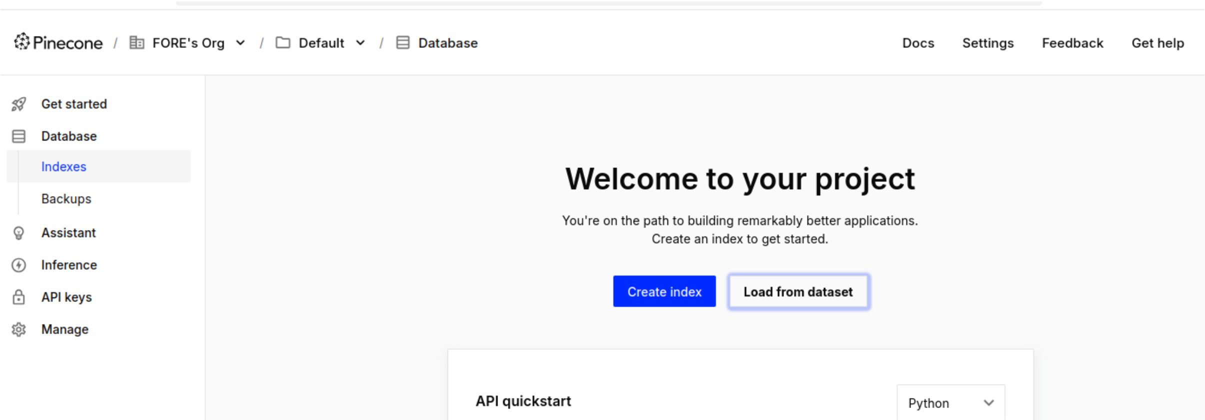
Creation and Management:
Indexes can be created via the Pinecone UI or programmatically using their API.

Metadata:
Pinecone indexes can store associated metadata with each vector, enabling filtering and more complex search conditions.

Metadata

Every record in an index must contain an ID and a vector. In addition, you can include metadata key-value pairs to store additional information or context. When you query the index, you can then include a metadata filter to limit the search to records matching a filter expression. Searches without metadata filters do not consider metadata and search the entire namespace.

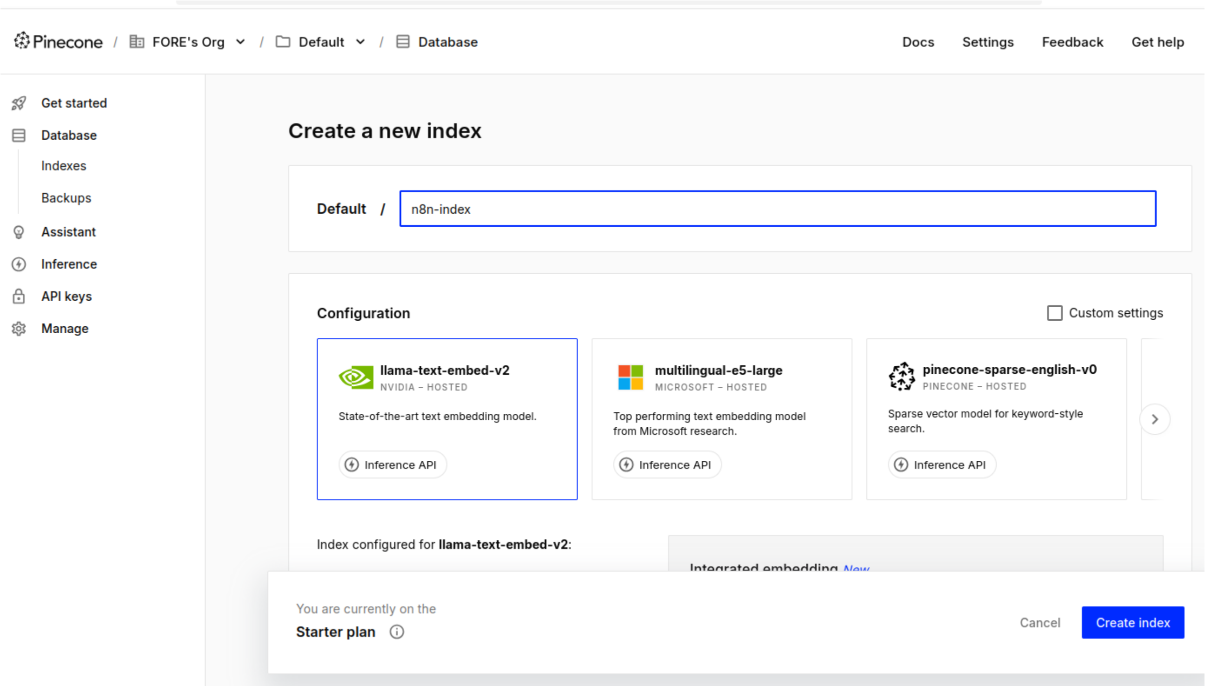
See LlamaIndex example for Chromadb as to how metadata filter works.



Welcome to your project

You're on the path to building remarkably better applications.
Create an index to get started.

Figure 36: Click Create Index to begin creating an index



Create a new index

Default / n8n-index

Configuration

□ Custom settings

llama-text-embed-v2
NVIDIA – HOSTED
State-of-the-art text embedding model.

multilingual-e5-large
MICROSOFT – HOSTED
Top performing text embedding model from Microsoft research.

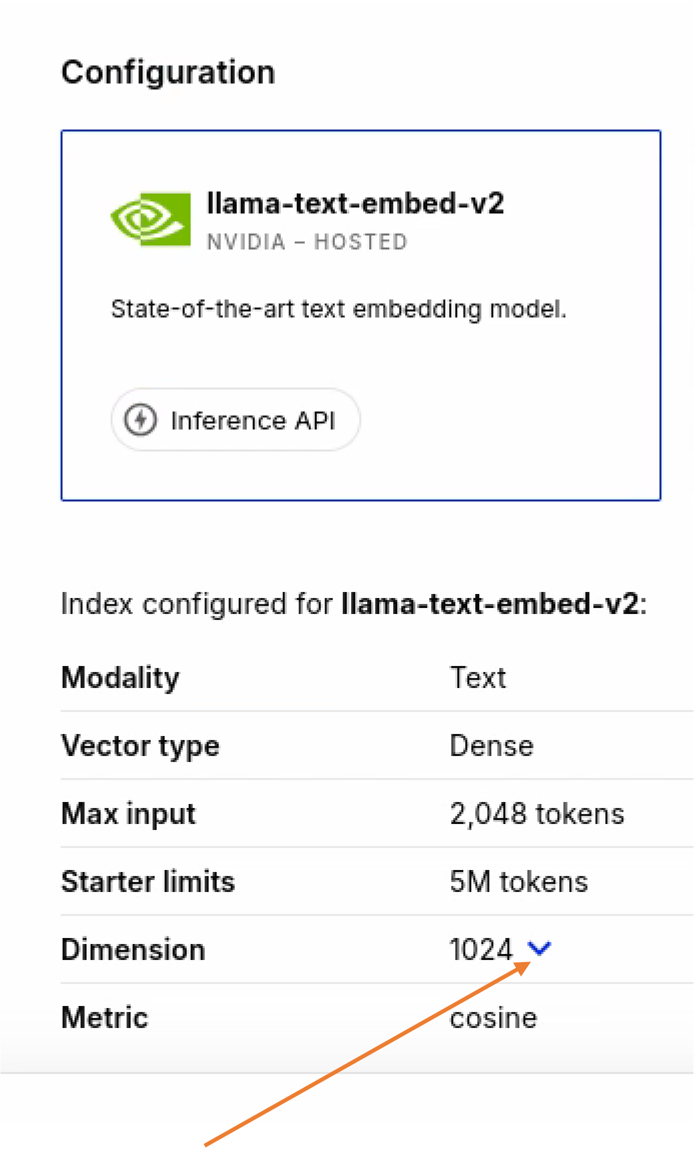
pinecone-sparse-english-v0
PINECONE – HOSTED
Sparse vector model for keyword-style search.

Index configured for **llama-text-embed-v2**:

Integrated embedding *New*

You are currently on the
Starter plan

Figure 37: Select an index and select a Configuration for index (such as Vector Dimension: 768, 1024 etc). See figure below



Configuration

llama-text-embed-v2

NVIDIA – HOSTED

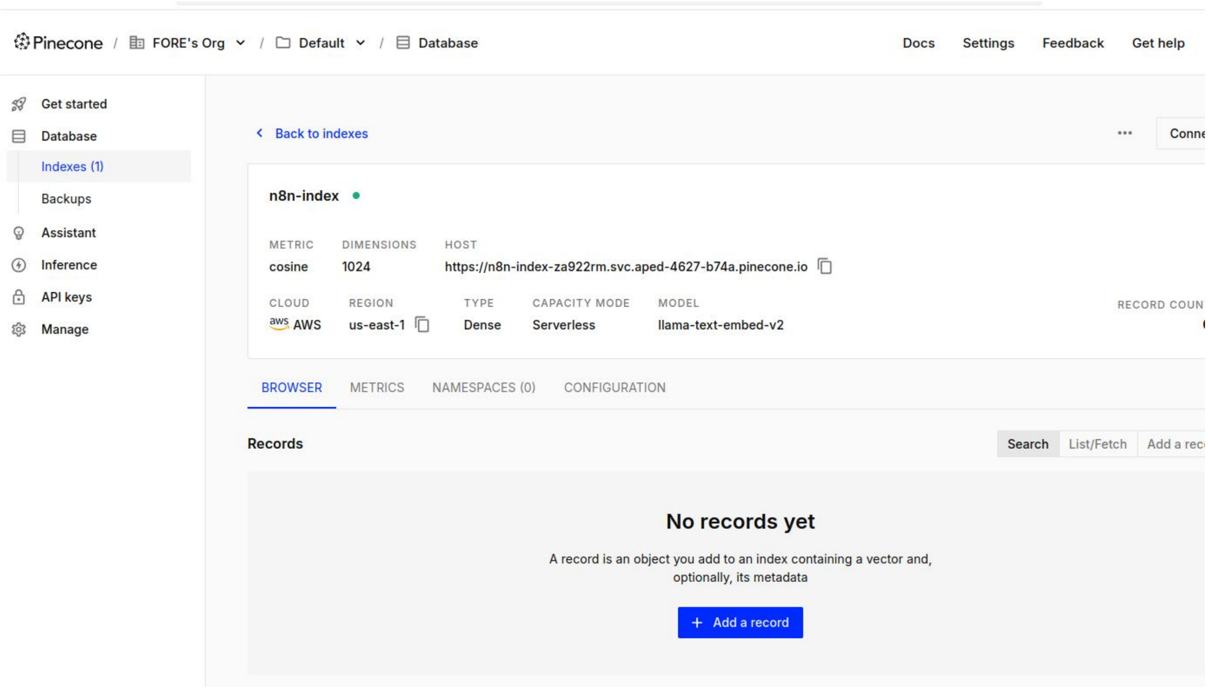
State-of-the-art text embedding model.

Inference API

Index configured for **llama-text-embed-v2**:

Modality	Text
Vector type	Dense
Max input	2,048 tokens
Starter limits	5M tokens
Dimension	1024
Metric	cosine

Figure 38: Set vector Dimension as per your embedder (click Down-arrow). For example, nomic-embed-text has a vector dimension of 768 AND NOT of 1024. We have used 768



n8n-index

METRIC	DIMENSIONS	HOST
cosine	1024	https://n8n-index-za922rm.svc.aped-4627-b74a.pinecone.io

CLOUD	REGION	TYPE	CAPACITY MODE	MODEL	RECORD COUN
AWS	us-east-1	Dense	Serverless	llama-text-embed-v2	

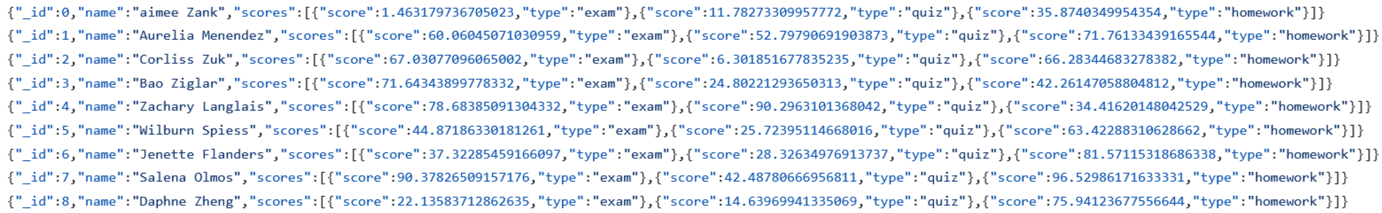
No records yet

A record is an object you add to an index containing a vector and, optionally, its metadata

Figure 39: Create index. Records will come from n8n workflow

Note that selected embedder will also decide max input tokens. The character splitter chunk size will affect the amount of **input tokens** you're trying to get. For the embedding model of. *mxbai-embed-large,* max input token limit is 512.

Our dataset is *students.json* on GitHub, at site: LLMs/install_ai_tools/mongodb//datasets/



```
{"_id":0,"name":"aimee Zank","scores":[{"score":1.463179736705023,"type":"exam"},{"score":11.78273309957772,"type":"quiz"},{"score":35.8740349954354,"type":"homework"}]}
{"_id":1,"name":"Aurelia Menendez","scores":[{"score":60.06045071030959,"type":"exam"},{"score":52.79790691903873,"type":"quiz"},{"score":71.76133439165544,"type":"homework"}]}
{"_id":2,"name":"Corliss Zuk","scores":[{"score":67.03077096065002,"type":"exam"},{"score":6.301851677835235,"type":"quiz"},{"score":66.28344683278382,"type":"homework"}]}
{"_id":3,"name":"Bao Ziglar","scores":[{"score":71.64343899778332,"type":"exam"},{"score":24.80221293650313,"type":"quiz"},{"score":42.26147058804812,"type":"homework"}]}
{"_id":4,"name":"Zachary Langlais","scores":[{"score":78.68385091304332,"type":"exam"},{"score":90.2963101368042,"type":"quiz"},{"score":34.41620148042529,"type":"homework"}]}
{"_id":5,"name":"Wilburn Spiess","scores":[{"score":44.87186330181261,"type":"exam"},{"score":25.72395114668016,"type":"quiz"},{"score":63.42288310628662,"type":"homework"}]}
{"_id":6,"name":"Jenette Flanders","scores":[{"score":37.32285459166097,"type":"exam"},{"score":28.32634976913737,"type":"quiz"},{"score":81.57115318686338,"type":"homework"}]}
{"_id":7,"name":"Salena Olmos","scores":[{"score":90.37826509157176,"type":"exam"},{"score":42.48780666956811,"type":"quiz"},{"score":96.52986171633331,"type":"homework"}]}
{"_id":8,"name":"Daphne Zheng","scores":[{"score":22.13583712862635,"type":"exam"},{"score":14.63969941335069,"type":"quiz"},{"score":75.94123677556644,"type":"homework"}]}
```

Figure 40: Extract from file students.json

Here are two rows from the data:

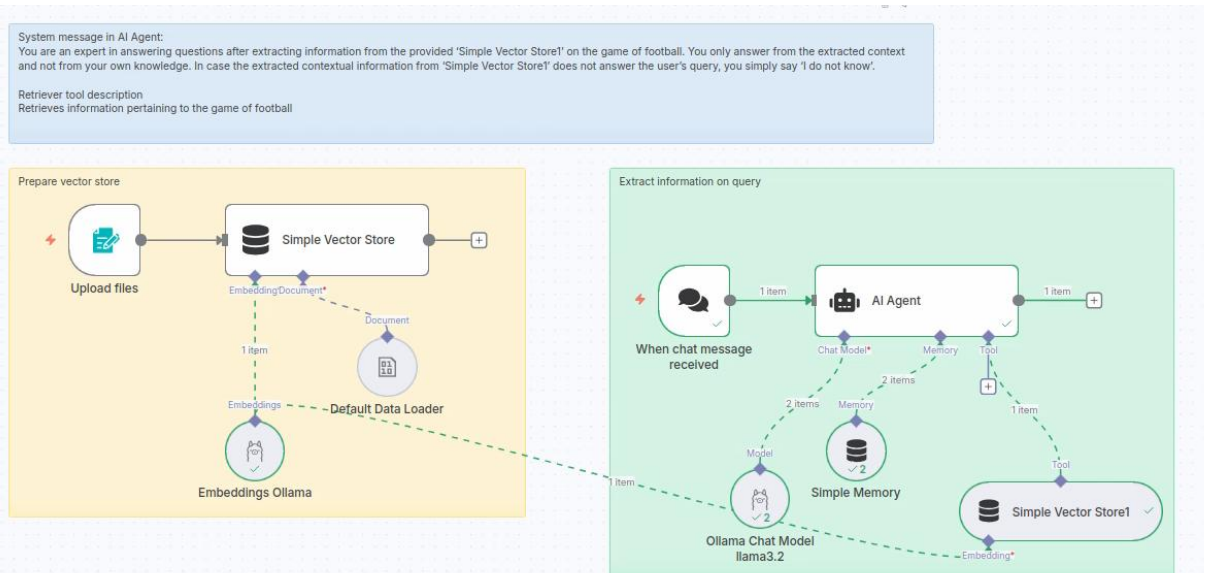
```
{"_id":0,"name":"aimee
Zank","scores":[{"score":1.463179736705023,"type":"exam"},{"score":11.78273309957772,"type":"q
uiz"},{"score":35.8740349954354,"type":"homework"}]}
```

```
{"_id":1,"name":"Aurelia
Menendez","scores":[{"score":60.06045071030959,"type":"exam"},{"score":52.79790691903873,"type
":"quiz"},{"score":71.76133439165544,"type":"homework"}]}
```

O. Simple RAG with n8n

File: 'Simple RAG flow.json'

We use '*n8n Form trigger*' node as file uploader. The vector store is in-memory vector store: Simple Vector Store.



System message in AI Agent:
You are an expert in answering questions after extracting information from the provided 'Simple Vector Store1' on the game of football. You only answer from the extracted context and not from your own knowledge. In case the extracted contextual information from 'Simple Vector Store1' does not answer the user's query, you simply say 'I do not know'.

Retriever tool description
Retrieves information pertaining to the game of football

Figure 41: Full workflow

Its two sub-workflows are as follows:

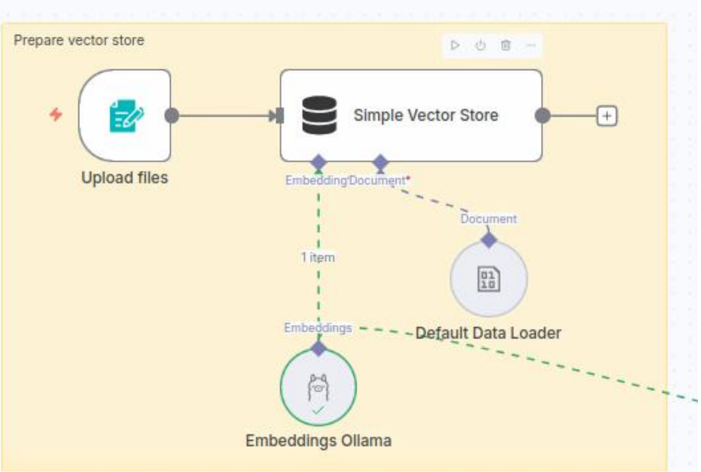
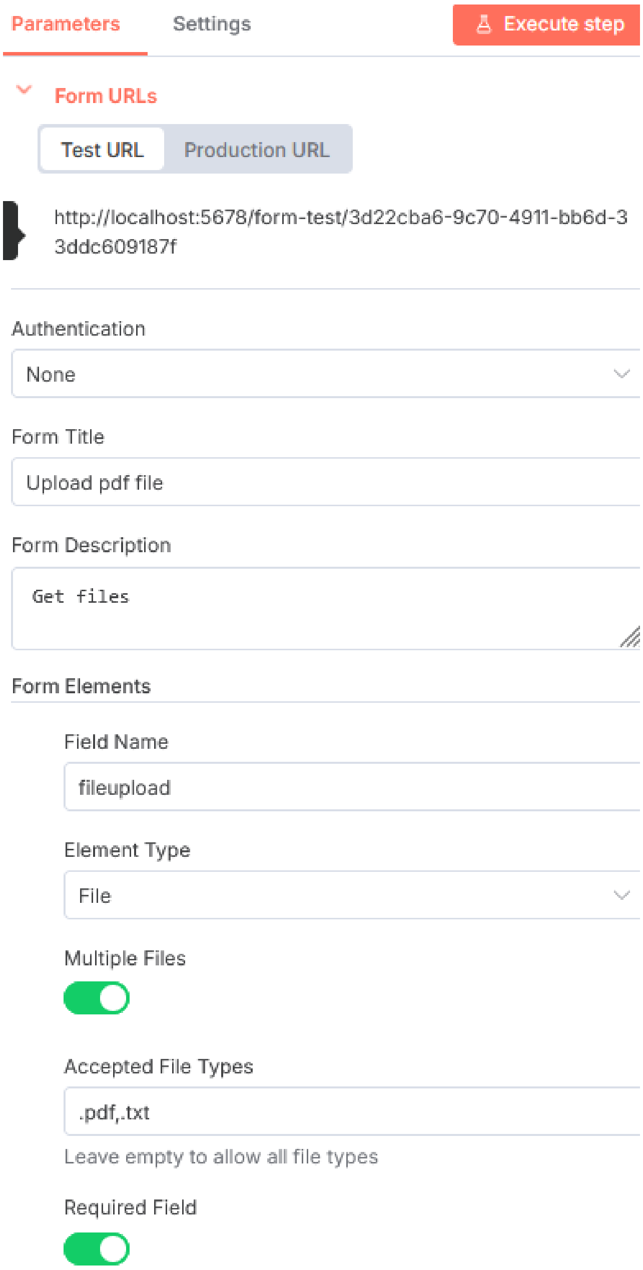


Figure 42: Creating a vector store

Upload files node (n8n form):



http://localhost:5678/form-test/3d22cba6-9c70-4911-bb6d-33ddc609187f

Authentication: None

Form Title: Upload pdf file

Form Description: Get files

Form Elements

Field Name: fileupload

Element Type: File

Multiple Files: ●

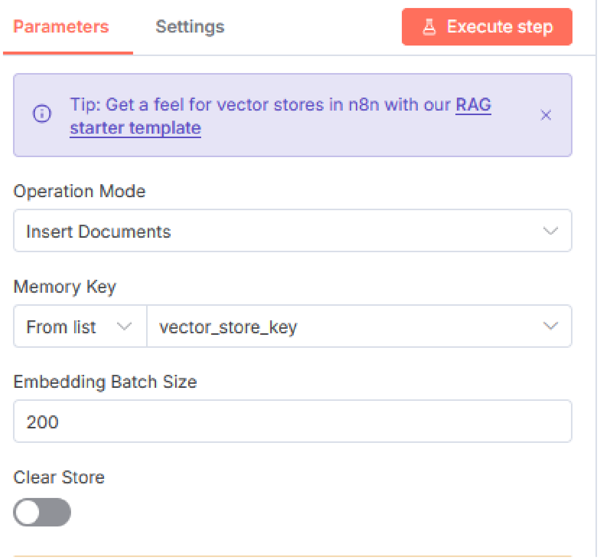
Accepted File Types: .pdf,.txt

Leave empty to allow all file types

Required Field: ●

Figure 43: File upload with n8n form. Allow both pdf and txt files upload. Easy to upload Paul Graham essay on Good Wrining.

Simple vector store



Tip: Get a feel for vector stores in n8n with our RAG starter template

Operation Mode: Insert Documents

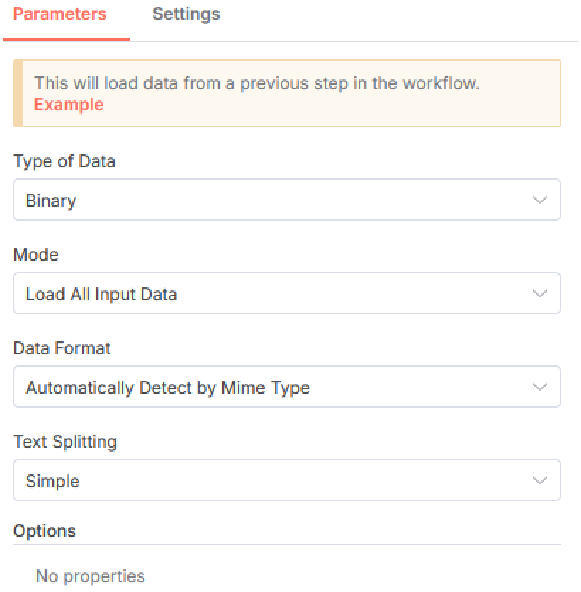
Memory Key: From list — vector_store_key

Embedding Batch Size: 200

Clear Store: off

Figure 44: Simple Vector store configuration

Default Data loader



This will load data from a previous step in the workflow. Example

Type of Data: Binary

Mode: Load All Input Data

Data Format: Automatically Detect by Mime Type

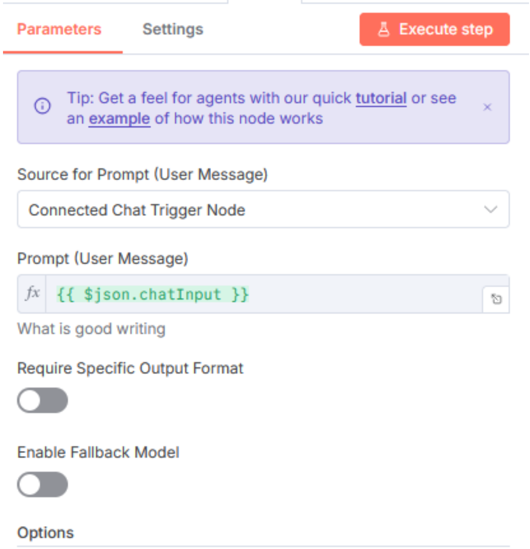
Text Splitting: Simple

Options

No properties

Figure 45: Default data loader. Type of data is Binary. Text splitting is Simple

AI Agent has no special system prompt. Default is OK. But you should change. See below the suggested system message.



Tip: Get a feel for agents with our quick tutorial or see an example of how this node works

Source for Prompt (User Message)
Connected Chat Trigger Node

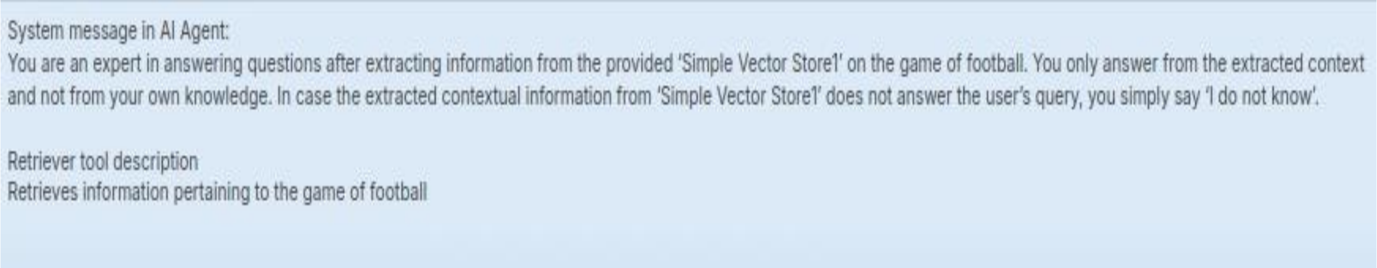
Prompt (User Message)
`{{ $json.chatInput }}`
What is good writing

Require Specific Output Format
○

Enable Fallback Model
○

Options

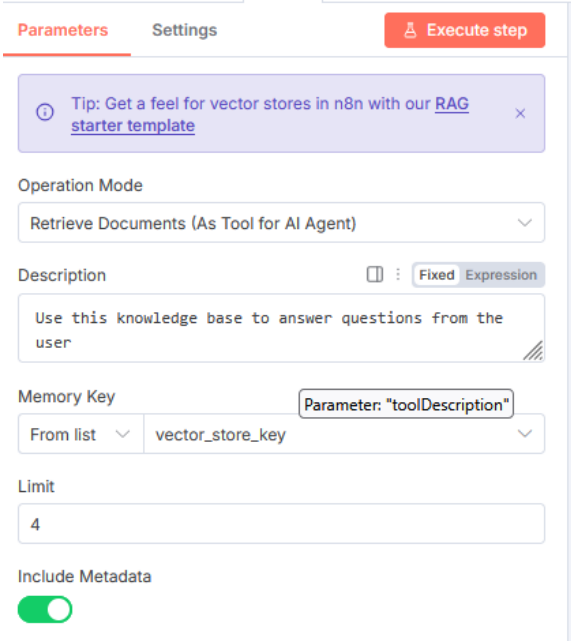
Figure 46: No special System prompt in AI Agent



System message in AI Agent:
You are an expert in answering questions after extracting information from the provided 'Simple Vector Store1' on the game of football. You only answer from the extracted context and not from your own knowledge. In case the extracted contextual information from 'Simple Vector Store1' does not answer the user's query, you simply say 'I do not know'.

Retriever tool description
Retrieves information pertaining to the game of football

Simple vector store below AI Agent



Tip: Get a feel for vector stores in n8n with our RAG starter template

Operation Mode
Retrieve Documents (As Tool for AI Agent)

Description
```
Use this knowledge base to answer questions from the
user
```

Parameter: "toolDescription"

Memory Key
From list | vector_store_key

Limit
4

Include Metadata
●

Figure 47: Simple vector store on AI Agent side

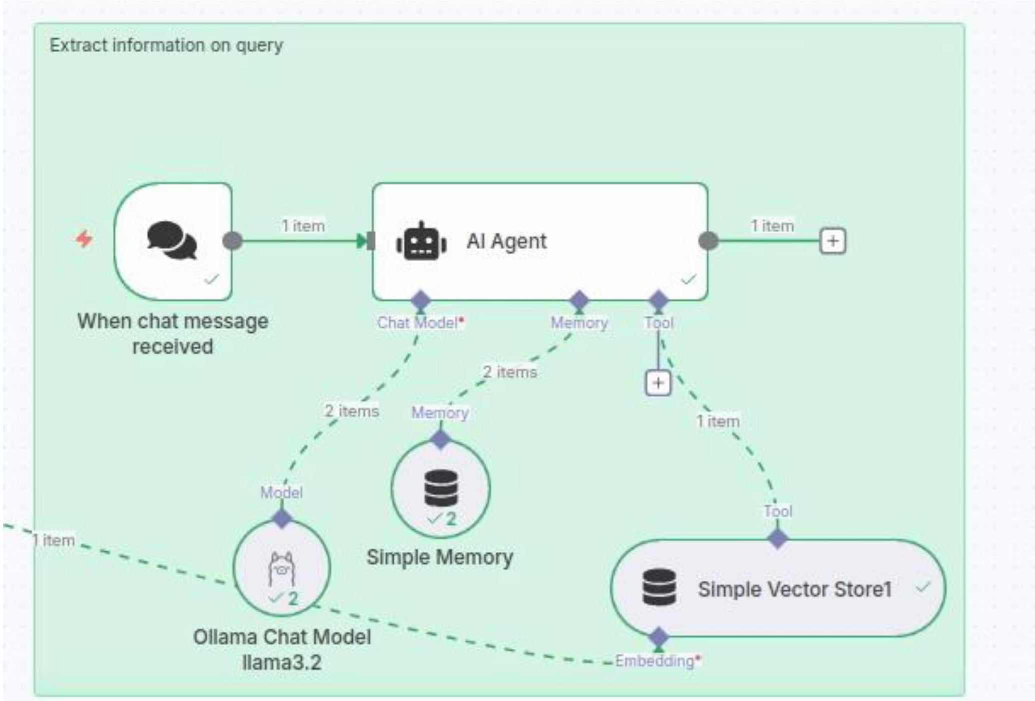
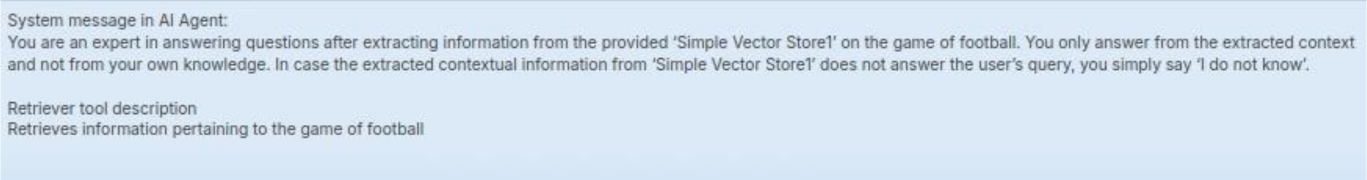


Figure 48: Querying a vector store

System message of AI Agent and vector tool description are as follows:



System message in AI Agent:
You are an expert in answering questions after extracting information from the provided 'Simple Vector Store1' on the game of football. You only answer from the extracted context and not from your own knowledge. In case the extracted contextual information from 'Simple Vector Store1' does not answer the user's query, you simply say 'I do not know'.

Retriever tool description
Retrieves information pertaining to the game of football

Figure 49: System message for AI Agent

P. RAG with Pinecone

N8n model files: n8n/2025/Rag Flow-I.json and Rag Flow-II.json
Dataset files: Try this

See this link for the detailed blog. Vectorization may take a very long time depending upon the input size. As vectorization of files may take a long time, a smaller json file is on GitHub at this link. This file has 35 json records.

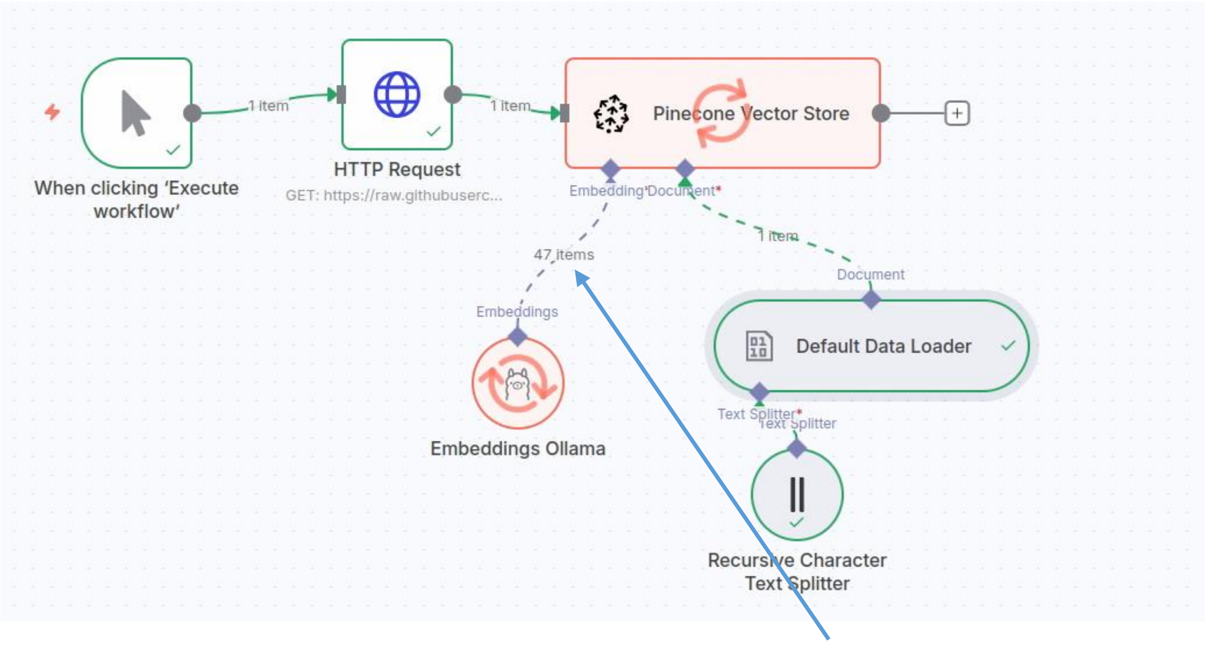
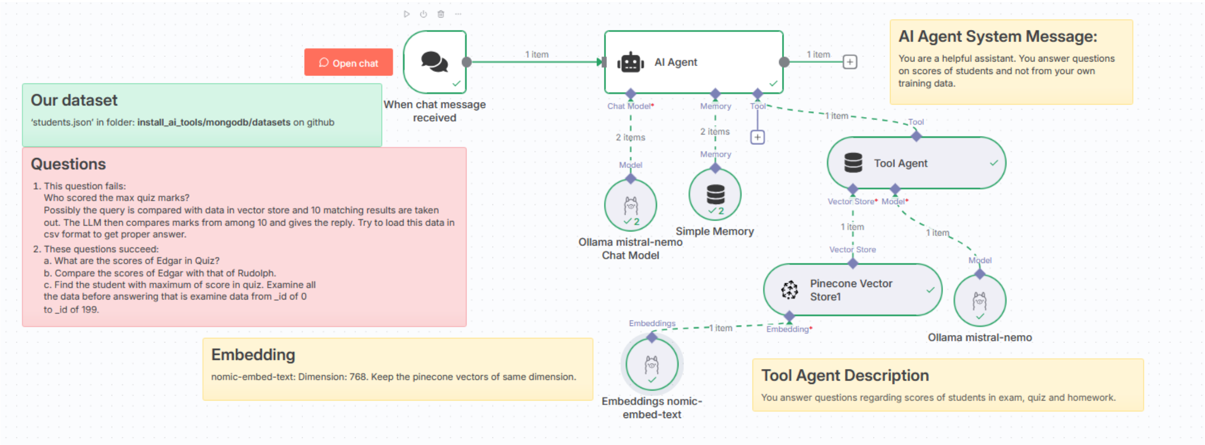


Figure 50: Our workflow to save data to vector store. 47 items possibly means that 47 chunks were processed till now. Chunk size for Recursive text splitter is 512 as selected embedder is:



Our dataset

'students.json' in folder: **install_ai_tools/mongodb/datasets** on github

Questions

1. This question fails:
   Who scored the max quiz marks?
   Possibly the query is compared with data in vector store and 10 matching results are taken out. The LLM then compares marks from among 10 and gives the reply. Try to load this data in csv format to get proper answer.
2. These questions succeed:
   a. What are the scores of Edgar in Quiz?
   b. Compare the scores of Edgar with that of Rudolph.
   c. Find the student with maximum of score in quiz. Examine all the data before answering that is examine data from _id of 0 to _id of 199.

Embedding

nomic-embed-text: Dimension: 768. Keep the pinecone vectors of same dimension.

AI Agent System Message:

You are a helpful assistant. You answer questions on scores of students and not from your own training data.

Tool Agent Description

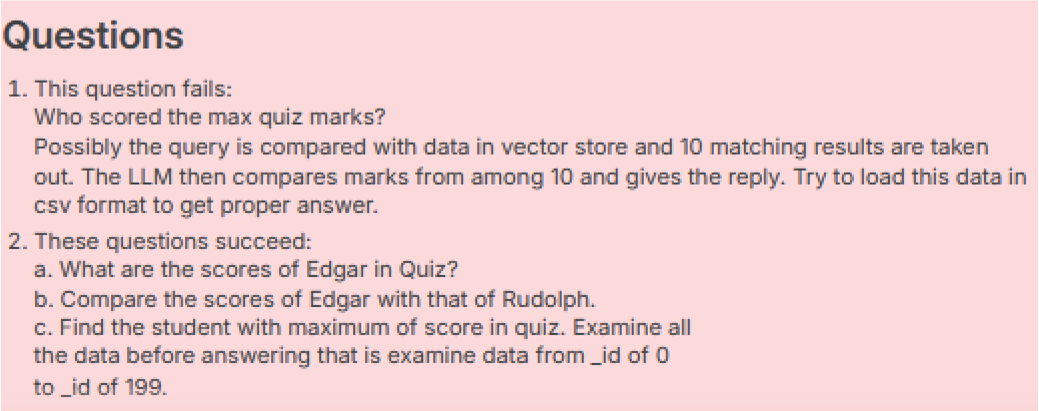
You answer questions regarding scores of students in exam, quiz and homework.

Figure 51: Reading vector data from Pinecone vector store

a. Here are the models used:

Embedding: nomic-embed-text (ollama)
Chat ollama: mistral-nemo (ollama)

b. Questions asked:



Questions

1. This question fails:
   Who scored the max quiz marks?
   Possibly the query is compared with data in vector store and 10 matching results are taken out. The LLM then compares marks from among 10 and gives the reply. Try to load this data in csv format to get proper answer.
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   b. Compare the scores of Edgar with that of Rudolph.
   c. Find the student with maximum of score in quiz. Examine all the data before answering that is examine data from _id of 0 to _id of 199.

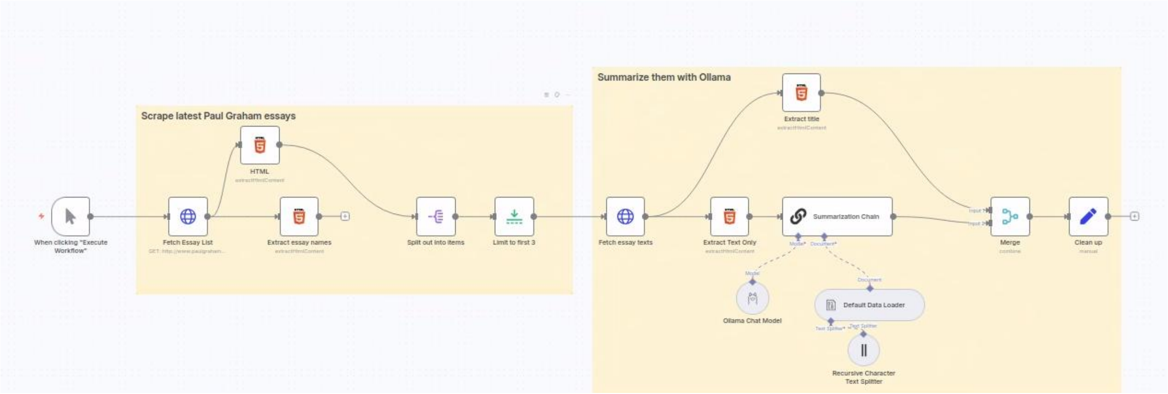
c. AI Agent System message:

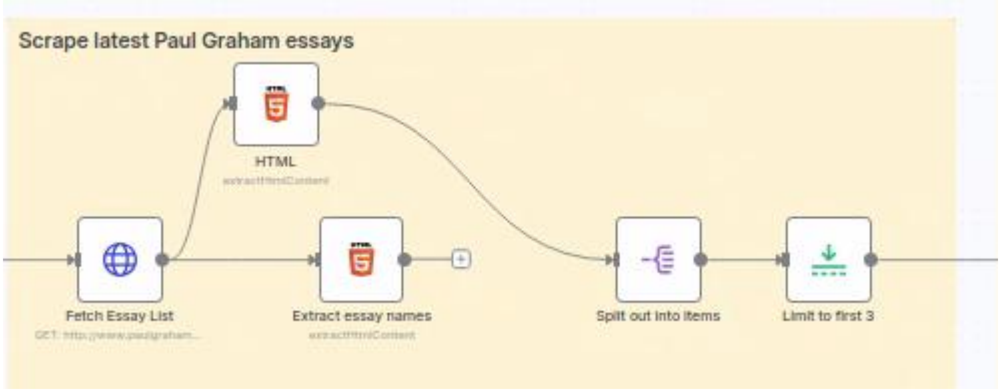
You are a helpful assistant. You answer questions on scores of students and not from your own training data.

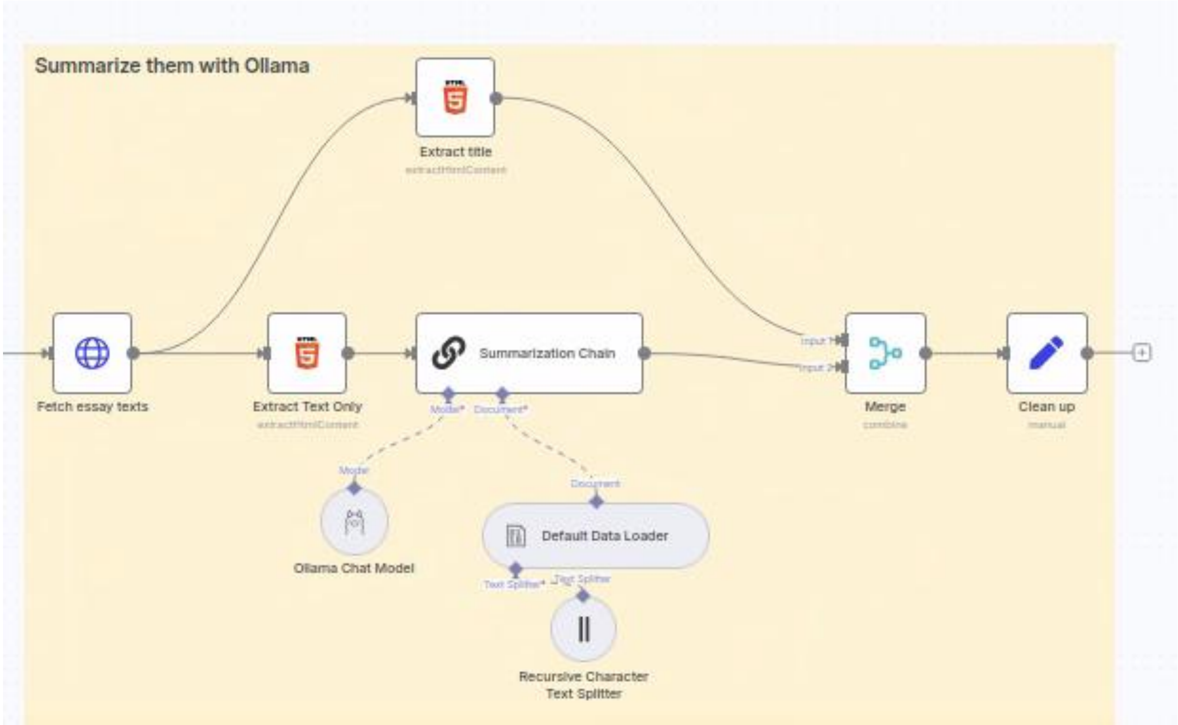
d. Tool Agent Description

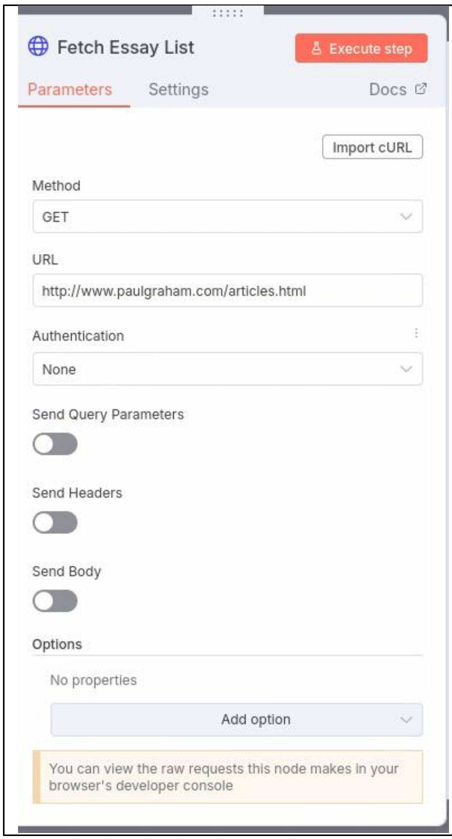
You answer questions regarding scores of students in exam, quiz and homework.

Scrapping web-pages and summarization









Fetch Essay List

Method
GET

URL
http://www.paulgraham.com/articles.html

Authentication
None

Send Query Parameters
○

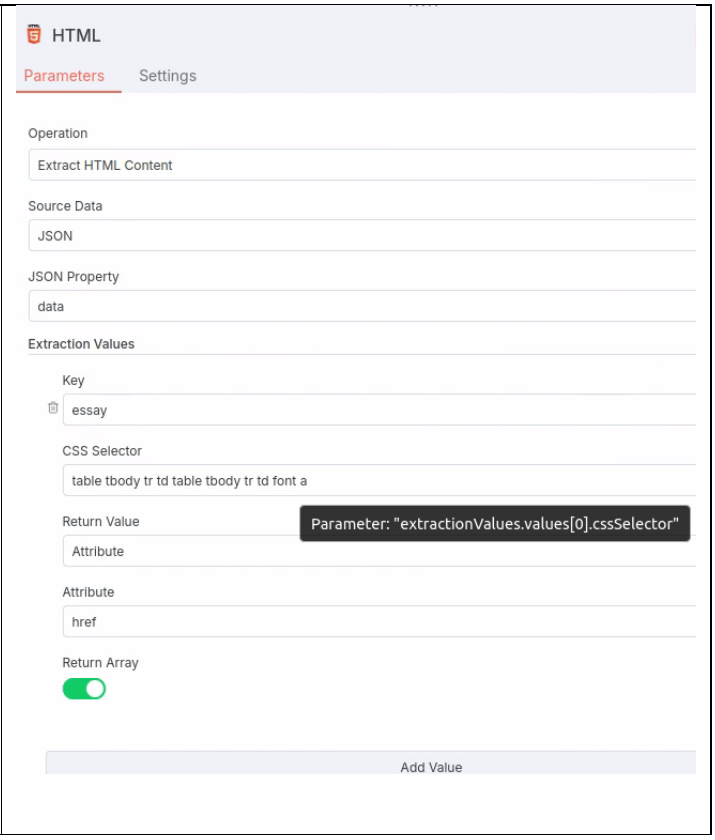
Send Headers
○

Send Body
○

Options

No properties

You can view the raw requests this node makes in your browser's developer console



HTML

Operation
Extract HTML Content

Source Data
JSON

JSON Property
data

Extraction Values

Key
essay

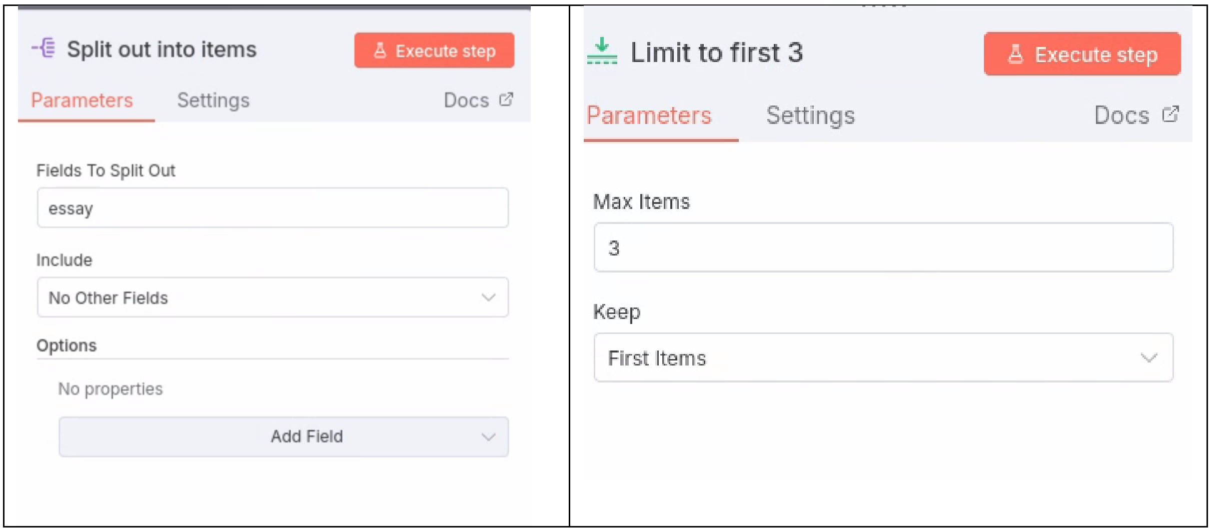
CSS Selector
table tbody tr td table tbody tr td font a

Parameter: "extractionValues.values[0].cssSelector"

Return Value
Attribute

Attribute
href

Return Array
●



Split out into items

Fields To Split Out: essay

Include: No Other Fields

Options

No properties

Limit to first 3

Max Items: 3

Keep: First Items

n8n how to decide css selector in html node
Thinking
Kicking off 7 searches
Looking at 105 sites
Putting it all together
Deciding on the correct CSS selector in n8n's HTML node (formerly HTML Extract node) is crucial for accurately extracting the data you need from a web page. Here's a breakdown of how to approach this, including recommended practices and tools:
1. Using Browser Developer Tools (Inspect Element)
The easiest and most common way to identify the correct CSS selector is by using your web browser's developer tools.

- **Navigate to the web page:** Open the web page containing the data you want to scrape in your browser.
- **Inspect the element:** Right-click on the specific element (text, image, link, etc.) you want to extract and select "Inspect" or "Inspect Element". This will open the browser's developer tools and highlight the element's HTML code.
- **Copy the CSS Selector/Path:** In the developer tools (usually under the "Elements" tab), right-click on the highlighted HTML element and choose "Copy" > "Selector". This will copy the CSS selector to your clipboard

Using the CSS selector in the n8n HTML node

- **Add an HTML node to your workflow:** According to n8n Docs and, the node is called "HTML" (it replaced the older "HTML Extract" node).
- **Set Source Data:** Choose "JSON" if the HTML content is in the JSON output of a previous node (like an HTTP Request node), or "Binary" if the HTML is in a binary file.
- **Specify JSON Property (if applicable):** Enter the name of the JSON property containing the HTML.
- **Add Extraction Value:** Click "Add Value" to define what you want to extract.
- **Key:** Enter a name for the extracted value (e.g., "title", "price").
- **CSS Selector:** Paste the CSS selector you identified in the previous steps.

- **Return Value:** Choose the type of data to return: "Attribute" (e.g., "href" for links), "HTML", "Text", or "Value" (for input elements).
- **Return Array (if applicable):** If you expect multiple elements to match the selector, enable "Return Array" to get an array of values.

Example:
If you want to extract the text "Medium" from a `<span>` element within a table, the copied CSS selector might look like:

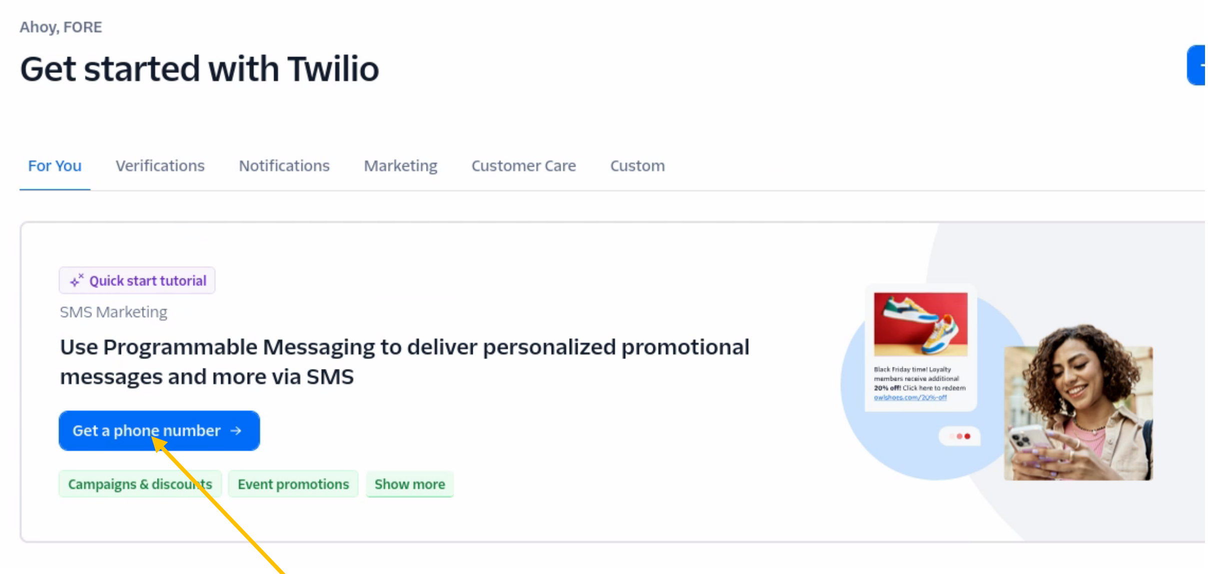
```
body > table:nth-child(2) > tbody:nth-child(1) > tr:nth-child(1) > td:nth-child(2) > span:nth-child(1)
```

Understanding CSS Selector Syntax:
Familiarize yourself with basic CSS selector syntax (e.g., `.` for classes, `#` for IDs, `>` for direct children, `nth-child()` for selecting elements based on their position) to create or modify selectors manually if needed.

Q. Send SMS using Twilio

1. Open Twilio home page:
2. Click on 'Start for free' button at the top-right
3. At the bottom of this page, click on Sign up with Google
4. After signing in, you have to enter your mobile number so as to verify the destination SMS address. Click the button *Send code via SMS*
5. You will receive a verification code on your mobile by SMS. Enter the code and click Verify button.
6. You will get a recovery code. Copy and Save it somewhere (maybe your email): XYTMNTY5PGJLS7FA52S5MY3YHP
7. Click *Continue* button
8. Fill up some survey information.
   Which channel are you interested in? ==> **Select SMS**
9. You are taken to following screen. This screen has two parts: Top and Bottom.

In the top part, you are invited to get a free telephone number from where you will get an SMS. Note down this number.



Ahoy, FORE

Get started with Twilio

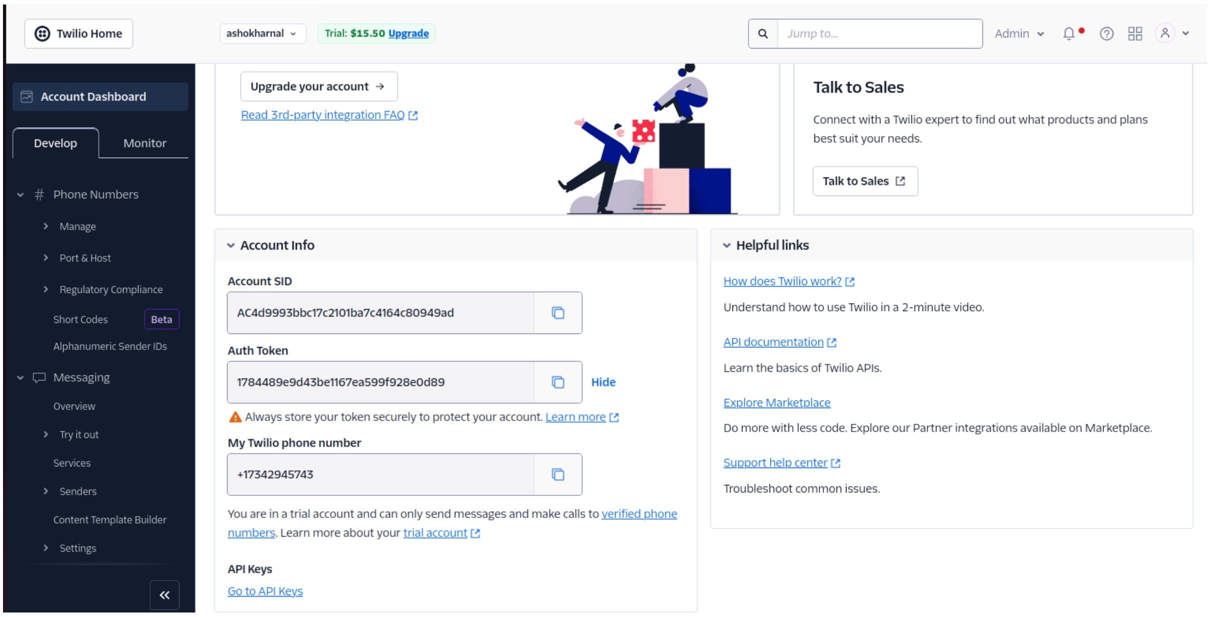
SMS Marketing

Use Programmable Messaging to deliver personalized promotional messages and more via SMS

Get a phone number →
Campaigns & discounts
Event promotions
Show more
Black Friday time! Loyalty members receive additional 20% off! Click here to redeem owlshoes.com/20%-off

Figure 52: Click the button 'Get Phone Number'

In the bottom part of the page, you get *Account information* and *Auth token*. Save this information also.



Talk to Sales

Connect with a Twilio expert to find out what products and plans best suit your needs.

Account Info

Account SID: AC4d9993bbc17c2101ba7c4164c80949ad

Auth Token: 1784489e9d43be1167ea599f928e0d89

⚠ Always store your token securely to protect your account. Learn more

My Twilio phone number: +17342945743

You are in a trial account and can only send messages and make calls to verified phone numbers. Learn more about your trial account

API Keys

Go to API Keys

Helpful links

How does Twilio work?

Understand how to use Twilio in a 2-minute video.

API documentation

Learn the basics of Twilio APIs.

Explore Marketplace

Do more with less code. Explore our Partner integrations available on Marketplace.

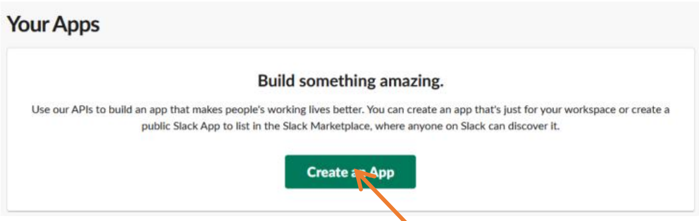
Support help center

Troubleshoot common issues.

Figure 53: Copy each and every information from this page into your email

R. Slack API

To work with Slack API, click on this link or in Google, search for Slack API. Click here OR here.

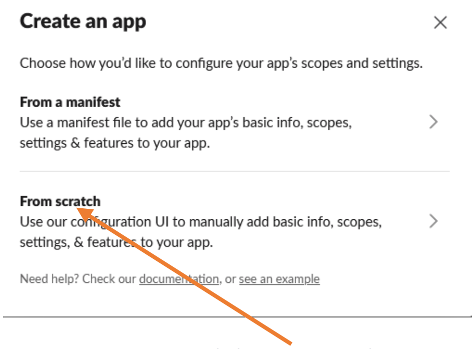


Your Apps

Build something amazing.

Use our APIs to build an app that makes people's working lives better. You can create an app that's just for your workspace or create a public Slack App to list in the Slack Marketplace, where anyone on Slack can discover it.

Figure 54: Click on Create an App



Create an app

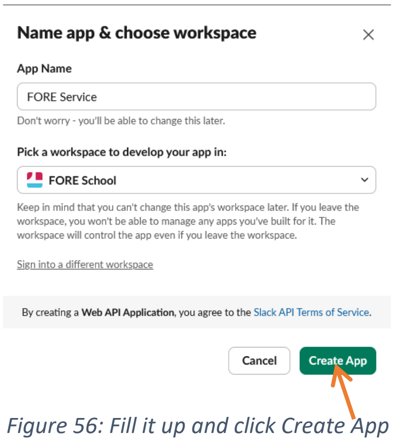
Choose how you'd like to configure your app's scopes and settings.

From a manifest
Use a manifest file to add your app's basic info, scopes, settings & features to your app.

From scratch
Use our configuration UI to manually add basic info, scopes, settings, & features to your app.

Need help? Check our documentation, or see an example

Figure 55: Click From Scratch



Name app & choose workspace

App Name

FORE Service

Don't worry - you'll be able to change this later.

Pick a workspace to develop your app in:

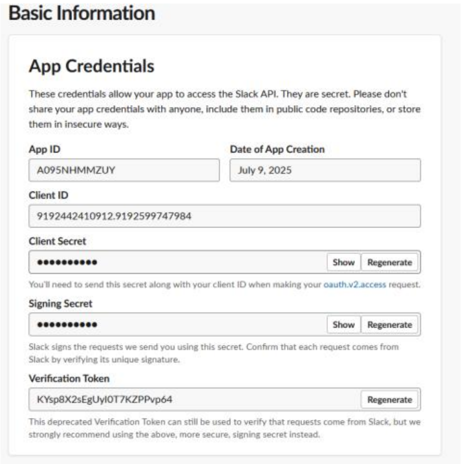
FORE School

Keep in mind that you can't change this app's workspace later. If you leave the workspace, you won't be able to manage any apps you've built for it. The workspace will control the app even if you leave the workspace.

Sign into a different workspace

By creating a **Web API Application**, you agree to the Slack API Terms of Service.

Figure 56: Fill it up and click Create App



Basic Information

App Credentials

These credentials allow your app to access the Slack API. They are secret. Please don't share your app credentials with anyone, include them in public code repositories, or store them in insecure ways.

App ID: A095NHMMZUY

Date of App Creation: July 9, 2025

Client ID: 9192442410912.9192599747984

Client Secret: ••••••••••

You'll need to send this secret along with your client ID when making your oauth.v2.access request.

Signing Secret: ••••••••••

Slack signs the requests we send you using this secret. Confirm that each request comes from Slack by verifying its unique signature.

Verification Token: KYsp8X2sEgUyl0T7KZPPvp64

This deprecated Verification Token can still be used to verify that requests come from Slack, but we strongly recommend using the above, more secure, signing secret instead.

Figure 57: Not sure if to note down these or not.

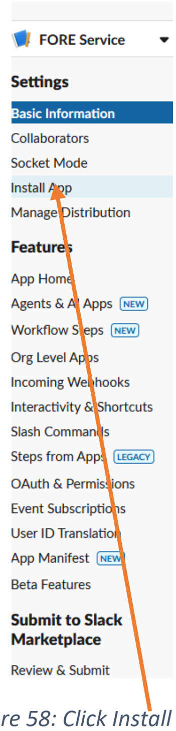
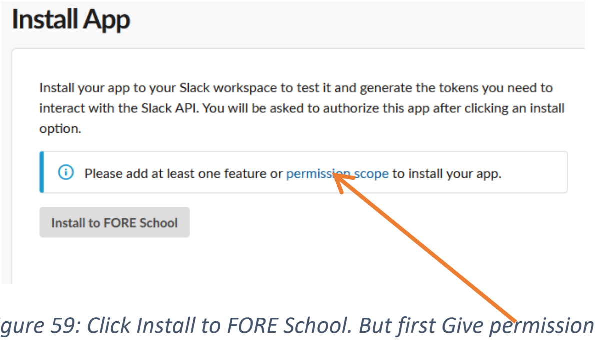


Figure 58: Click Install Apps

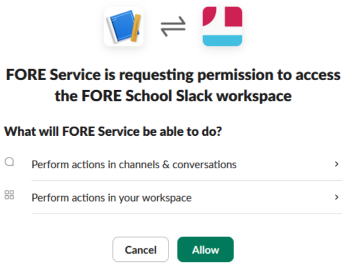


Install App

Install your app to your Slack workspace to test it and generate the tokens you need to interact with the Slack API. You will be asked to authorize this app after clicking an install option.

Please add at least one feature or permission scope to install your app.

Figure 59: Click Install to FORE School. But first Give permissions



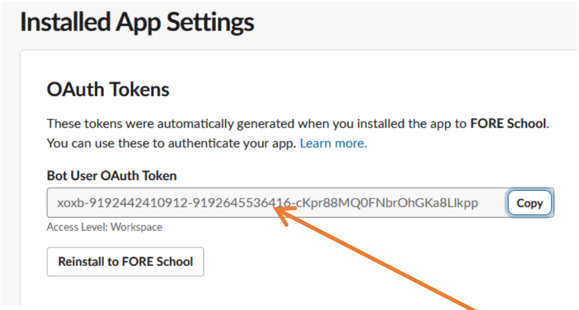
FORE Service is requesting permission to access the FORE School Slack workspace

What will FORE Service be able to do?

Perform actions in channels & conversations

Perform actions in your workspace

Figure 60: Allow your App permissions on your Workspace



Installed App Settings

OAuth Tokens

These tokens were automatically generated when you installed the app to **FORE School**. You can use these to authenticate your app. Learn more.

Bot User OAuth Token

xoxb-9192442410912-9192645536416-cKpr88MQ0FNbrOhGKa8Llkpp

Access Level: Workspace

Figure 61: A token will be generated. Note this down. This token is important.

xoxb-9192442410912-9192645536416-cKpr88MQ0FNbrOhGKa8Llkpp

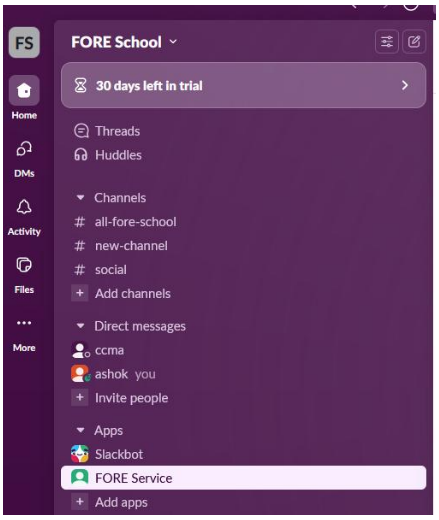
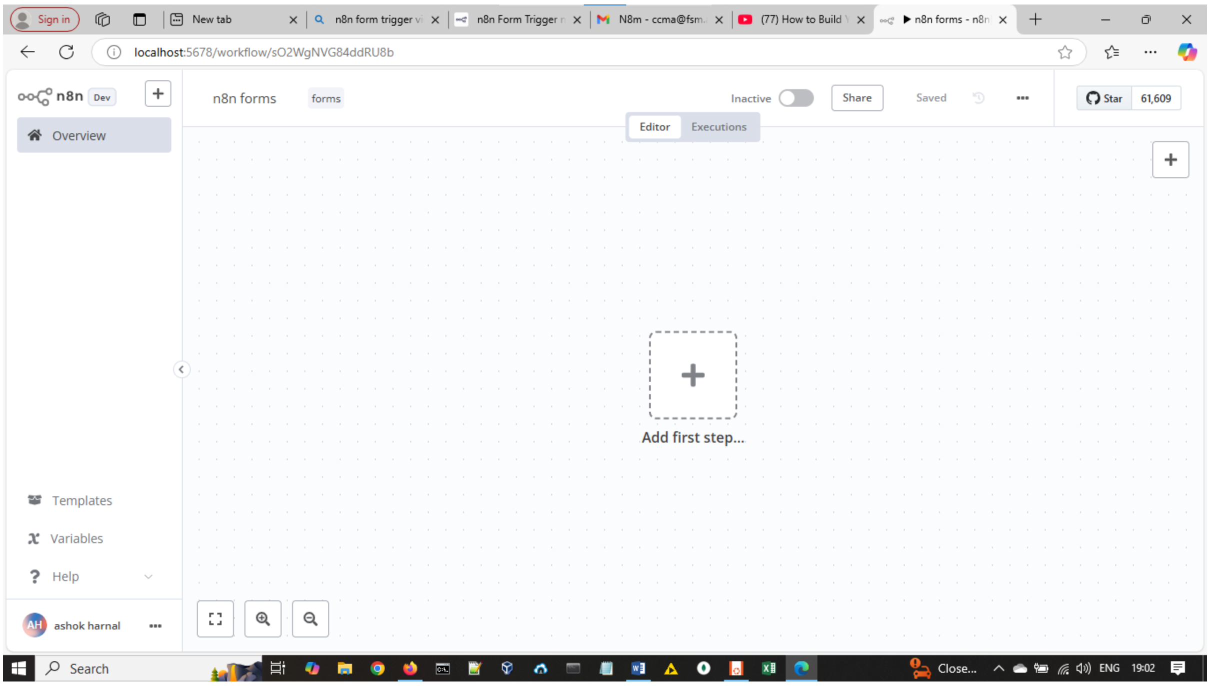
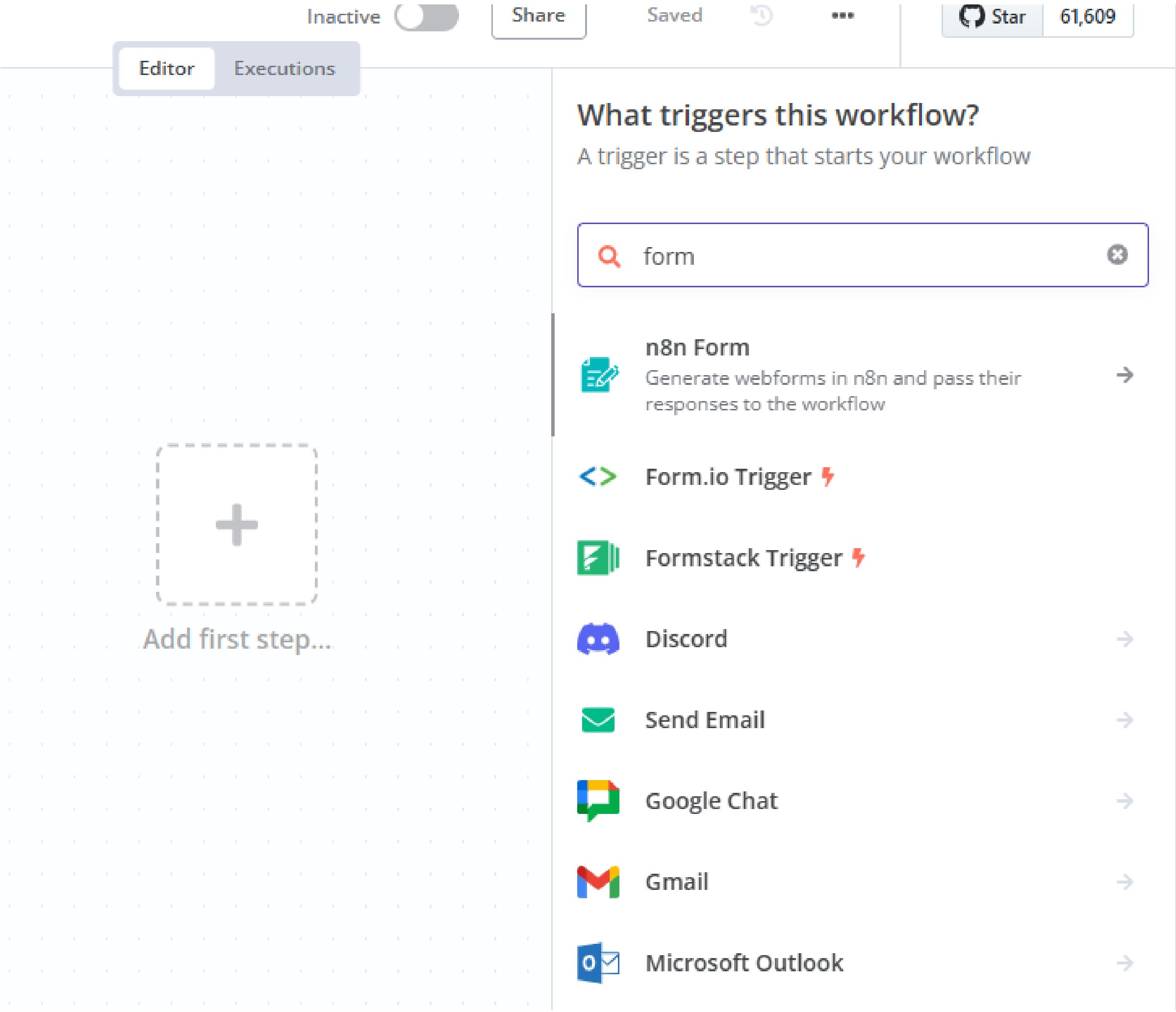


Figure 62: An App FORE Service is now visible

YouTube video





What triggers this workflow?

A trigger is a step that starts your workflow

form

n8n Form
Generate webforms in n8n and pass their responses to the workflow

Form.io Trigger

Formstack Trigger

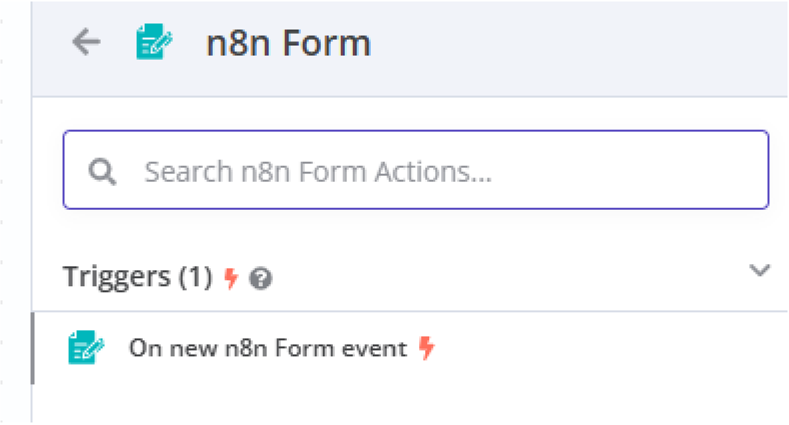
Discord

Send Email

Google Chat

Gmail

Microsoft Outlook



n8n Form

Search n8n Form Actions...

Triggers (1)

On new n8n Form event