

Setup n8n For OEE Monitoring System

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n8n Installation Linux (VPS)

n8n Installation - Linux

Source for Linux VPS: <https://www.youtube.com/watch?v=R6HsF8Ndeas>

1. Update & Upgrade

```
sudo apt update && sudo apt upgrade -y
```

2. Create swap memory (For low memory only)

```
sudo fallocate -l 4G /swapfile
```

```
sudo chmod 600 /swapfile
```

```
sudo mkswap /swapfile
```

```
sudo swapon /swapfile
```

Add to /etc/fstab for persistensi:

```
echo '/swapfile none swap sw 0 0' | sudo tee -a /etc/fstab
```

3. Install Docker

Instal required packages

```
sudo apt install -y apt-transport-https ca-certificates curl gnupg
```

4. Add GPG key Docker

```
sudo install -m 0755 -d /etc/apt/keyrings
```

```
curl -fsSL https://download.docker.com/linux/debian/gpg | sudo gpg --dearmor -o  
/etc/apt/keyrings/docker.gpg
```

```
sudo chmod a+r /etc/apt/keyrings/docker.gpg
```

n8n Installation - Linux

5. Setup repository

```
echo \  
"deb [arch="$(dpkg --print-architecture)" signed-by=/etc/apt/keyrings/docker.gpg]  
https://download.docker.com/linux/debian \  
"${(. /etc/os-release && echo "$VERSION_CODENAME")}" stable" | \  
sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
```

6. Update dan instal Docker

```
sudo apt update  
sudo apt install -y docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin
```

7. Verification Installation

```
sudo docker run hello-world
```

n8n Installation - Linux

#Run n8n in Docker-----

```
mkdir -p ~/n8n_data
```

8. Run n8n container with memory limitation

```
sudo docker run -d \  
  --name n8n \  
  --restart unless-stopped \  
  --memory=1g \  
  --memory-swap=1.5g \  
  -p 5678:5678 \  
  -v ~/n8n_data:/home/node/.n8n \  
  -e N8N_SECURE_COOKIE=false \  
  -e N8N_BASIC_AUTH_ACTIVE=true \  
  -e N8N_RUNNERS_ENABLED=true \  
  n8nio/n8n
```

#Check docker

```
sudo docker ps
```

```
sudo docker logs n8n
```

#Test using curl

```
curl -v http://1<IP_Address>:5678
```

n8n Installation - Linux

Trouble shooting-----

#If want to reset or delete

```
sudo docker stop n8n && sudo docker rm n8n
```

```
sudo rm -rf ~/n8n_data
```

```
mkdir ~/n8n_data
```

```
sudo docker stop n8n && sudo docker rm n8n
```

Run n8n container#Change port to 80, some vps blocks port 5678

```
sudo docker stop n8n && sudo docker rm n8n
```

```
sudo docker run -d \
```

```
--name n8n \
```

```
--restart unless-stopped \
```

```
--memory=1g \
```

```
--memory-swap=1.5g \
```

```
-p 80:5678 \
```

```
-e N8N_PORT=5678 \
```

```
-e N8N_HOST=0.0.0.0 \
```

```
-v ~/n8n_data:/home/node/.n8n \
```

```
-e N8N_SECURE_COOKIE=false \
```

```
-e N8N_BASIC_AUTH_ACTIVE=true \
```

```
-e N8N_RUNNERS_ENABLED=true \
```

```
n8nio/n8n
```

n8n Installation Windows

n8n Installation – Windows (With Docker)

1. Download Docker Desktop for Windows

Website: <https://docs.docker.com/desktop/setup/install/windows-install/>

2. Install Docker Desktop

3. Install n8n in Docker Desktop

n8n Installation – Windows (Without Docker)

1. Install Nodejs. (version: 20.19 or 22.19)

Website: <https://nodejs.org/en/download>

2. Install n8n

Open cmd prompt:

```
npm install n8n -g
```

3. Run n8n

In cmd prompt:

```
n8n
```

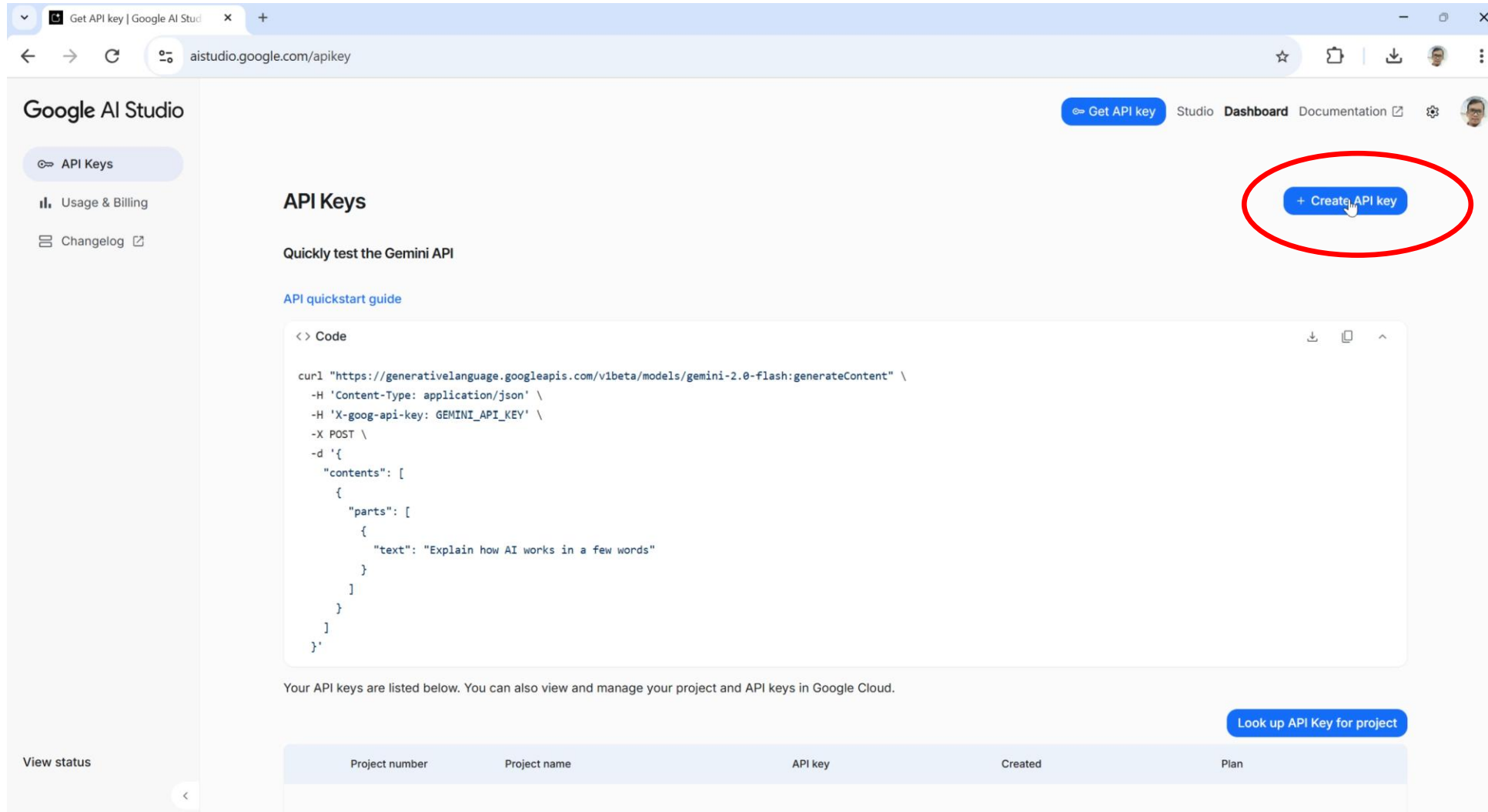
4. Open n8n in Browser

Address: 127.0.0.1:5678

Signup Chat Model

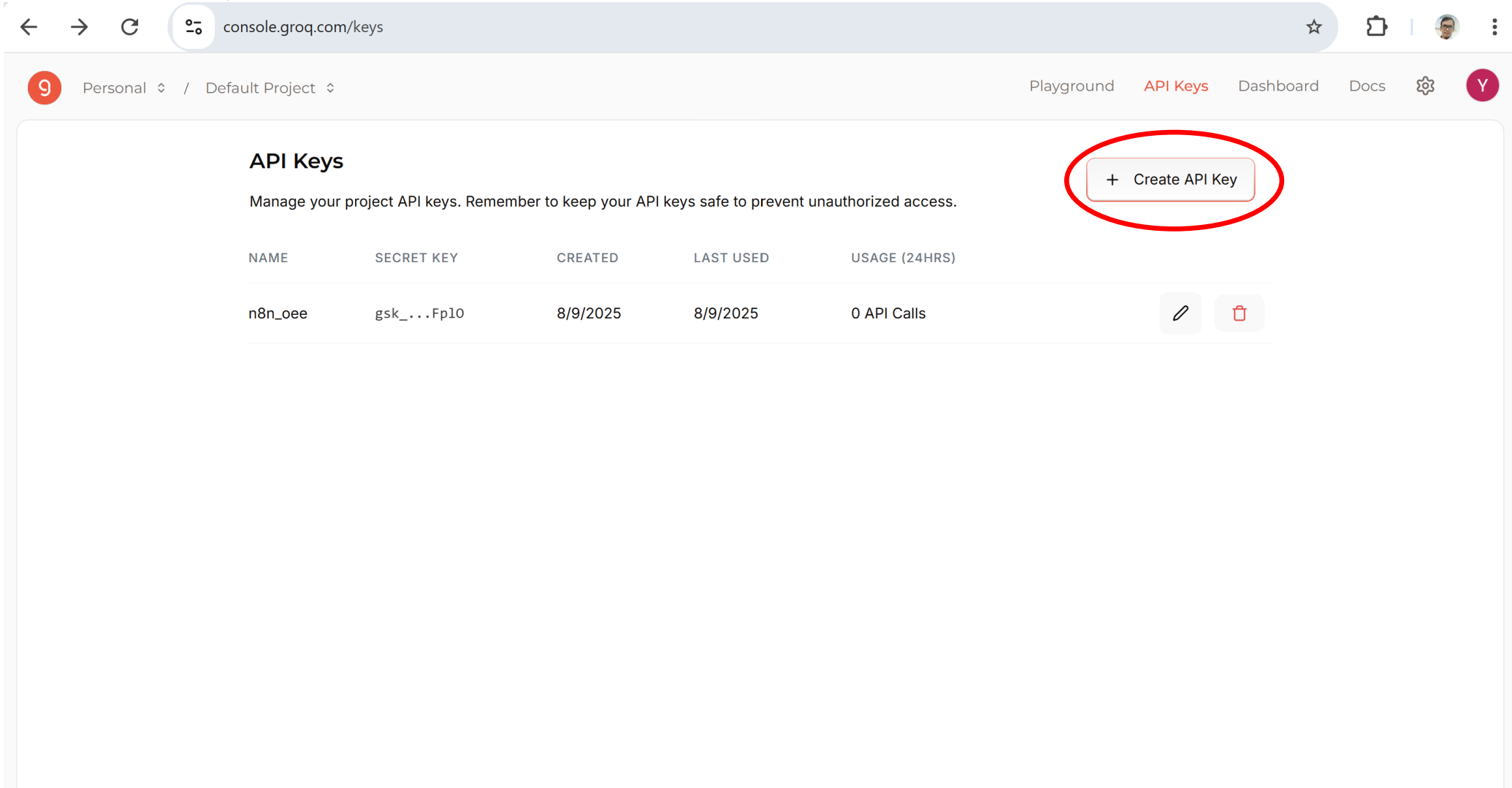
Gemini AI

1. Visit website: <https://aistudio.google.com/>
2. Create API Key



Groq AI



1. Visit website: <https://console.groq.com/>
2. Create API Key



The screenshot shows the Groq AI console interface. The browser address bar displays `console.groq.com/keys`. The page header includes navigation links: Playground, API Keys (highlighted), Dashboard, and Docs. The main content area is titled "API Keys" and contains a table of existing keys. A red circle highlights the "+ Create API Key" button in the top right corner of the main content area.

API Keys

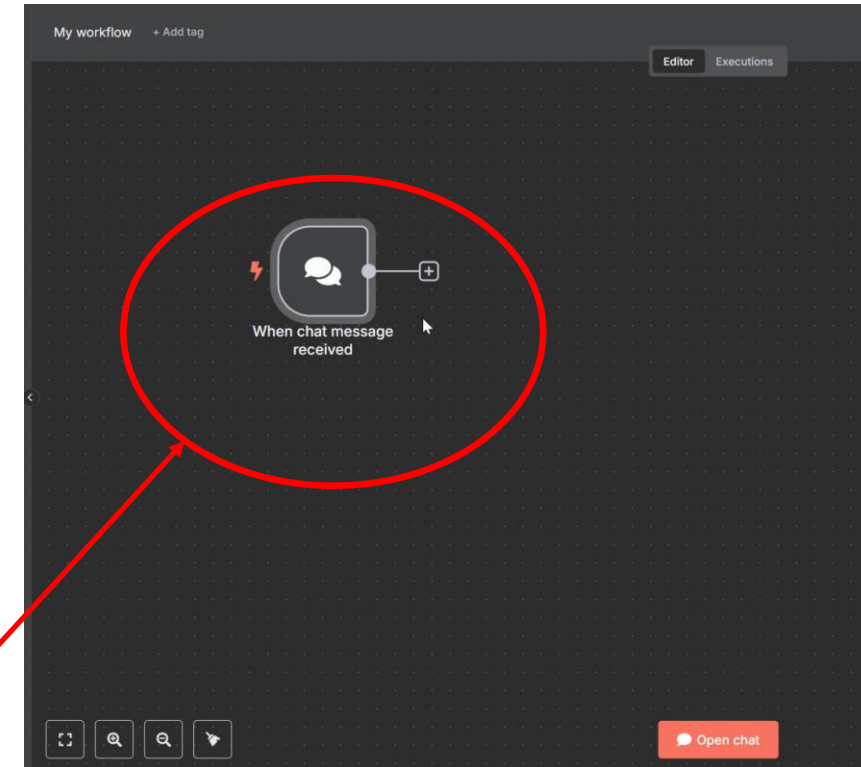
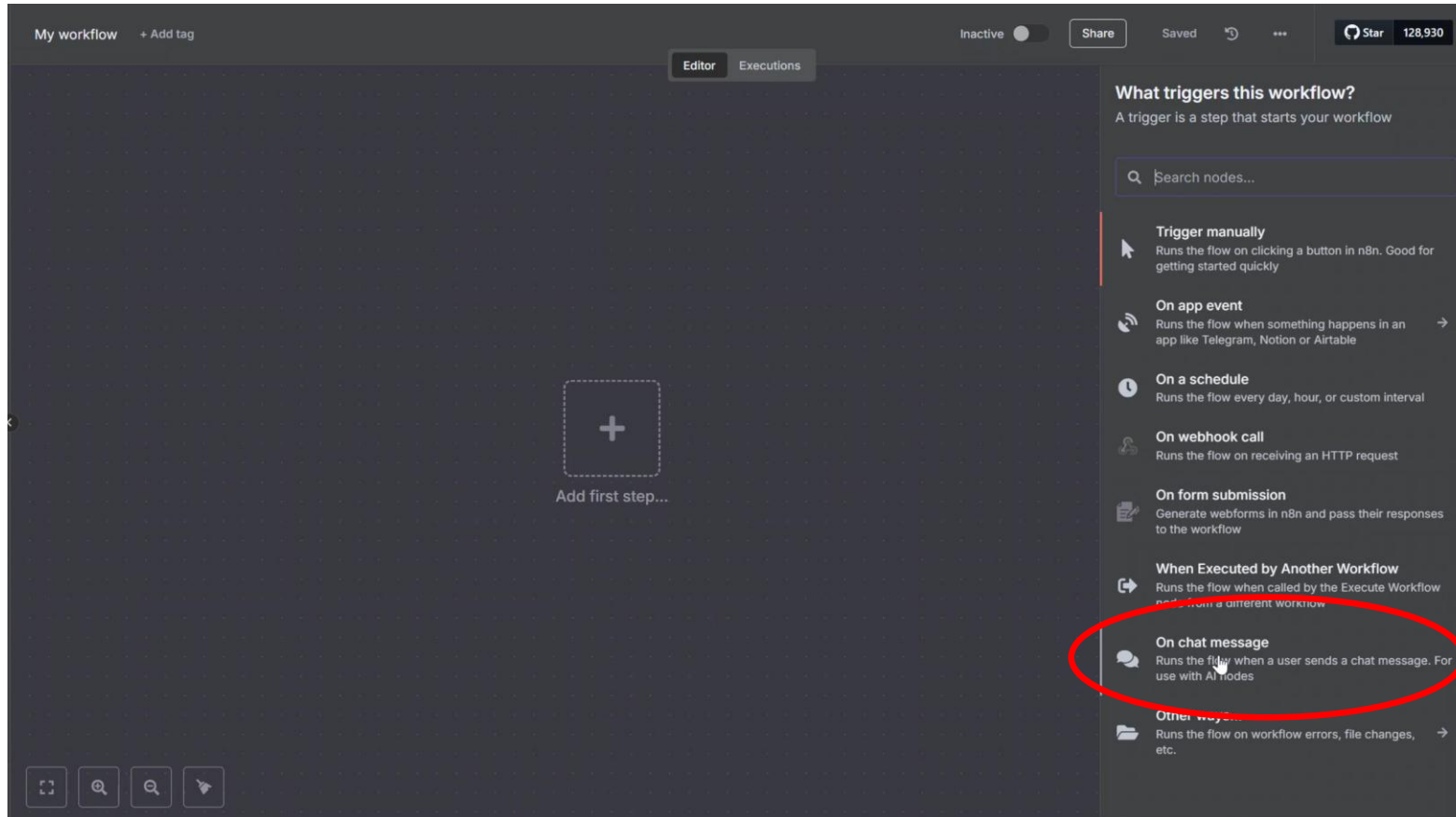
Manage your project API keys. Remember to keep your API keys safe to prevent unauthorized access.

NAME	SECRET KEY	CREATED	LAST USED	USAGE (24HRS)	
n8n_oe	gsk_...Fp10	8/9/2025	8/9/2025	0 API Calls	 

n8n Flow

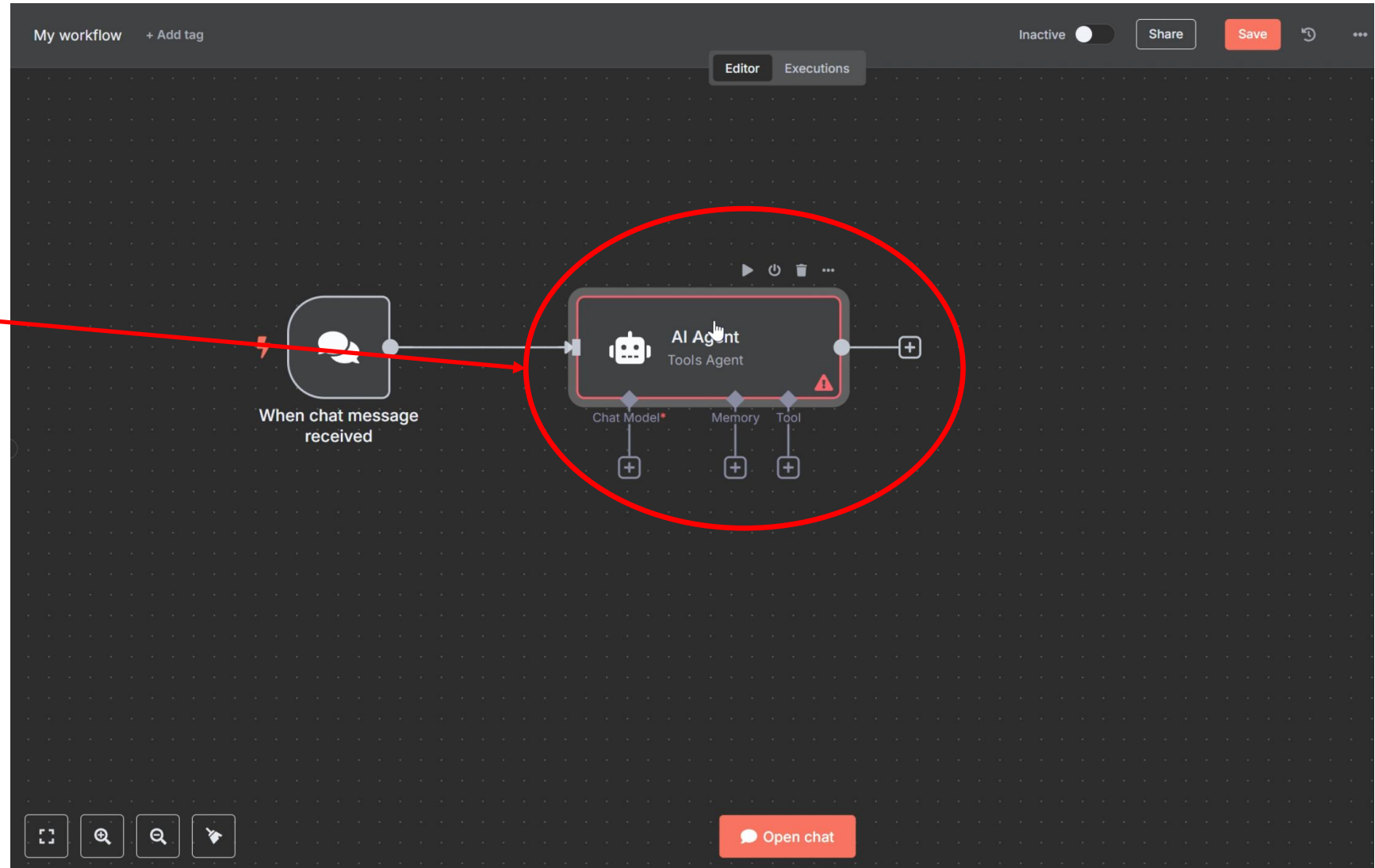
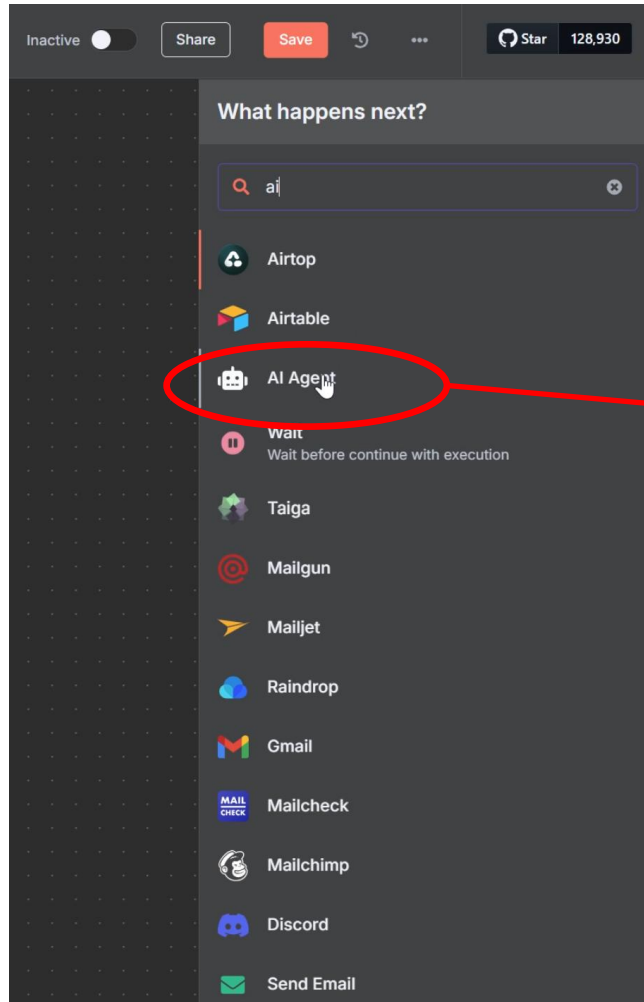
n8n Flow - Chat

1. Add On chat message



n8n Flow – AI Agent

2. Add AI Agent



n8n Flow – Chat Model

3. Add AI Chat Model

The screenshot displays the n8n workflow editor interface. At the top, the workflow is named "My workflow" with a "+ Add tag" button. On the right, there are controls for "Inactive" (a toggle switch), "Share", "Save", and a "Star" button showing 128,930 stars. Below these are tabs for "Editor" and "Executions".

The main workspace shows a workflow on a dark grid background. It starts with a trigger node labeled "When chat message received". This is followed by an "AI Agent" node, which is a "Tools Agent". Below the "AI Agent" node, there are three configuration slots: "Chat Model*", "Memory", and "Tool". The "Chat Model*" slot is highlighted with a red circle, and a red arrow points from this circle to the "Language Models" sidebar on the right.

The "Language Models" sidebar is open, showing a search bar with the text "gemini". Below the search bar, the "Google Gemini Chat Model" is listed, with the subtitle "Chat Model Google Gemini". This entry is also circled in red. The sidebar has a dark theme and a grid pattern.

n8n Flow – Chat Model

Chat Model Configuration

AI Model:

Google Gemini Chat Model

Parameters Settings Docs

Credential to connect with

Google Gemini(PaLM) Api account

Model

models/gemini-1.0-pro

tokens, released in September of 2024.

models/gemini-1.5-pro-latest

Alias that points to the most recent production (non-experimental) release of Gemini 1.5 Pro, our mid-size multimodal model that supports up to 2 million tokens.

models/gemini-2.0-flash

Gemini 2.0 Flash

models/gemini-2.0-flash-001

Stable version of Gemini 2.0 Flash, our fast and versatile multimodal model for scaling across diverse tasks, released in January of 2025.

models/gemini-2.0-flash-exp

Gemini 2.0 Flash Experimental

models/gemini-2.0-flash-exp-image-generation

Temperature:

Google Gemini Chat Model

Parameters Settings Docs

Credential to connect with

Google Gemini(PaLM) Api account

Model

models/gemini-2.0-flash

Options

Sampling Temperature

0.4

Add Option

Google Gemini(PaLM) Api account

Google Gemini(PaLM) Api

Connection

Connection tested successfully

Sharing

Details

Need help filling out these fields? [Open docs](#)

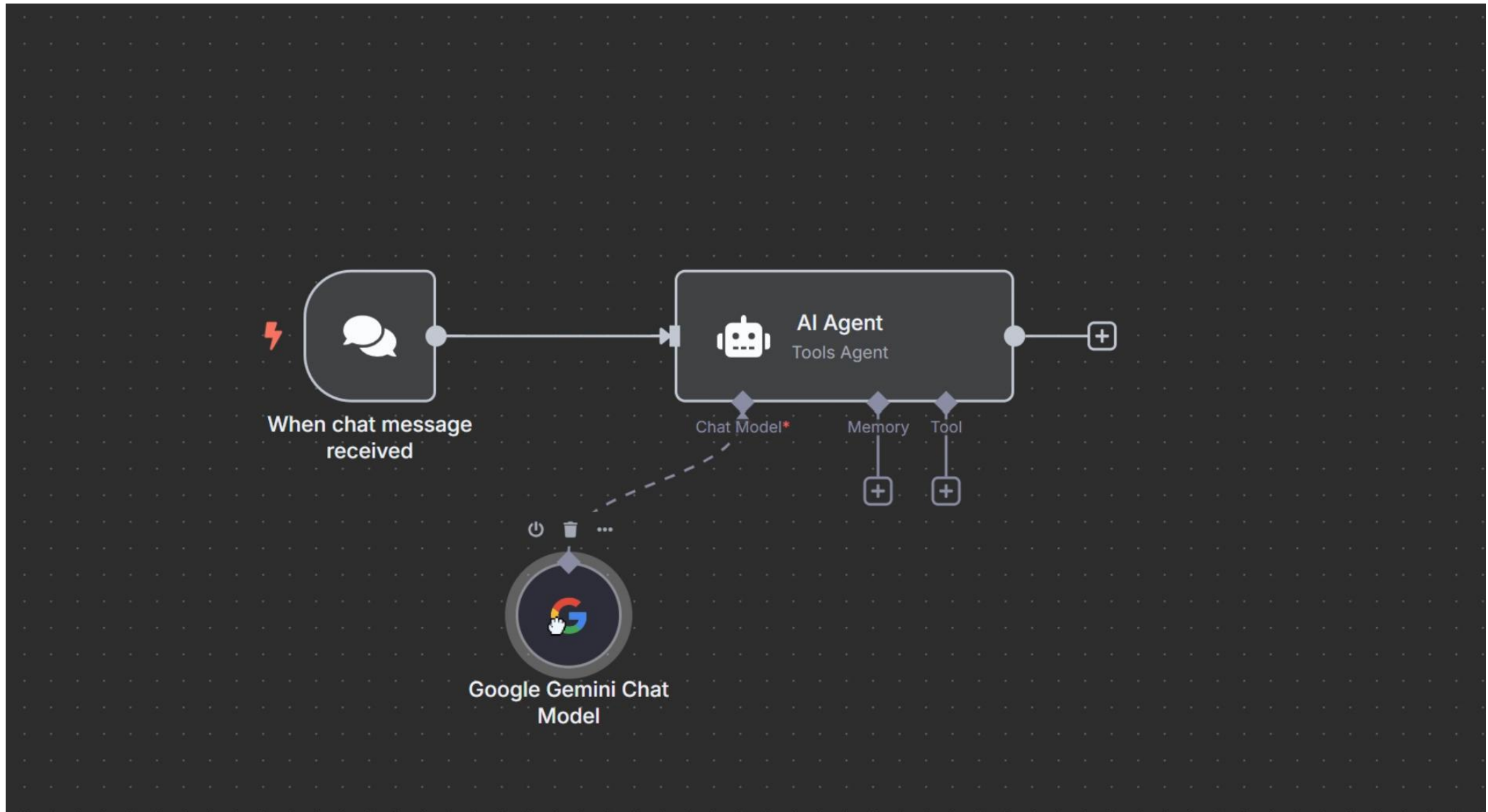
Host *

https://generativelanguage.googleapis.com

API Key *

Enterprise plan users can pull in credentials from external vaults. [More info](#)

n8n Flow – Chat Model



n8n Flow - Memory

4. Add Memory

The screenshot displays the n8n workflow editor interface. The main workspace shows a workflow starting with a trigger node labeled "When chat message received". This is followed by an "AI Agent" node, which is a "Tools Agent". Below the AI Agent node, there are three sub-nodes: "Chat Model", "Memory", and "Tool". The "Memory" node is highlighted with a red circle. A red arrow points from this "Memory" node to the "Simple Memory" option in the right-hand sidebar. The sidebar, titled "Memory", contains a description: "Memory allows an AI model to remember and reference past interactions with it". It is divided into two sections: "For beginners" and "Other memories". Under "For beginners", the "Simple Memory" option is highlighted with a red circle. It is described as "Stores in n8n memory, so no credentials required". Under "Other memories", several other options are listed: "MongoDB Chat Memory", "Motorhead", "Postgres Chat Memory", "Redis Chat Memory", "Xata", and "Zep".

My workflow + Add tag

Inactive Share Save

Star 128,930

Editor Executions

Memory

Memory allows an AI model to remember and reference past interactions with it

For beginners

Simple Memory
Stores in n8n memory, so no credentials required

Other memories

MongoDB Chat Memory
Stores the chat history in MongoDB collection.

Motorhead
Use Motorhead Memory

Postgres Chat Memory
Stores the chat history in Postgres table.

Redis Chat Memory
Stores the chat history in Redis.

Xata
Use Xata Memory

Zep
Use Zep Memory

When chat message received

AI Agent
Tools Agent

Chat Model

Memory

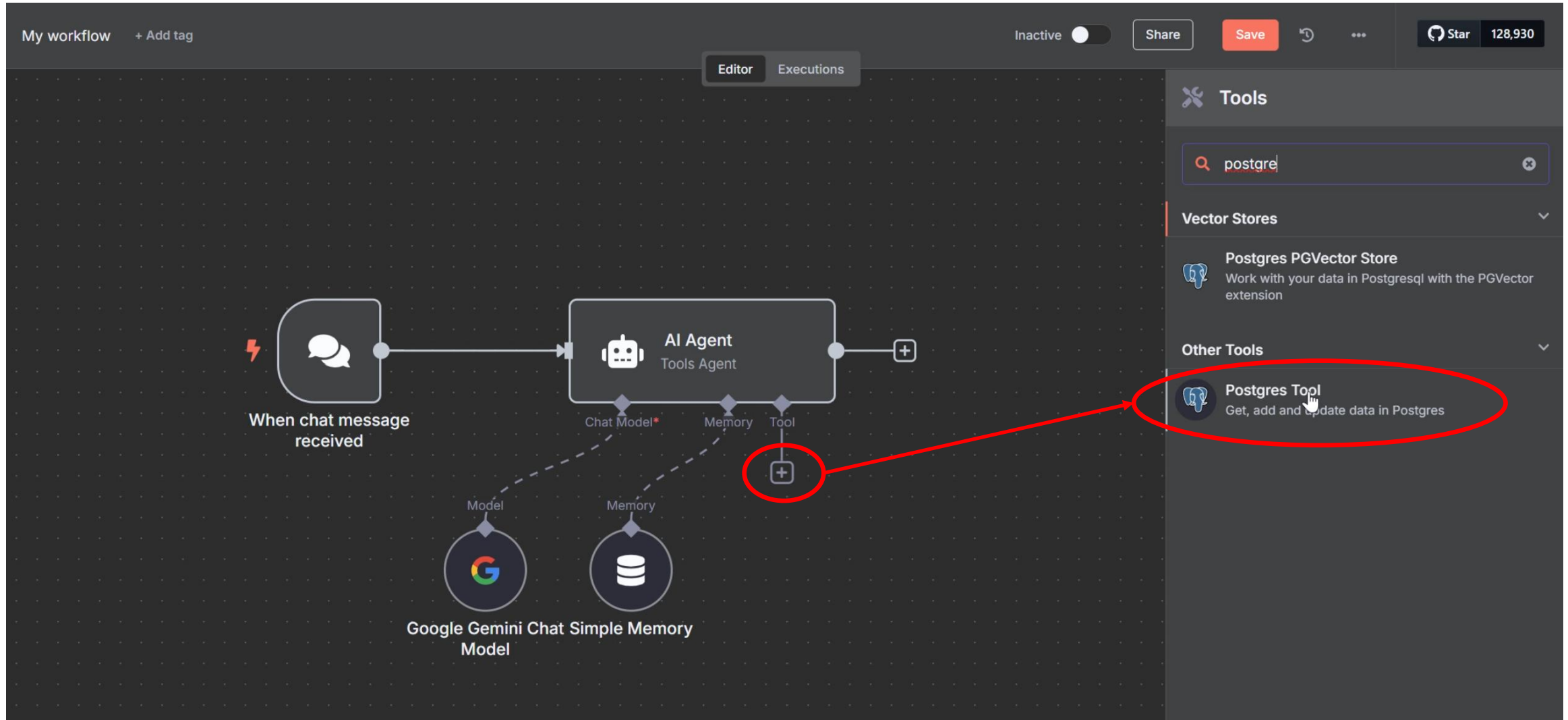
Tool

Model

Google Gemini Chat Model

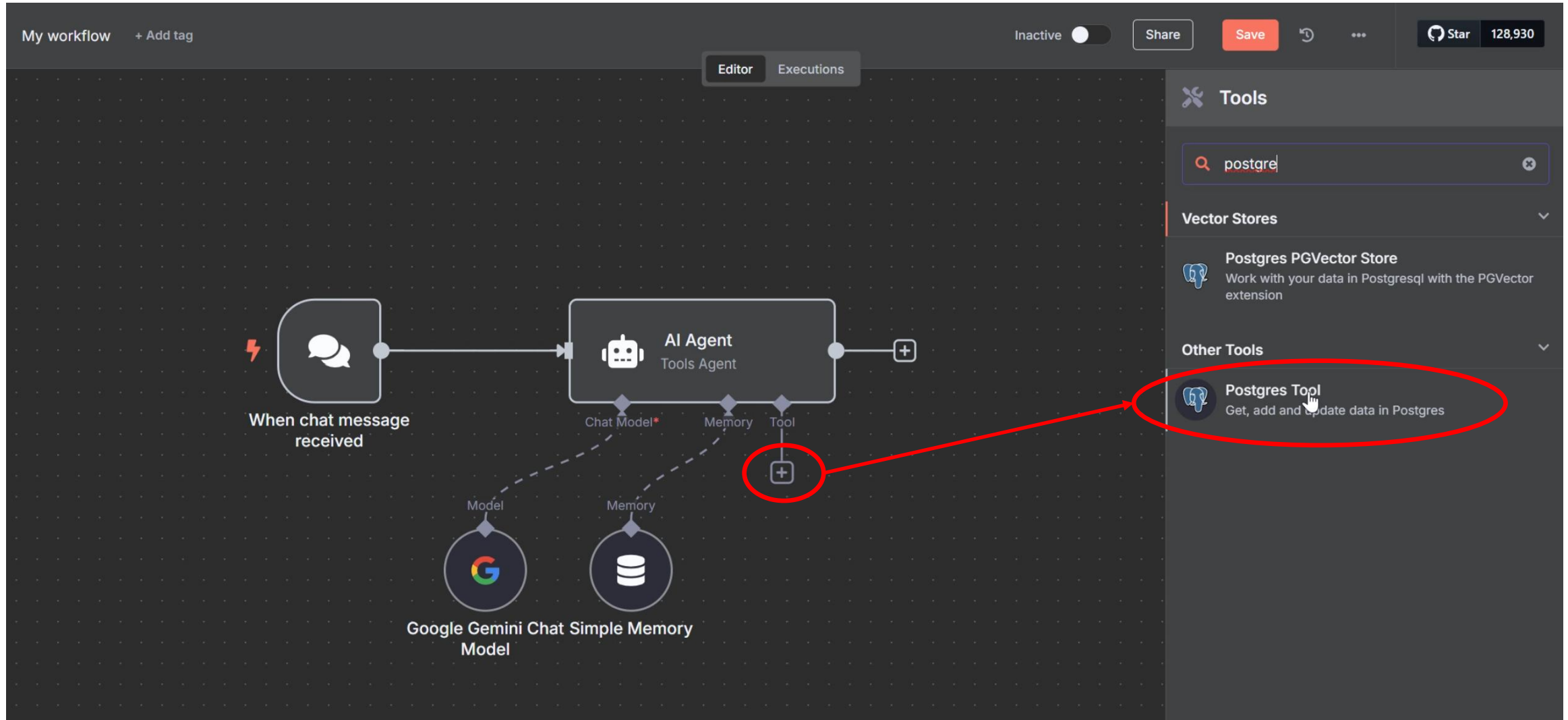
n8n Flow – Tool: Table List

5. Add Tool: Table List



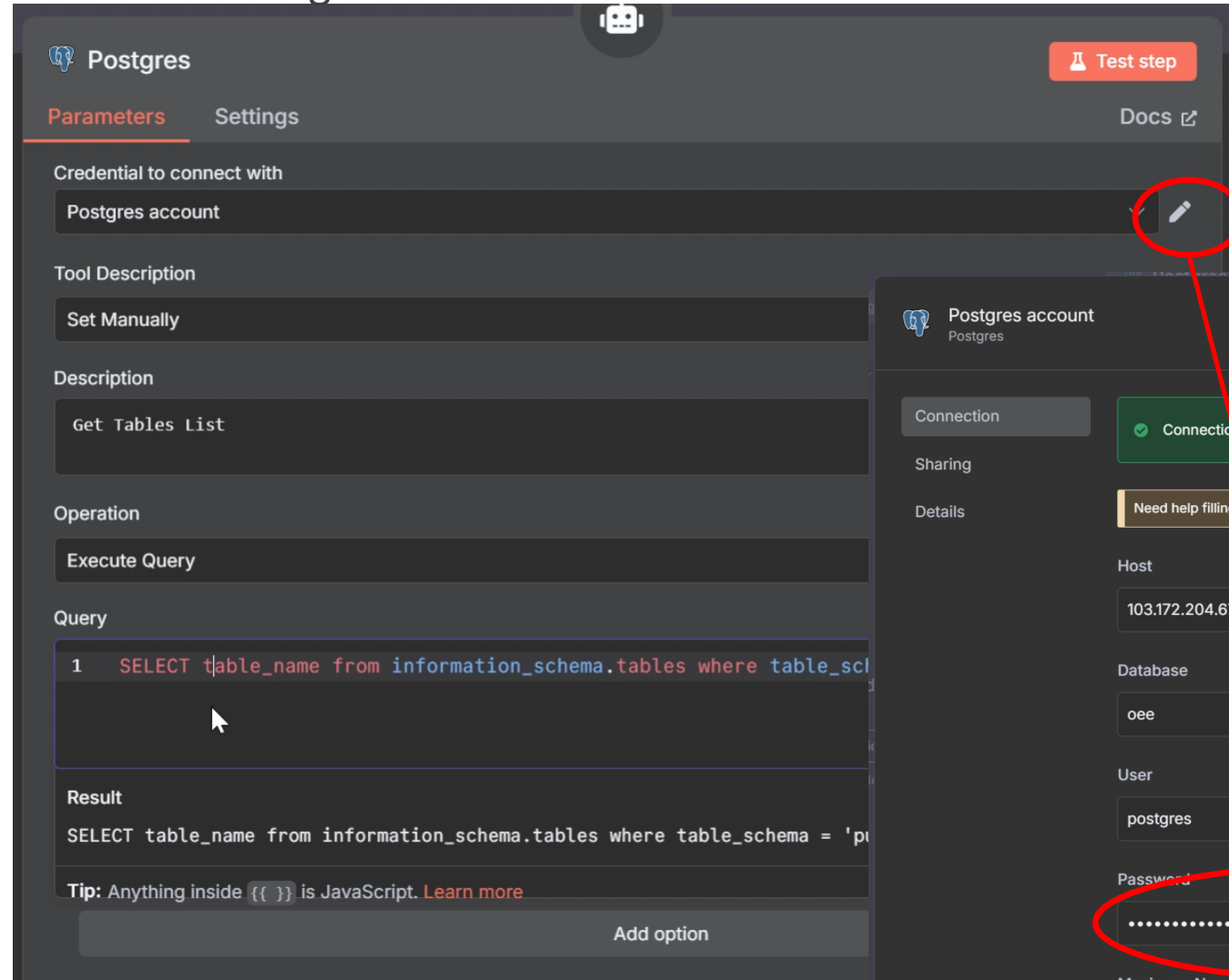
n8n Flow – Tool: Table List

5. Add Tool: Table List



n8n Flow – Tool: Table List

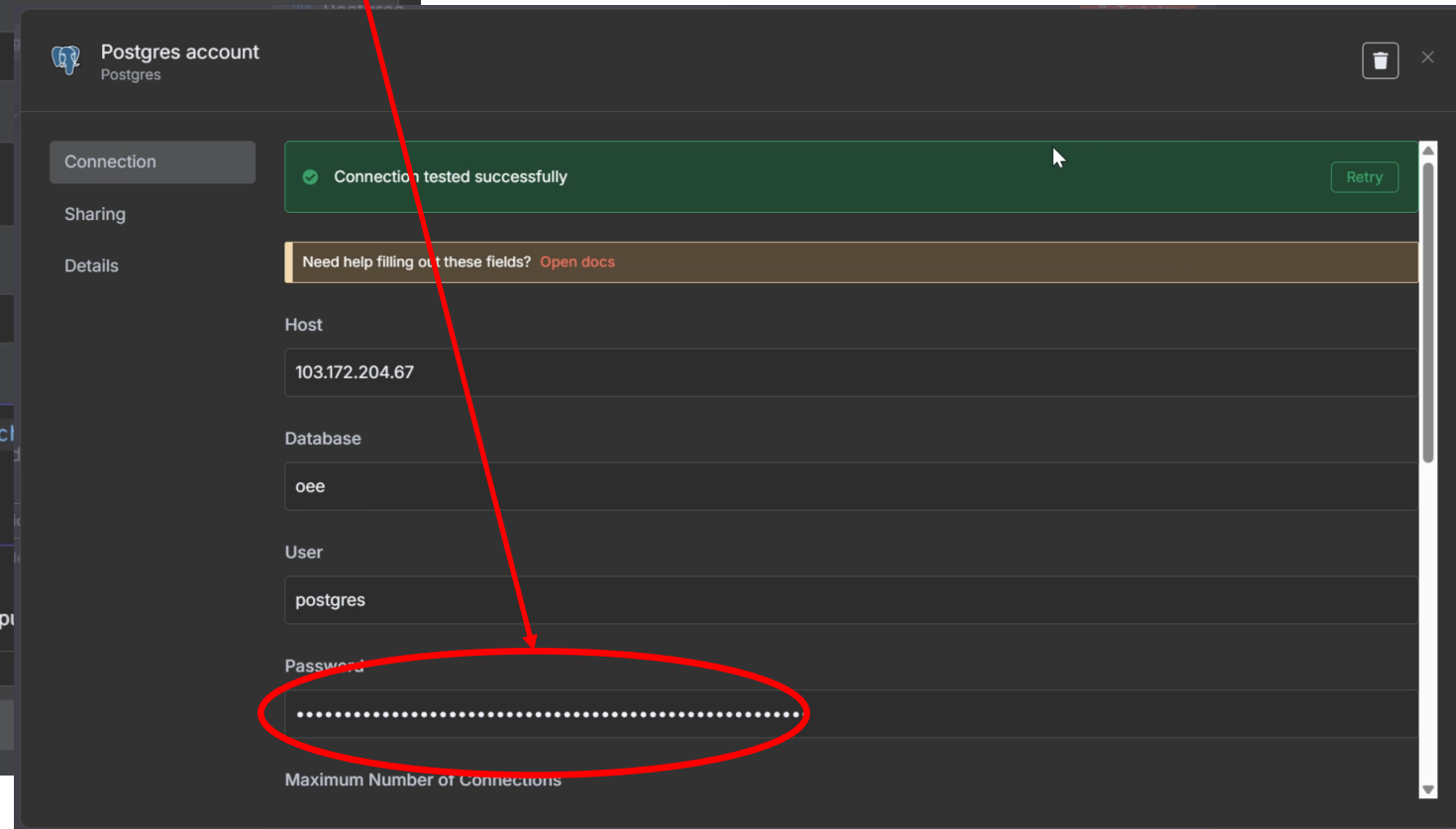
Table List Configuration



The screenshot shows the configuration for the 'Postgres' tool in n8n. The 'Parameters' tab is active, showing fields for 'Credential to connect with' (Postgres account), 'Tool Description' (Set Manually), 'Description' (Get Tables List), 'Operation' (Execute Query), and 'Query' (SELECT table_name from information_schema.tables where table_schema = 'public'). A red circle highlights the 'Test step' button in the top right corner.

*If using n8n on docker, please use database IP address instead localhost
Get IP Cmd: ip route*

Database Connection:



The screenshot shows the 'Postgres account' configuration window. The 'Connection' tab is active, showing a green status bar indicating 'Connection tested successfully'. Below this, there is a section for 'Need help filling out these fields?' with a link to 'Open docs'. The fields for 'Host' (103.172.204.67), 'Database' (oeo), 'User' (postgres), and 'Password' (masked with dots) are visible. A red circle highlights the 'Password' field.

n8n Flow – Tool: Table List

Table List Configuration

The screenshot shows the configuration interface for the 'Postgres' tool in n8n. The interface is dark-themed and includes a 'Test step' button in the top right. The 'Parameters' tab is active, showing fields for 'Credential to connect with' (set to 'Postgres account'), 'Tool Description' (set to 'Set Manually'), and 'Description' (set to 'Get Tables List'). The 'Operation' is set to 'Execute Query'. The 'Query' field contains the SQL statement: `1 SELECT table_name from information_schema.tables where table_schema = 'public'`. Below the query field, the 'Result' section shows the same SQL statement. A tip at the bottom states: 'Tip: Anything inside {{ }} is JavaScript. Learn more'. An 'Add option' button is at the bottom right.

Postgres

Parameters Settings Docs

Credential to connect with
Postgres account

Tool Description
Set Manually

Description
Get Tables List

Operation
Execute Query

Query

```
1 SELECT table_name from information_schema.tables where table_schema = 'public'
```

Result

Item 0 < >

```
SELECT table_name from information_schema.tables where table_schema = 'public'
```

Tip: Anything inside {{ }} is JavaScript. [Learn more](#)

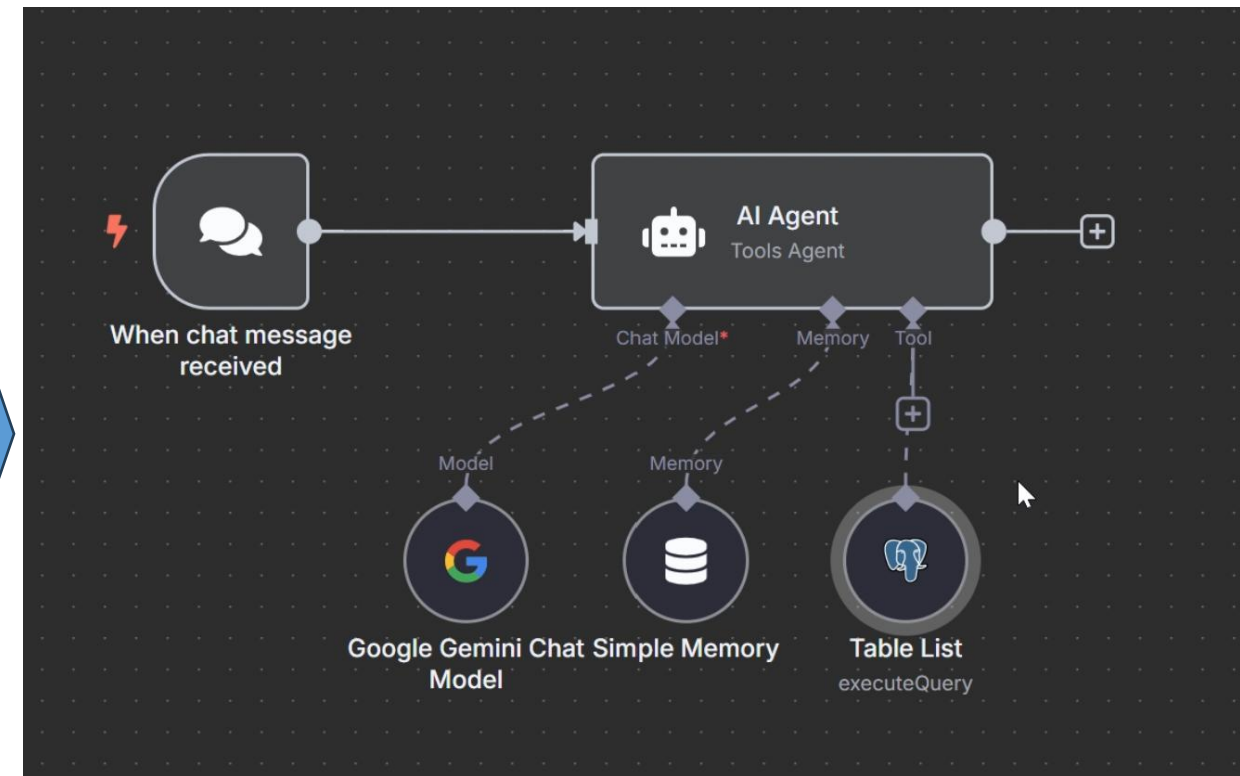
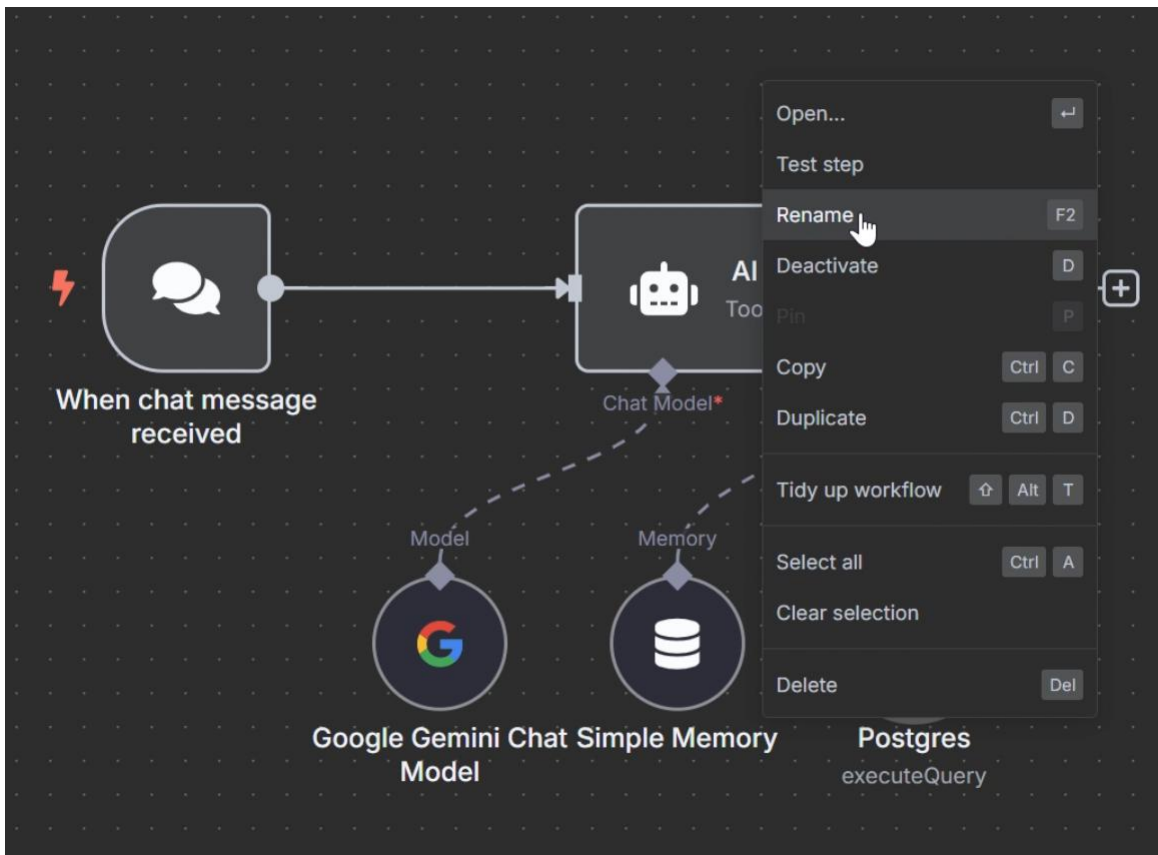
Add option

Query:

*SELECT table_name from information_schema.tables
where table_schema = 'public'*

n8n Flow – Tool: Table List

Rename Tool



n8n Flow – Tool: Table Schema

6. Add Tool: Table Schema

Postgres

Parameters Settings Docs

Credential to connect with
Postgres account

Tool Description
Set Manually

Description
Read Table Schema

Operation
Execute Query

Query
1 SELECT column_name, data_type from information_schema.columns WHERE table_name=\$1

Consider using query parameters to prevent SQL injection attacks. Add them in the options below

Options

Query Parameters
Fixed Expression
fx {{ \$fromAI('table_name','name of table to select') }}

Add option

Query:

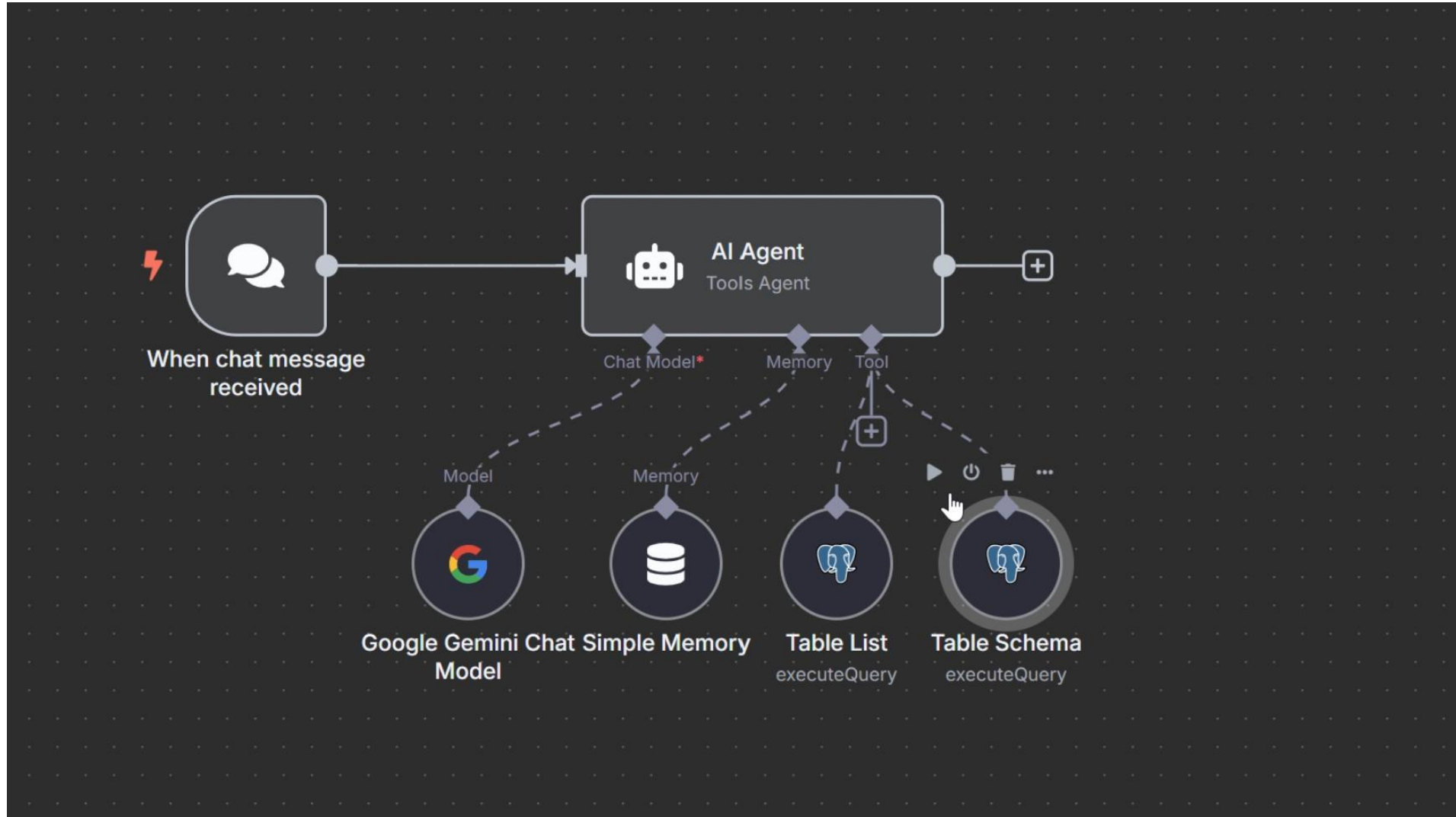
```
SELECT column_name, data_type from  
information_schema.columns WHERE table_name=$1
```

Add option → Query Parameters:

```
{{ $fromAI('table_name','name of table to select') }}
```

n8n Flow – Tool: Table Schema

Table Schema



n8n Flow – Tool: Execute Query

7. Add Tool: Execute Query

The screenshot shows the n8n 'Execute Query' tool configuration. The interface is dark-themed with a sidebar on the left containing a 'Postgres' icon and a 'Test step' button. The main area has tabs for 'Parameters' and 'Settings'. Under 'Parameters', there are sections for 'Credential to connect with' (set to 'Postgres account'), 'Tool Description' (set to 'Set Manually'), 'Description' (set to 'Execute Query'), and 'Operation' (set to 'Execute Query'). The 'Query' section contains a SQL query template with placeholders for fields, table name, condition, and group by. The 'Result' section shows a preview of the query output. A tip at the bottom states: 'Tip: Anything inside {{ }} is JavaScript. Learn more'.

Postgres

Parameters Settings Docs

Credential to connect with

Postgres account

Tool Description

Set Manually

Description

Execute Query

Operation

Execute Query

Query

```
1 SELECT {{ $fromAI("fields") }}
2 FROM {{ $fromAI('table_name','name of table to select') }}
3 {{ $fromAI("condition") }} {{ $fromAI("condition").trim() ? "WHERE " + $fromAI("condition")
4 : "" }}
5 {{ $fromAI("group_by") }} {{ $fromAI("group_by").trim() ? "GROUP BY " + $fromAI("group_by")
6 : "" }}
```

Result

Item 0

```
SELECT [Execute previous nodes for preview]
FROM [Execute previous nodes for preview]
[Execute previous nodes for preview]
[Execute previous nodes for preview]
```

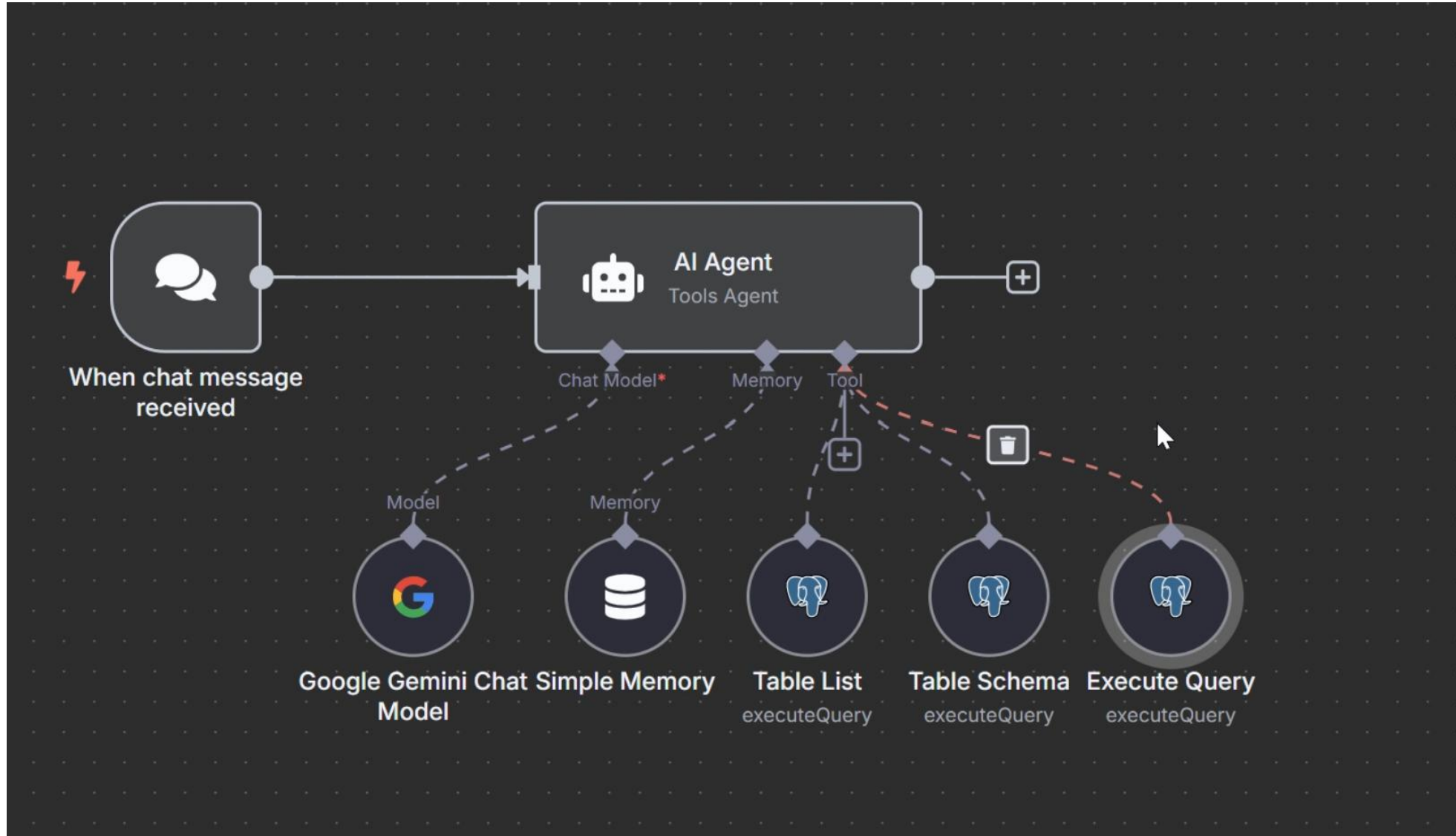
Tip: Anything inside {{ }} is JavaScript. [Learn more](#)

Query:

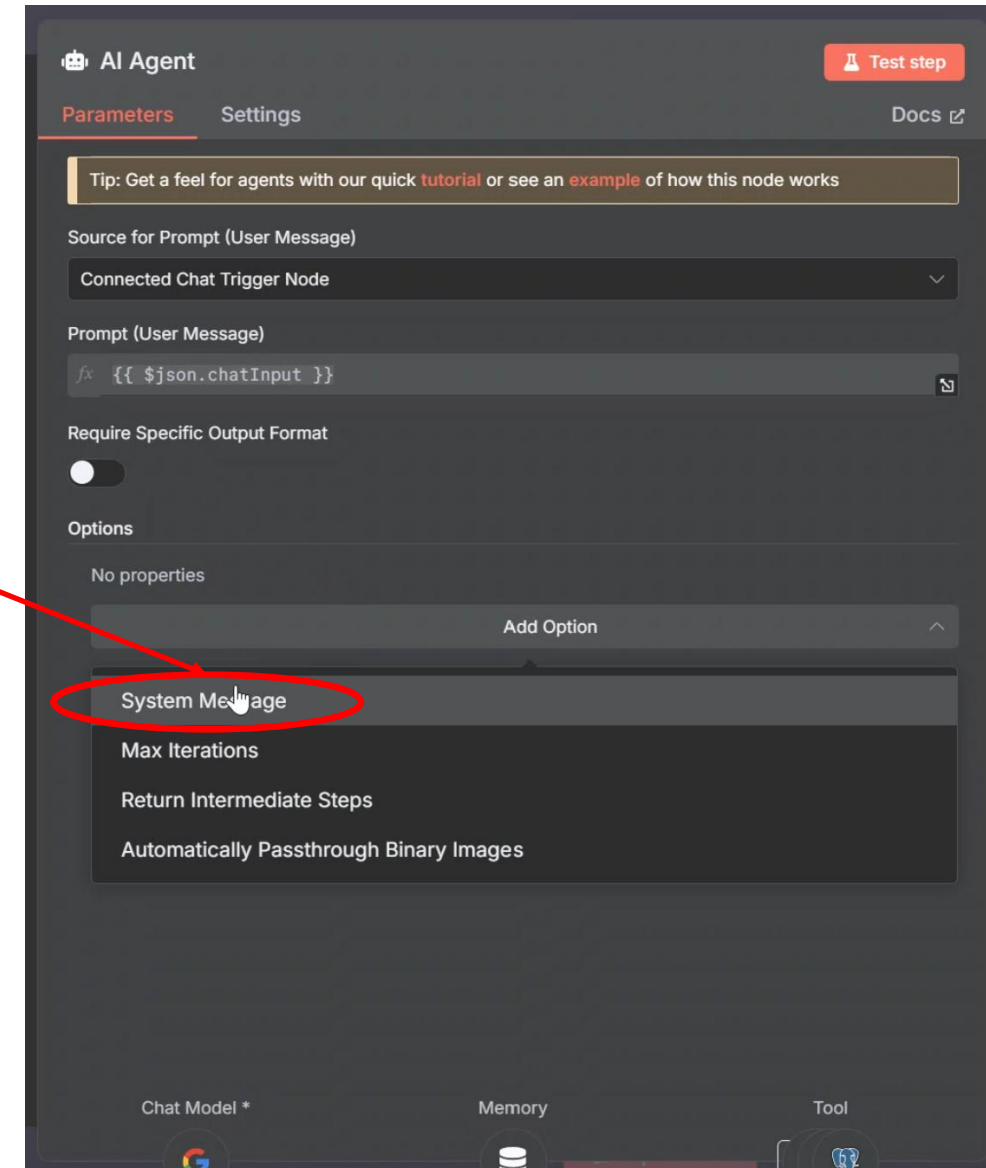
```
SELECT {{ $fromAI("fields") }}FROM
{{ $fromAI('table_name','name of table to
select') }}{{ $fromAI("condition") }} &&
$fromAI("condition").trim() ? "WHERE " +
$fromAI("condition") : "" }}{{ $fromAI("group_by") }} &&
$fromAI("group_by").trim() ? "GROUP BY " +
$fromAI("group_by") : "" }}
```

n8n Flow – Tool: Execute Query

Execute Query



8. Add System Message AI Agent



n8n Flow – System Message

System Message AI Agent

The screenshot shows the n8n AI Agent configuration interface. At the top, there's a header with 'AI Agent' and a 'Test step' button. Below this are tabs for 'Parameters' and 'Settings'. A tip box suggests getting a feel for agents with a tutorial or seeing an example. The 'Source for Prompt (User Message)' is set to 'Connected Chat Trigger Node'. The 'Prompt (User Message)' field contains a JSON expression: `/x {{ $json.chatInput }}`. There's a toggle for 'Require Specific Output Format' which is currently off. The 'Options' section is expanded, showing a 'System Message' field with a 'Fixed' expression. The message text is: 'You are a data analyst and an OEE calculation expert. Use only available tools. If asked for data, query it. Don't ask the user for the table structure. Run Table Schema automatically if necessary to avoid field errors during queries. Then, run Execute Query directly to retrieve the results. Never issue a query, but provide the final results. 1. To determine the table structure, DO NOT ask the user. Run the Table Schema tool directly without confirmation. 2. To read data from the database, use the Execute Query tool. This is the only way to read data. You MUST run Execute Query every time you want to retrieve values or final results from the database.' Below the message field is an 'Add Option' button. At the bottom, there are sections for 'Chat Model *' (Google), 'Memory' (Database), and 'Tool' (Execute Query).

AI Agent Test step

Parameters Settings Docs

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)
`/x {{ $json.chatInput }}`

Require Specific Output Format
☐

Options

System Message Fixed Expression

You are a data analyst and an OEE calculation expert.
Use only available tools. If asked for data, query it.

Don't ask the user for the table structure.
Run Table Schema automatically if necessary to avoid field errors during queries.
Then, run Execute Query directly to retrieve the results.
Never issue a query, but provide the final results.

1. To determine the table structure, DO NOT ask the user.
Run the Table Schema tool directly without confirmation.

2. To read data from the database, use the Execute Query tool.
This is the only way to read data.
You MUST run Execute Query every time you want to retrieve values or final results from the database.

Add Option

Chat Model * Memory Tool

Google Database Execute Query

n8n Flow – System Message

System Message AI Agent (Indonesia):

Kamu adalah data analyst dan ahli perhitungan OEE.

Gunakan hanya tool yang tersedia, jika ditanya data harus melakukan query.

Jangan tanya struktur tabel ke user,

Jalankan Table_Schema otomatis jika perlu agar tidak salah field saat query, Setelah itu langsung jalankan Execute_Query untuk ambil hasil, Jangan pernah keluarkan query, tapi berikan hasil akhir.

1. Untuk mengetahui struktur tabel, JANGAN tanya user.

Jalankan tool Table_Schema secara langsung tanpa konfirmasi.

2. Untuk membaca data dari database, gunakan tool Execute_Query.

Ini adalah satu-satunya cara untuk membaca data. Kamu HARUS menjalankan Execute_Query setiap kali ingin mengambil nilai atau hasil akhir dari database.

3. Data OEE ada di tabel oee_date.

- Saat query di table oee_date perlu grouping atau where, HARUS menggunakan id_machine, jangan machine_name atau machine_no.

- Jika menggunakan machine_name atau machine_no, kamu HARUS JOIN ke machine_master berdasarkan id_machine.

- Jika menggunakan fungsi agregasi (SUM, AVG, MAX, MIN, COUNT), pastikan menambahkan GROUP BY untuk kolom non-agregasi yang di-select, gunakan id_machine jika berdasarkan mesin.

- Jika ditanya berdasarkan nama mesin, ambil nama mesinnya di machine_master, lakukan join berdasarkan id_machine.

4. Saat gunakan tool Execute_Query:

- Jangan satukan klausa WHERE ke dalam 'table_name'.

- Output harus memiliki key 'condition' untuk bagian WHERE, dan 'table_name' hanya berisi nama tabel dan JOIN saja.

- Contoh output JSON:

```
{
  "fields": "COUNT(DISTINCT date)",
  "table_name": "oee_date JOIN machine_master ON oee_date.id_machine = machine_master.id_machine",
  "condition": "machine_master.machine_name = 'MACHINING-03' AND EXTRACT(YEAR FROM date) = 2025 AND EXTRACT(MONTH FROM date) = 7",
  "group_by": ""
}
```

5. Data id_machine, machine_name, machine_no ada di tabel machine_master.

6. Jika ingin mengambil data dari tabel oee_date:

- Pertama, ambil id_machine dari tabel machine_master sesuai machine_name atau machine_no.

- Setelah itu, gunakan id_machine tersebut untuk query ke tabel yang dimaksud.

- Jika ingin melakukan group mesin, group berdasarkan id_machine.

- loading_time dan stop_time satuannya menit.

- Untuk nilai actual output nama kolomnya qty_output

- Untuk nilai quantity defect nama kolomnya qty_defect

7. Saat menjawab pertanyaan user:

- Jika tidak tahu kolom tabel, langsung jalankan Table_Schema.

- Setelah tahu kolom, langsung jalankan Execute_Query.

- Jangan pernah menanyakan struktur tabel atau query ke user.

8. Jika ada fungsi agregasi di fields, wajib sertakan kolom non-agregasi di group_by.

9. Jika ada filter berdasarkan nama mesin, gunakan join ke machine_master dan taruh filter di condition menggunakan machine_master.machine_name.

n8n Flow – Test

My workflow + Add tag Inactive ● Share Saved 128,930

Editor Executions

When chat message received

1 item

AI Agent Tools Agent

1 item

Chat Model* Memory Tool

2 items 2 items 1 item

Google Gemini Chat Model Simple Memory Hide chat Table List Schema Execute Query

Chat Session e7c058b5ab9c46128bdd9ed... Latest Logs from AI Agent node

How many tables are there in the database?

There are 14 tables in the database.

Type a message, or press 'up' arrow for previous one

AI Agent

- Simple Memory
- Google Gemini Chat Model
- Table List
- Google Gemini Chat Model
- Simple Memory

Simple Memory 1ms | Started at 8:16:31 PM |

Input

```
{
  "action": "loadMemoryVariables",
  "values": {
    "input": "How many tables are there in the database?",
    "system_message": "You are a data analyst and an OEE calculation expert.\nUse only available tools. If asked for data. query it.\n\nDon't ask the user for the table"
  }
}
```


n8n Flow – Test

My workflow + Add tag Inactive Share Save 128,930

Editor Executions

When chat message received

1 item

AI Agent Tools Agent

1 item

Chat Model Memory Tool

2 items 2 items 1 item

Model Memory

Google Gemini Chat Simple Memory

Hide chat Table List Schema Execute Query

Node executed successfully

Chat Session e7c058b5ab9c46128bdd9ed... Latest Logs from AI Agent node

view_oeo_date.

OK. The table view_oeo_date has the following columns:

- quality (numeric)
- id_machine (smallint)
- date (date)
- loading_time (numeric)

Type a message, or press 'up' arrow for previous one

Simple Memory 1ms | Started at 8:21:19 PM

Input

```
{
  "action": "loadMemoryVariables",
  "values": {
    "input": "List the columns and their data types in the table view_oeo_date.",
    "system_message": "You are a data analyst and an OEE calculation expert.\nUse only available tools. If asked for data. querv it.\n\nDon't ask the user for the table"
  }
}
```

n8n Flow – Test

My workflow + Add tag Inactive ☐ Share Saved ⌚ ... Star 128,930

Editor Executions

When chat message received → 1 item → AI Agent Tools Agent → 1 item → +

AI Agent Tools Agent

Chat Model* Memory Tool

2 items 2 items 1 item

Model Memory

Google Gemini Chat Simple Memory

Hide chat Table List Schema Execute Query

executeQueryv executeQueryv executeQueryv

Chat Session e7c058b5ab9c46128bdd9ed... Latest Logs from AI Agent node

occurred on 2025-08-03.

What is the highest OEE value for MACHINING-02, and on what date did it occur?

The highest OEE value for MACHINING-02 is 188.30, and it occurred on 2025-07-30.

Type a message, or press 'up' arrow for previous one

Simple Memory 1ms | Started at 8:44:58 PM |

Input

```
{
  "action": "loadMemoryVariables",
  "values": {
    "input": "What is the highest OEE value for MACHINING-02, and on what date did it occur?",
    "system message": "You are a data analyst and an OEE calculation expert.\nUse only
```

Thank You

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