Integration of Power Platform with Azure OpenAI Labs

Overview

1. **Seamless Integration:** Azure Open AI provides seamless integration with Power Platform's low-code development environment, allowing users to easily incorporate AI capabilities into their applications and workflows. This integration eliminates the need for complex coding and enables users to enhance productivity by leveraging AI without extensive programming knowledge.
2. **Pre-built AI Models**: Azure Open AI offers a wide range of pre-built AI models that can be readily integrated into Power Platform applications. These models cover various domains such as natural language processing, image recognition, sentiment analysis, and more. By utilizing these pre-built models, users can quickly add advanced AI capabilities to their low-code applications, saving time and effort in developing AI algorithms from scratch.
3. **Custom AI Models:** In addition to pre-built models, Azure Open AI enables users to train and deploy their own custom AI models within the Power Platform environment. This empowers users to address specific business requirements and build AI solutions tailored to their unique needs. With low-code development and Azure's powerful AI capabilities, users can improve productivity by rapidly developing and deploying custom AI models without extensive coding expertise.
4. **Data Integration and Analysis:** Azure Open AI provides seamless data integration capabilities, allowing users to connect Power Platform applications with various data sources, both on-premises and in the cloud. This integration enables users to leverage AI algorithms to analyze and extract insights from large volumes of data, enhancing productivity by automating data processing tasks and generating valuable insights for decision-making.
5. **AI-Driven Automation:** With Azure Open AI and Power Platform's low-code capabilities, users can create intelligent workflows and automate repetitive tasks using AI algorithms. For example, they can build chatbots for customer support, automate document processing and analysis, or develop predictive models for forecasting. By automating these tasks, users can significantly improve productivity, streamline operations, and allocate resources more efficiently.

Overall, the combination of **Azure Open** AI and **Power Platform's low-code development environment** empowers users to **harness the power of AI to improve productivity**. Whether through pre-built models, custom AI development, data integration, or automation, this **integration offers a streamlined and efficient approach to incorporating AI capabilities** into applications and workflows.

Prerequisites

Azure OpenAI Prerequires

1. **Registration:** Begin by registering for Azure Open AI by visiting the following link: Azure Open AI Registration. This registration process will provide you access to the Azure Open AI service.

2. **Resource Creation**: After your registration is approved, log in to the Azure portal and create an Azure Open AI resource. This resource will serve as the foundation for utilizing the Azure Open AI capabilities within your applications and workflows.

3. **Region Selection**: During the resource creation process, ensure that you select the US and Europe **region** as your preferred region. Choosing the correct region will ensure you have access to the desired AI capabilities. On **01 June 2023**, these regions are supported.

    a) East US

    b) South Central US

    c) West Europe

    d) France Central

4. **Resource Deployment:** Once the Azure Open AI resource is successfully created, proceed to create a deployment within the resource. This deployment allows you to configure and manage the specific AI models and services you want to utilize. You can customize the deployment based on your requirements and the specific AI capabilities you want to incorporate into your applications.

5. **Utilization and Integration:** With the deployment set up, you can now start utilizing the Azure Open AI services within your applications and workflows. This includes integrating the AI models, leveraging the available APIs and SDKs, and utilizing the AI capabilities to enhance productivity, automate tasks, and gain valuable insights from your data.

Power Platform Requirements

1. **Power Platform Developer Plan**
   Build and test Power Apps for free.

    a. Free for development and testing
    Create apps and flows without writing code with full-featured Power Apps and Power Automate development tools. Easily share and collaborate with others.

    b. Developer-friendly
    Connect to data sources, including Azure, Dynamics 365, and custom APIs, with premium connectors. Create additional environments to exercise application lifecycle management and CI/CD

    c. Dataverse included.

Save time with a fully managed, scalable, Azure-backed data platform, including support for common business app actions. Use out-of-the-box common tables or easily build your own data schema.

d. Connect to data sources, including Azure, Dynamics 365, and custom APIs, with premium connectors. Create additional environments to exercise application lifecycle management and CI/CDcc
Cc

2. Power Apps pricing tiers

   This is retail pricing Pricing - Power Apps (microsoft.com)

3. Power Automate pricing tier

   This is retail pricing Pricing | Microsoft Power Automate

Azure OpenAI

Scenarios

1. **Low-Code Development:** Building a **Power Apps** to create a demo or **personal knowledge** bot offers the advantage of a low-code development environment. Power Apps provides a visual interface with drag-and-drop functionality, making it accessible for users with varying levels of technical expertise. This empowers individuals without extensive coding knowledge to design and develop their own knowledge bots, reducing the reliance on dedicated development resources.

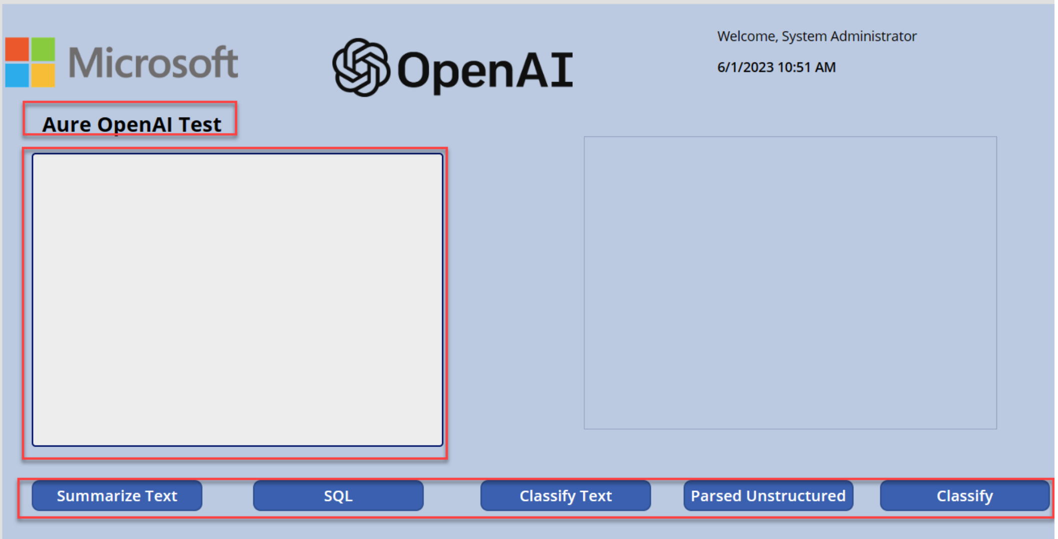
2. **Integration with Data Sources:** Power Apps allows you to seamlessly integrate with various data sources to enhance the functionality of your knowledge bot. You can connect your **Power App to Azure OpenAI service** and display relevant information. This integration enables your knowledge bot to provide accurate responses by pulling data from trusted sources, ensuring that users receive up-to-date and reliable information.

3. **User-Friendly Interface**: Power Apps enables you to design a user-friendly interface for your demo or personal knowledge bot. You can customize the look and feel of the app, including the **layout, colors, and branding, to create an engaging and visually appealing experience for your users**. With the ability to incorporate multimedia elements such as images, videos, and interactive controls, you can deliver a more interactive and immersive knowledge bot experience.

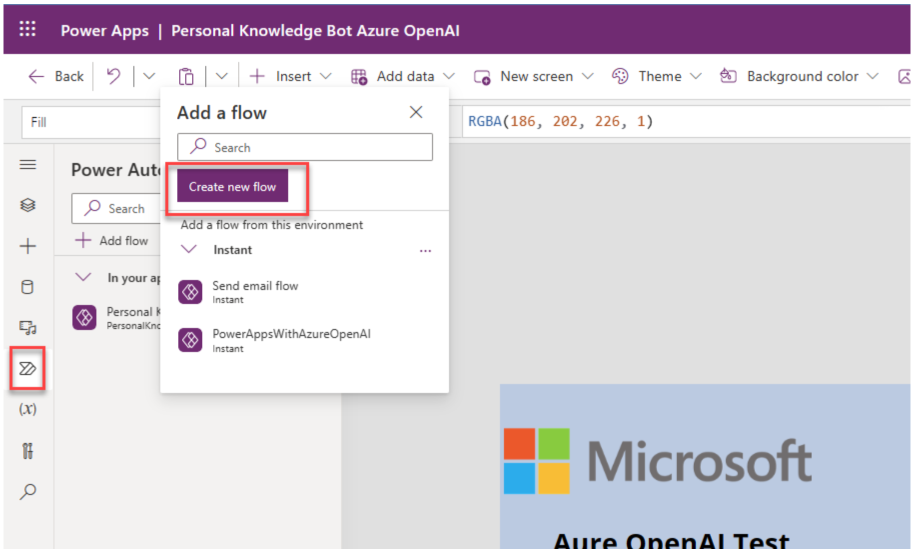
By leveraging the low-code development capabilities of Power Apps and its seamless integration with data sources, you can create a powerful and functional demo or personal knowledge bot. The user-friendly interface allows you to design an intuitive and visually appealing experience, ensuring that users can easily interact with the bot and access the information they need.

Power Apps

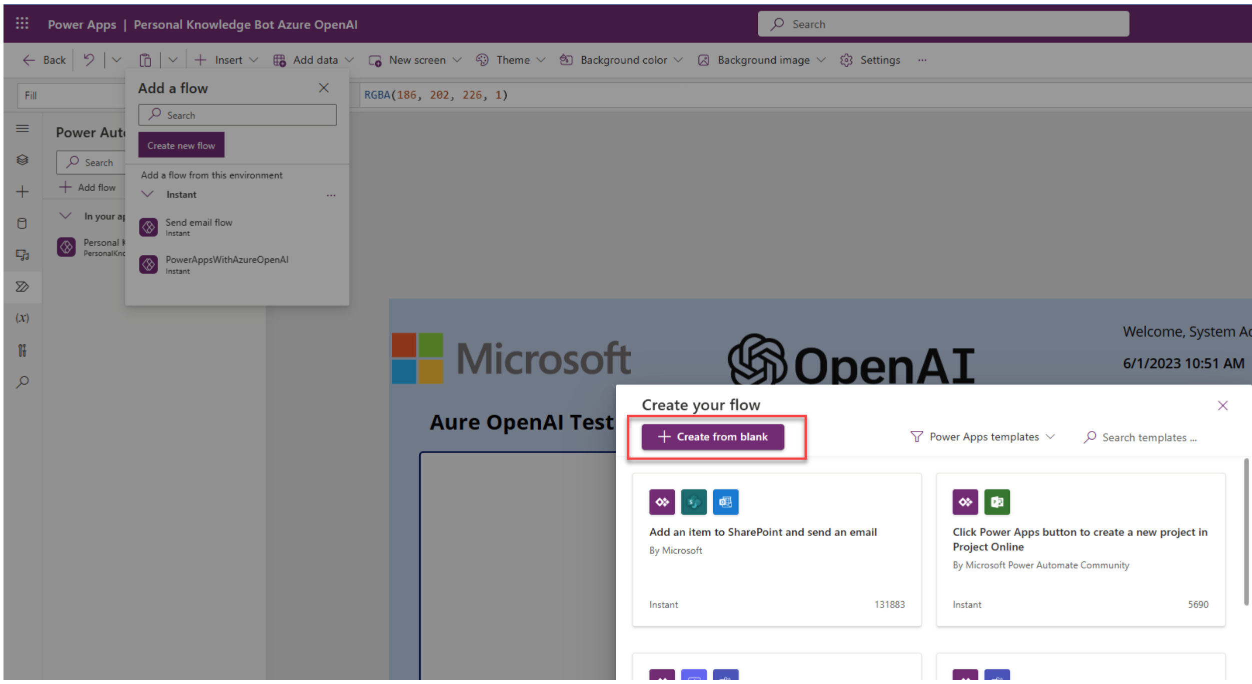
- You will build a Power Apps canvas apps
- Use **different controls** such as
    - Text labels
    - Textbox
    - Buttons



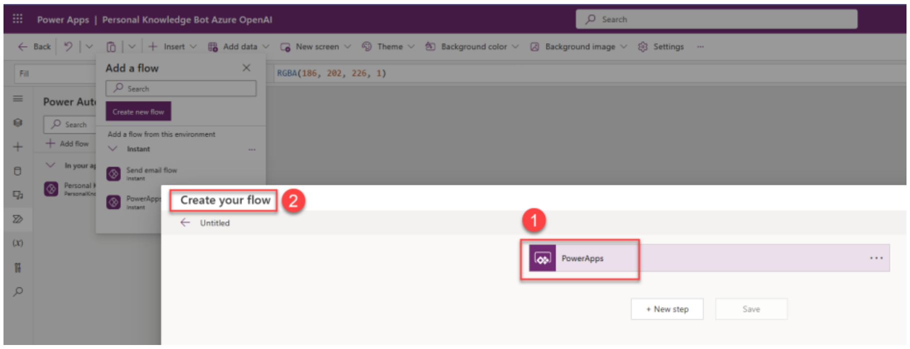
- Wire up **Power Automate flow** as follows:



- Select **Create from blank.**



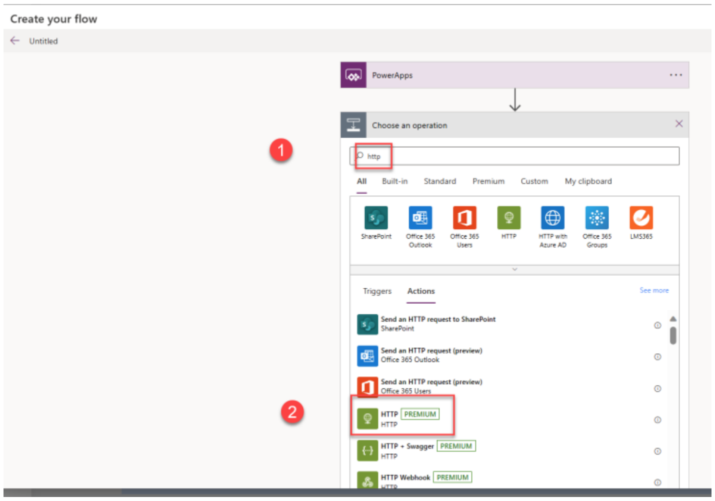
- Now our **Power Apps and Flow** are connected.



Power Automate

- In this lab, you will build a flow that uses Azure Open AI

- In **Next step**, search for **HTTP (Premium) connector**

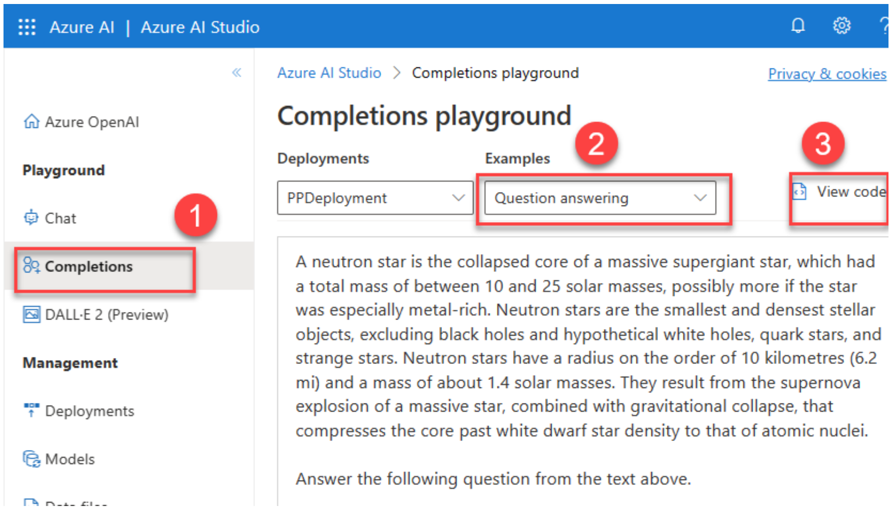


- Configure **HTTP action** as follows:
  - Method: **Post**
  - URI: **Azure OpenAI endpoint**
  - Headers: **api-key** and **key from Azure OpenAI**
  - Body: Azure OpenAI reference to **add attributes**

NOTES:

a) How to get Azure OpenAI Endpoint and api key?

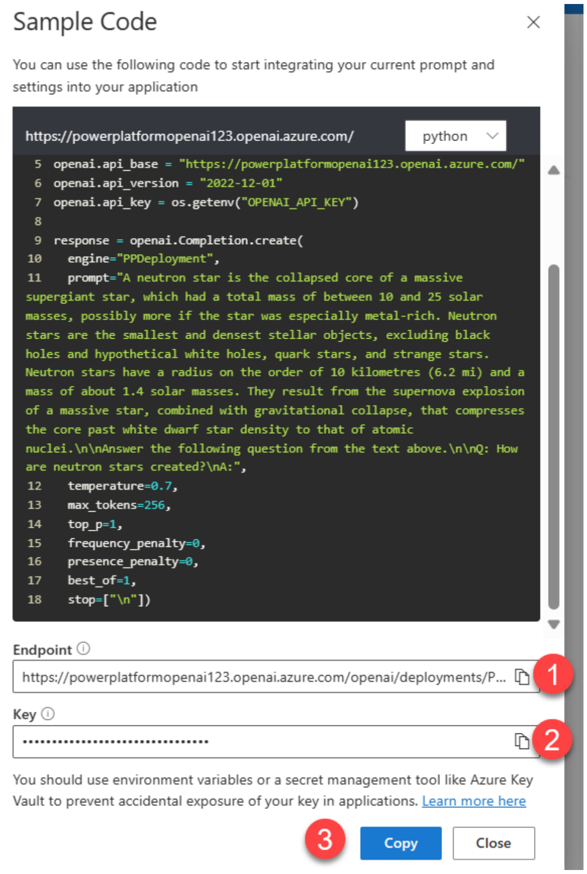
Completions >> Question answering >> View Code



A neutron star is the collapsed core of a massive supergiant star, which had a total mass of between 10 and 25 solar masses, possibly more if the star was especially metal-rich. Neutron stars are the smallest and densest stellar objects, excluding black holes and hypothetical white holes, quark stars, and strange stars. Neutron stars have a radius on the order of 10 kilometres (6.2 mi) and a mass of about 1.4 solar masses. They result from the supernova explosion of a massive star, combined with gravitational collapse, that compresses the core past white dwarf star density to that of atomic nuclei.

Answer the following question from the text above.

Copy endpoint and key at the **Copy** button



Sample Code

You can use the following code to start integrating your current prompt and settings into your application

https://powerplatformopenai123.openai.azure.com/ python

```python
openai.api_base = "https://powerplatformopenai123.openai.azure.com/"
openai.api_version = "2022-12-01"
openai.api_key = os.getenv("OPENAI_API_KEY")

response = openai.Completion.create(
  engine="PPDeployment",
  prompt="A neutron star is the collapsed core of a massive
supergiant star, which had a total mass of between 10 and 25 solar
masses, possibly more if the star was especially metal-rich. Neutron
stars are the smallest and densest stellar objects, excluding black
holes and hypothetical white holes, quark stars, and strange stars.
Neutron stars have a radius on the order of 10 kilometres (6.2 mi) and a
mass of about 1.4 solar masses. They result from the supernova explosion
of a massive star, combined with gravitational collapse, that compresses
the core past white dwarf star density to that of atomic
nuclei.\n\nAnswer the following question from the text above.\n\nQ: How
are neutron stars created?\nA:",
  temperature=0.7,
  max_tokens=256,
  top_p=1,
  frequency_penalty=0,
  presence_penalty=0,
  best_of=1,
  stop=["\n"])
```

Endpoint ⓘ

https://powerplatformopenai123.openai.azure.com/openai/deployments/P...

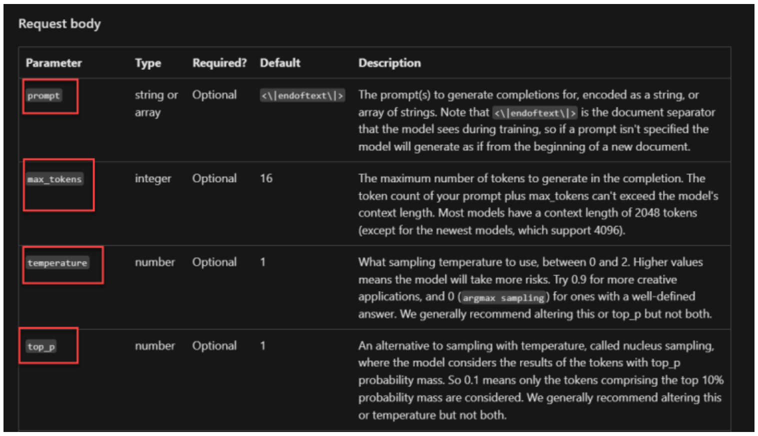
Key ⓘ

••••••••••••••••••••••••••••••••

You should use environment variables or a secret management tool like Azure Key Vault to prevent accidental exposure of your key in applications. Learn more here

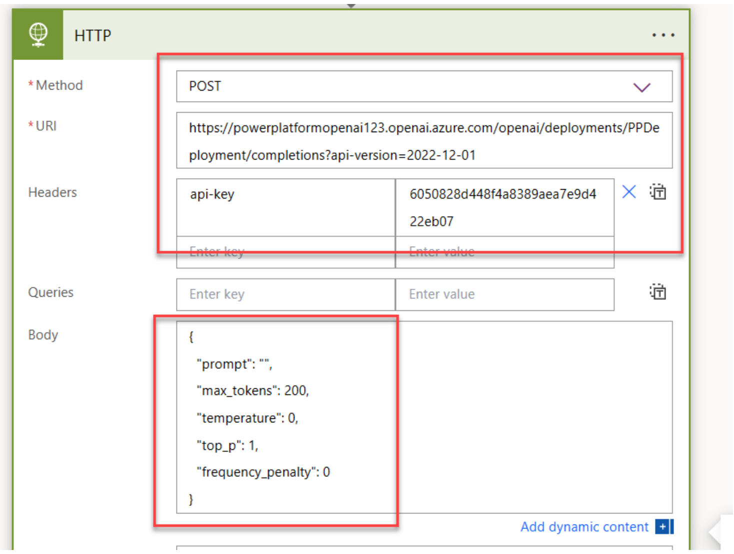
b) How to get structure for Power Automate HTTP Body attribute?

Reference: [Azure OpenAI Service REST API reference - Azure OpenAI | Microsoft Learn]



Request body

Parameter	Type	Required?	Default	Description
`prompt`	string or array	Optional	`<|endoftext|>`	The prompt(s) to generate completions for, encoded as a string, or array of strings. Note that `<|endoftext|>` is the document separator that the model sees during training, so if a prompt isn't specified the model will generate as if from the beginning of a new document.
`max_tokens`	integer	Optional	16	The maximum number of tokens to generate in the completion. The token count of your prompt plus max_tokens can't exceed the model's context length. Most models have a context length of 2048 tokens (except for the newest models, which support 4096).
`temperature`	number	Optional	1	What sampling temperature to use, between 0 and 2. Higher values means the model will take more risks. Try 0.9 for more creative applications, and 0 (`argmax sampling`) for ones with a well-defined answer. We generally recommend altering this or top_p but not both.
`top_p`	number	Optional	1	An alternative to sampling with temperature, called nucleus sampling, where the model considers the results of the tokens with top_p probability mass. So 0.1 means only the tokens comprising the top 10% probability mass are considered. We generally recommend altering this or temperature but not both.



HTTP

*Method: POST

*URI: https://powerplatformopenai123.openai.azure.com/openai/deployments/PPDeployment/completions?api-version=2022-12-01

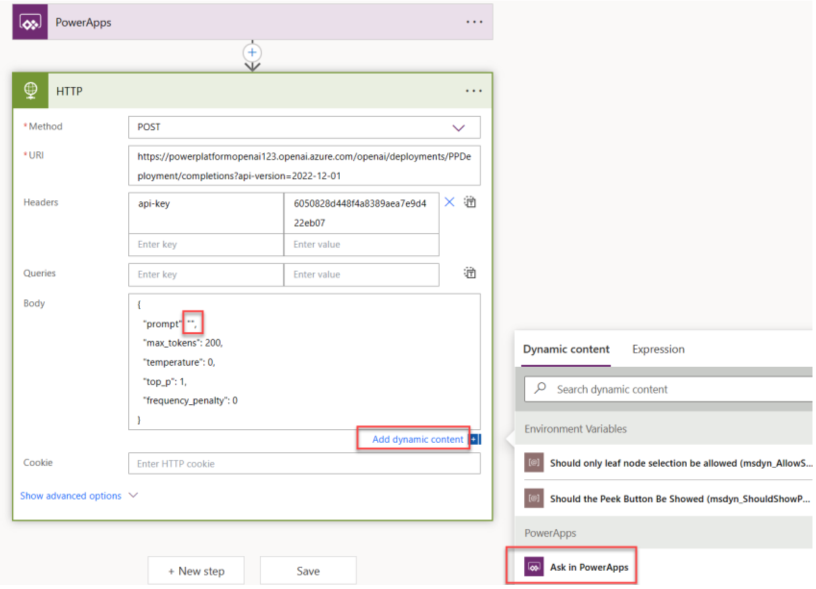
Headers	
api-key	6050828d448f4a8389aea7e9d422eb07
Enter key	Enter value

Queries	
Enter key	Enter value

Body

```
{
  "prompt": "",
  "max_tokens": 200,
  "temperature": 0,
  "top_p": 1,
  "frequency_penalty": 0
}
```

select **prompt** key within Body, select **Add dynamic content** and select Ask in **Power Apps**



PowerApps

HTTP

*Method: POST

*URI: https://powerplatformopenai123.openai.azure.com/openai/deployments/PPDeployment/completions?api-version=2022-12-01

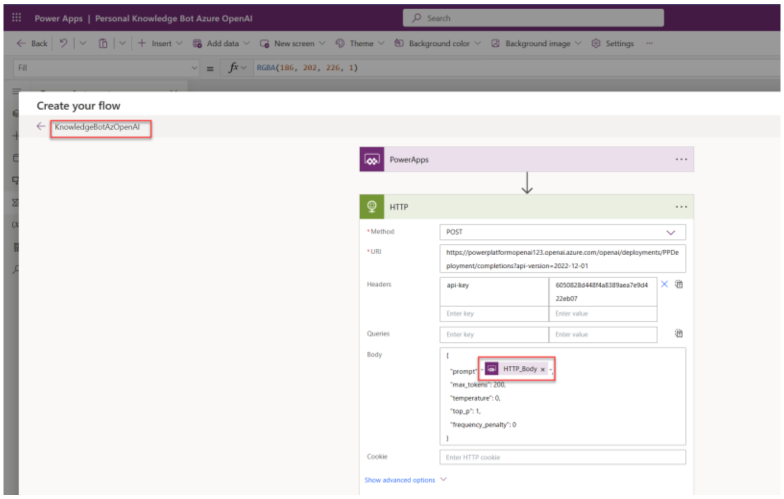
Headers	
api-key	6050828d448f4a8389aea7e9d422eb07
Enter key	Enter value

Queries	
Enter key	Enter value

Body

```
{
  "prompt": "",
  "max_tokens": 200,
  "temperature": 0,
  "top_p": 1,
  "frequency_penalty": 0
}
```

Cookie: Enter HTTP cookie

- 

RGBA(186, 202, 226, 1)

KnowledgeBotAzOpenAI

PowerApps

HTTP

* Method: POST

* URI: https://powerplatformopenai123.openai.azure.com/openai/deployments/PPDeployment/completions?api-version=2022-12-01

Headers: api-key | 6050828d448f4a8389aea7e9d422eb07

Queries: Enter key | Enter value

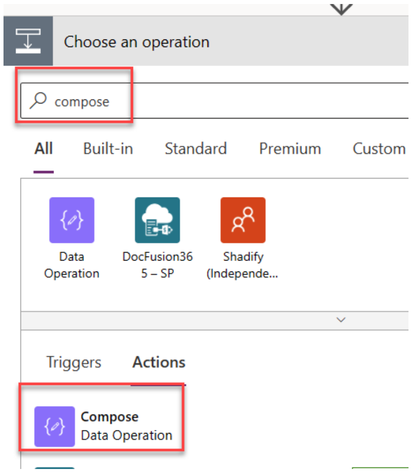
Body:

```
{
  "prompt": HTTP_Body ,
  "max_tokens": 200,
  "temperature": 0,
  "top_p": 1,
  "frequency_penalty": 0
}
```

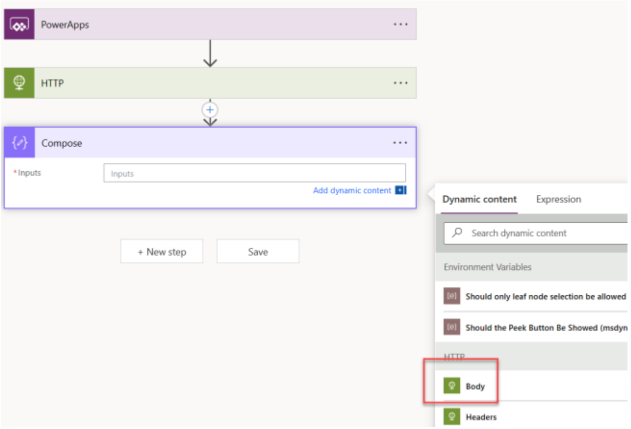
Cookie: Enter HTTP cookie

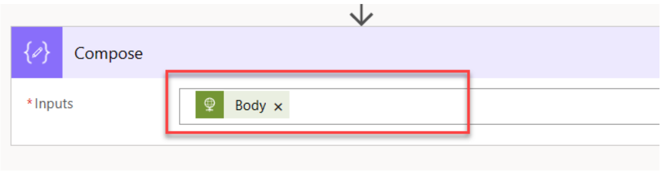
- Rename the flow **KnowledgeBotAzOpenAI**

- **Next Action** is **Compose** action

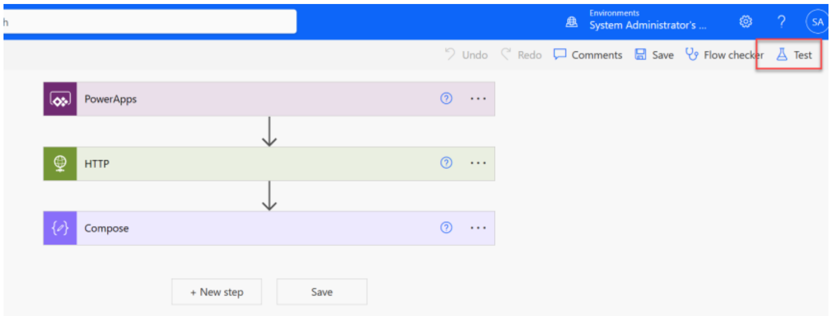


- Under Inputs, select **Body**

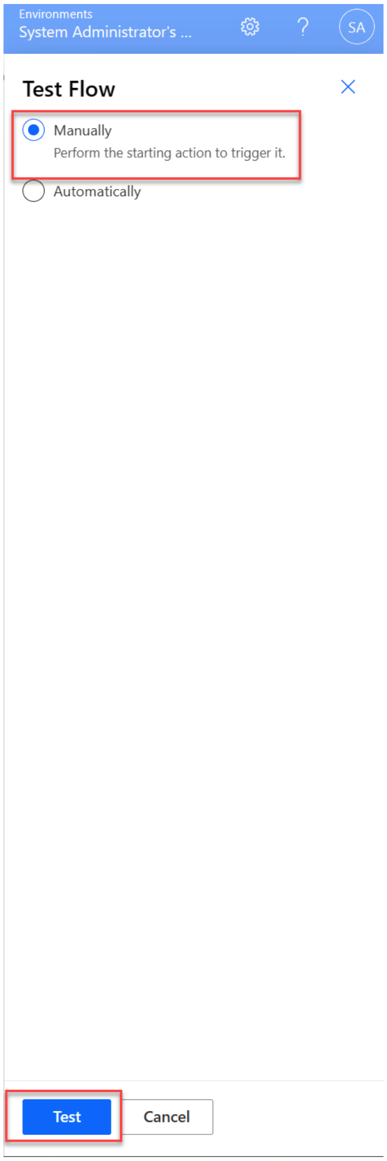




- Test the flow



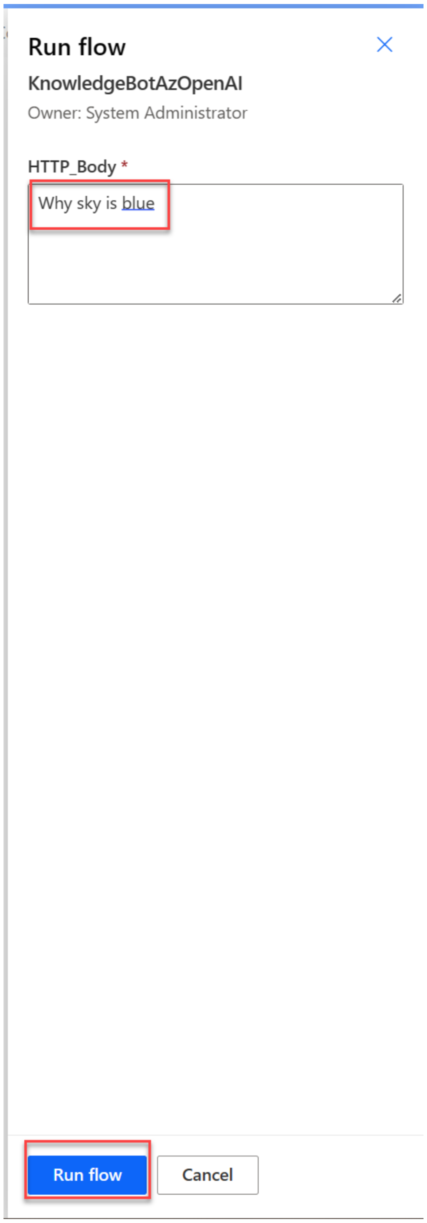
Select Manual testing



Test Flow

● Manually
Perform the starting action to trigger it.

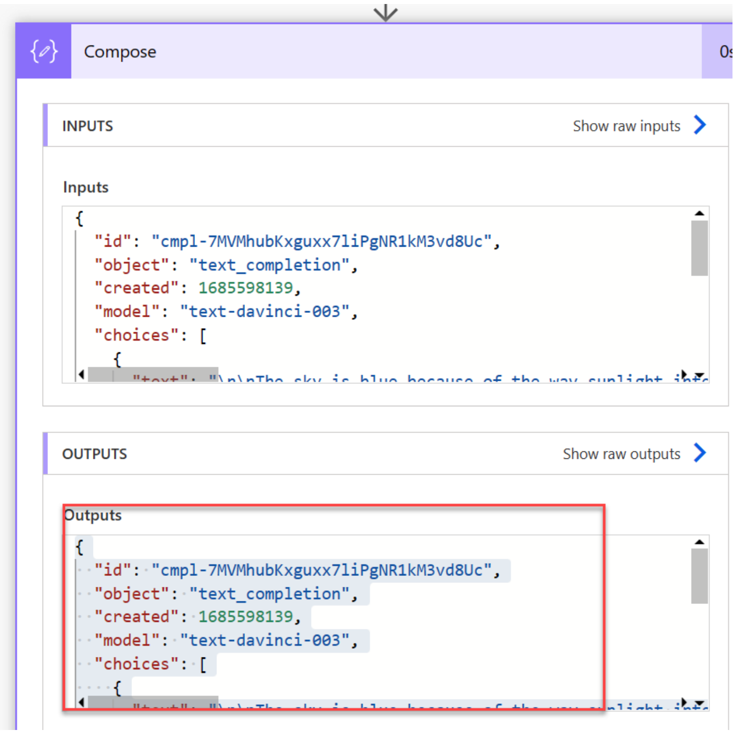
○ Automatically

- 

HTTP_Body *

Why sky is blue

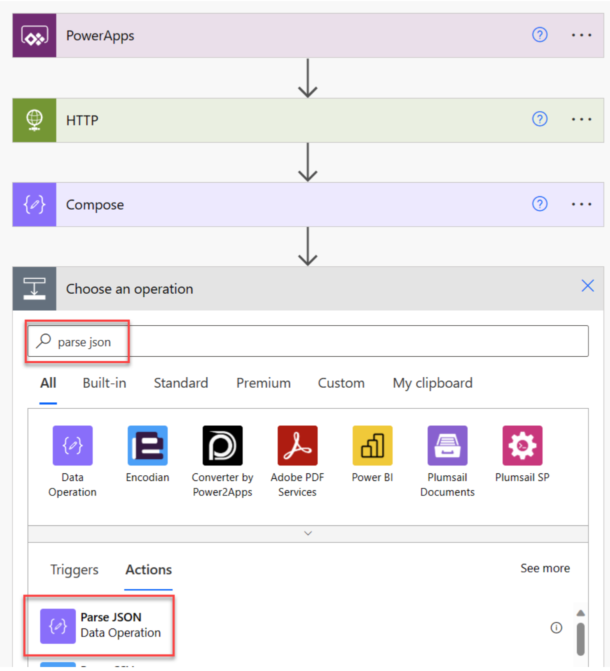
- **Copy** the Compose content (JSON) to a text file

- 

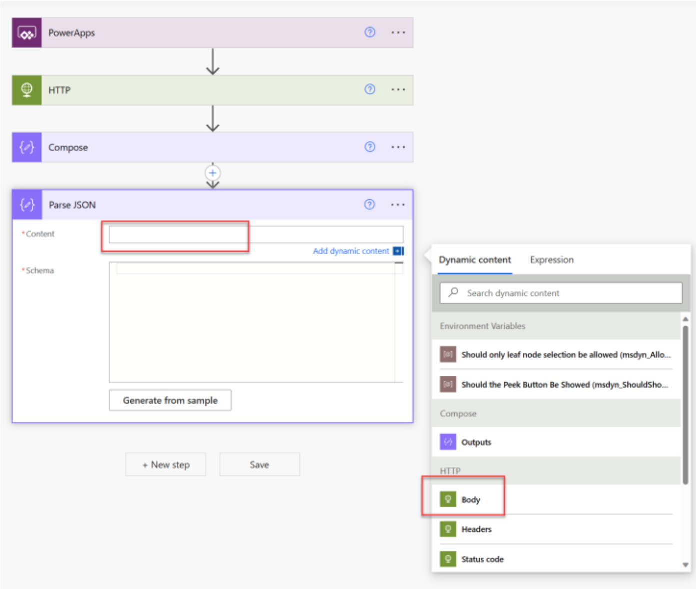
```
{
  "id": "cmpl-7MVMhubKxguxx71iPgNR1kM3vd8Uc",
  "object": "text_completion",
  "created": 1685598139,
  "model": "text-davinci-003",
  "choices": [
    {
      "text": "\n\nThe sky is blue because of the way sunlight inte
```

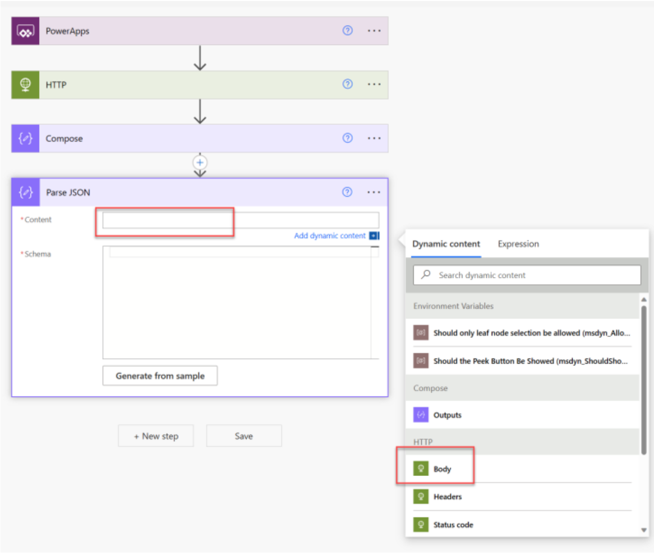
```
{
  "id": "cmpl-7MVMhubKxguxx71iPgNR1kM3vd8Uc",
  "object": "text_completion",
  "created": 1685598139,
  "model": "text-davinci-003",
  "choices": [
    {
      "text": "\n\nThe sky is blue because of the way sunlight inte
```

- Next Step, you add a **Parse JSON** action

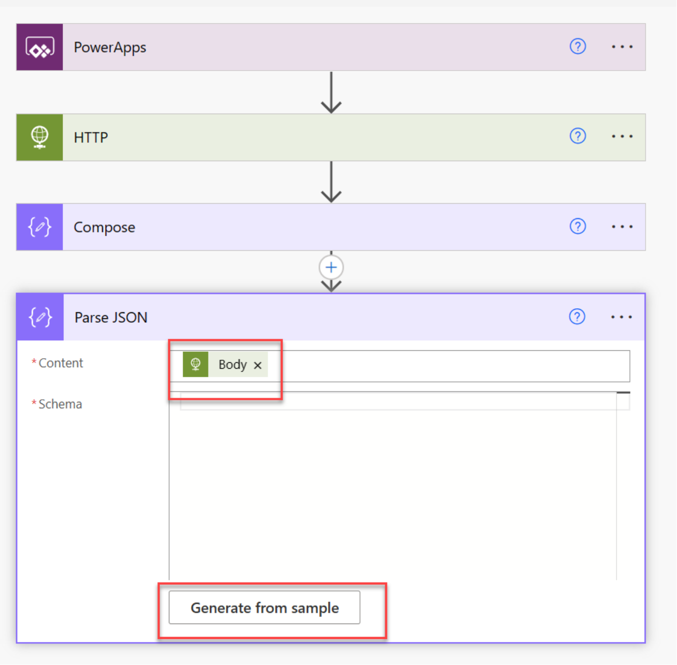


- Under **Content** select the **Body** object

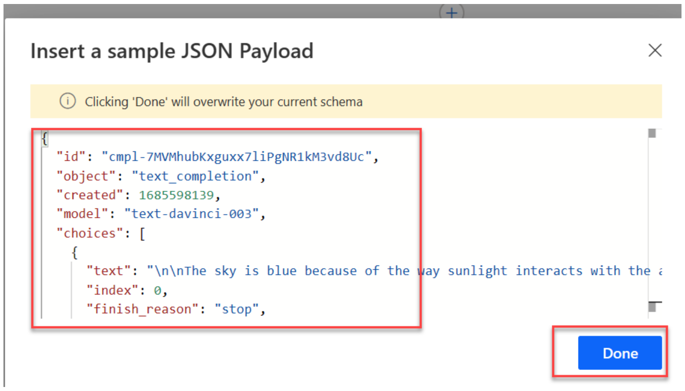




- Click on **Generate from Sample**



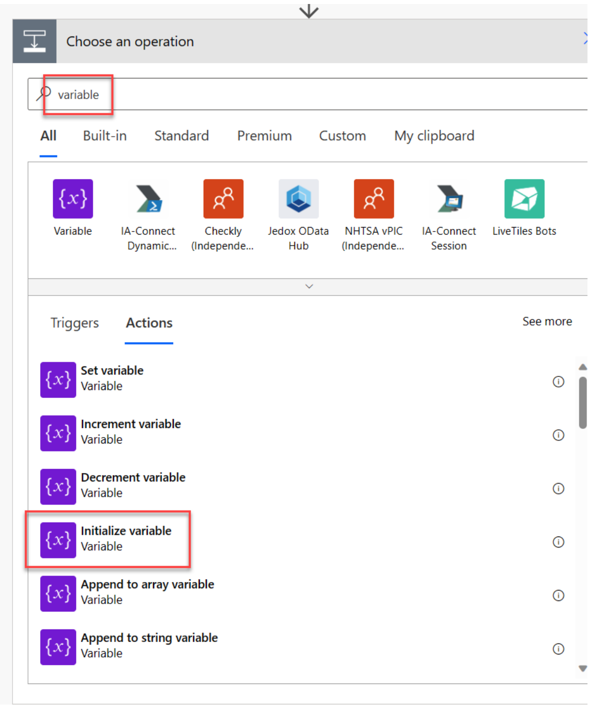
- Paste the **JSON content** that copied from above steps.



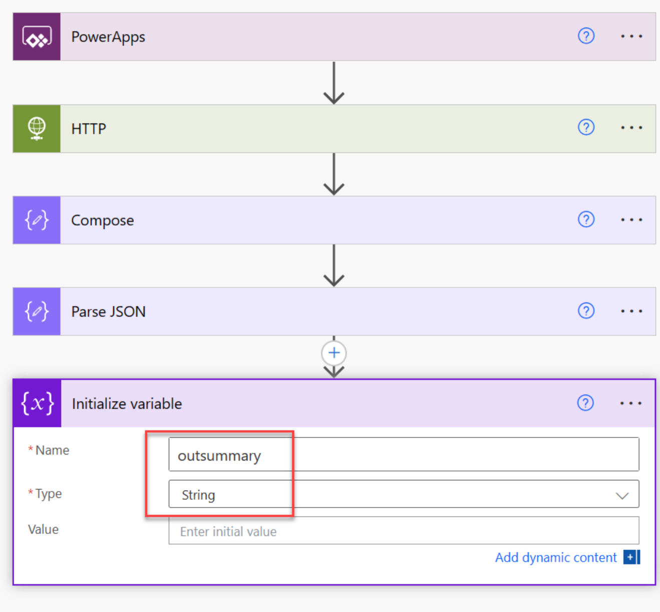
Clicking 'Done' will overwrite your current schema

```
{
  "id": "cmpl-7MVMhubKxguxx7liPgNR1kM3vd8Uc",
  "object": "text_completion",
  "created": 1685598139,
  "model": "text-davinci-003",
  "choices": [
    {
      "text": "\n\nThe sky is blue because of the way sunlight interacts with the a
      "index": 0,
      "finish_reason": "stop",
```

- Create a new variable



variable

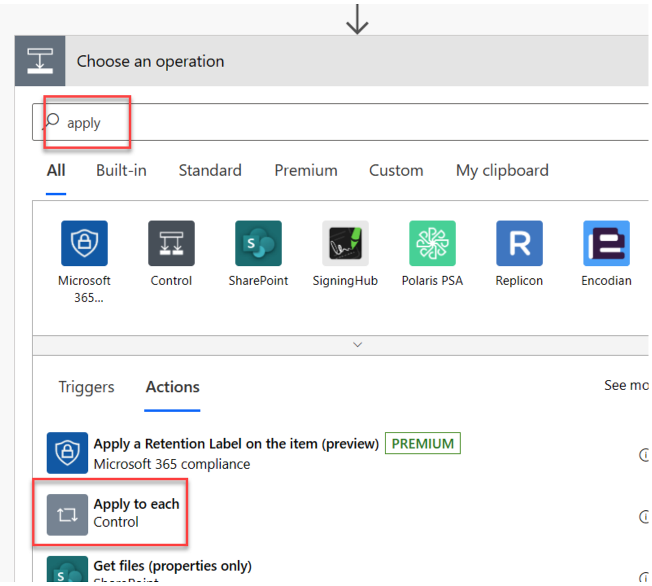


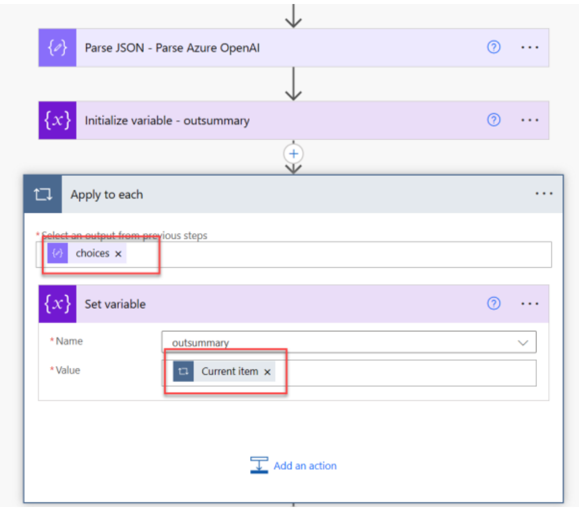
*Name: outsummary

*Type: String

Value: Enter initial value

- Next Action, you get **Apply for each loop**, extract **choices** and set a outsummary variable



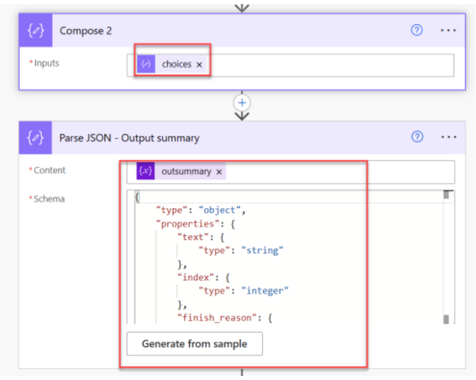

Parse JSON - Parse Azure OpenAI
Initialize variable - outsummary
Apply to each
Set variable
Add an action

* Select an output from previous steps: choices

* Name: outsummary

* Value: Current item

- Follow the same step that you did **Compose** message and extract the JSON content.



Compose 2

*Inputs: choices ×

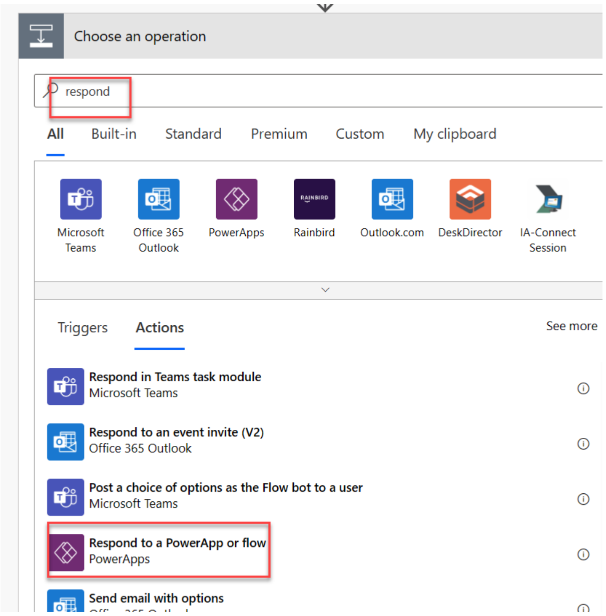
Parse JSON - Output summary

*Content: outsummary ×

*Schema

```
{
    "type": "object",
    "properties": {
        "text": {
            "type": "string"
        },
        "index": {
            "type": "integer"
        },
        "finish_reason": {
```

- ○ Next Action will be **Respond to a Power App or Flow**



Choose an operation

respond

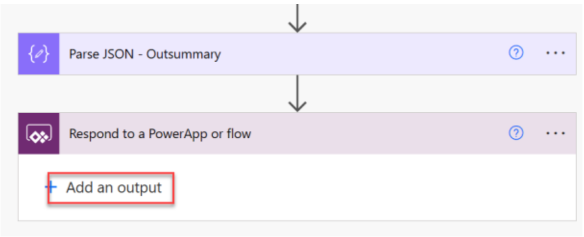
Respond in Teams task module
Microsoft Teams

Respond to an event invite (V2)
Office 365 Outlook

Post a choice of options as the Flow bot to a user
Microsoft Teams

Respond to a PowerApp or flow
PowerApps

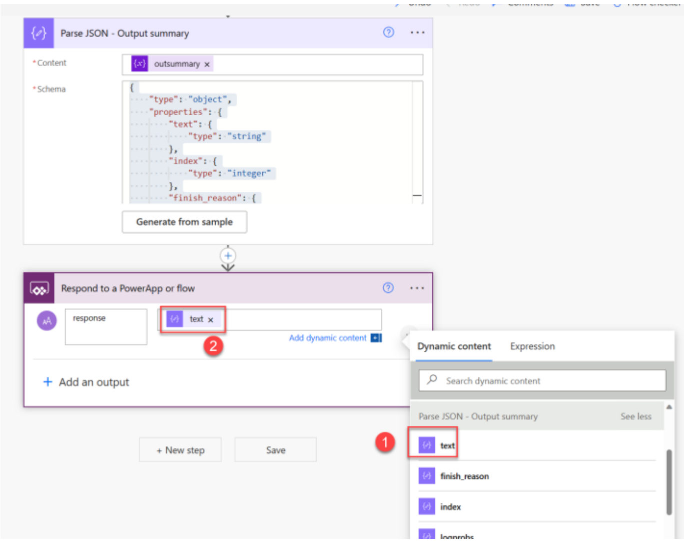
Send email with options



Parse JSON - Outsummary

Respond to a PowerApp or flow

- ○

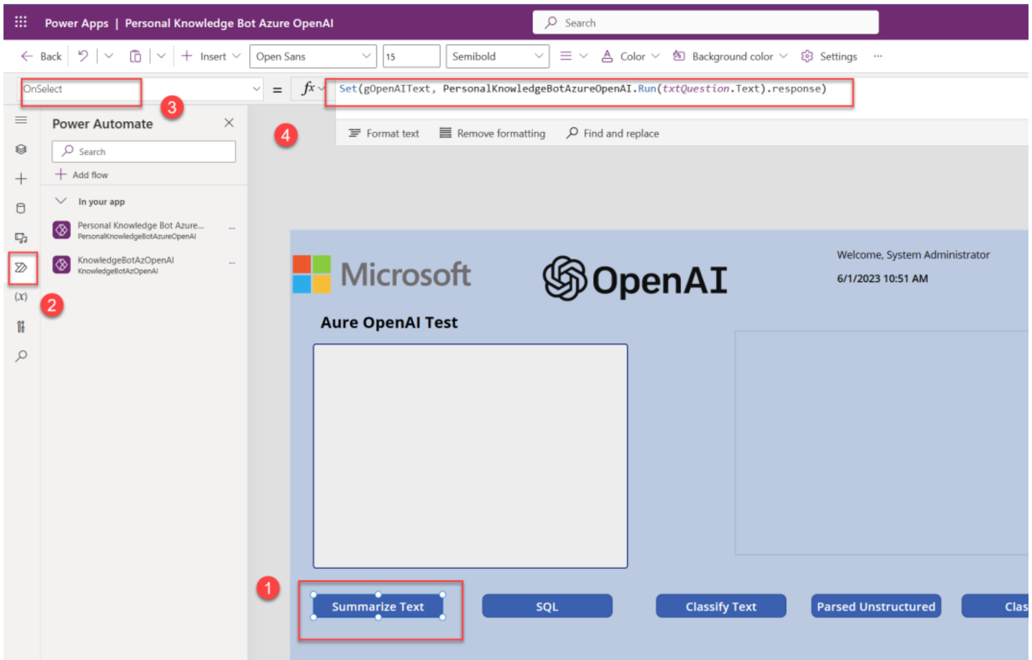
- 

```
{
    "type": "object",
    "properties": {
        "text": {
            "type": "string"
        },
        "index": {
            "type": "integer"
        },
        "finish_reason": {
```

- Save the Flow

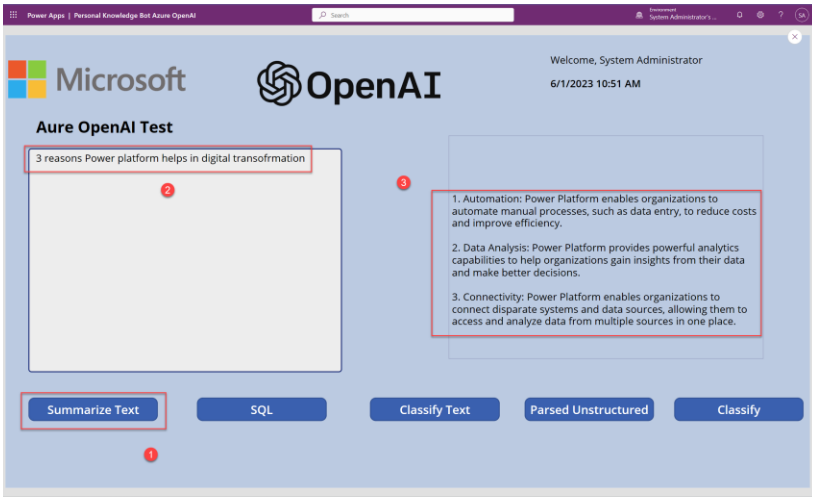
User Experience

- Attached Flow to Power Apps on the **Summarize Text**



```
Set(gOpenAIText, PersonalKnowledgeBotAzureOpenAI.Run(txtQuestion.Text).response)
```

- Run the app

- 

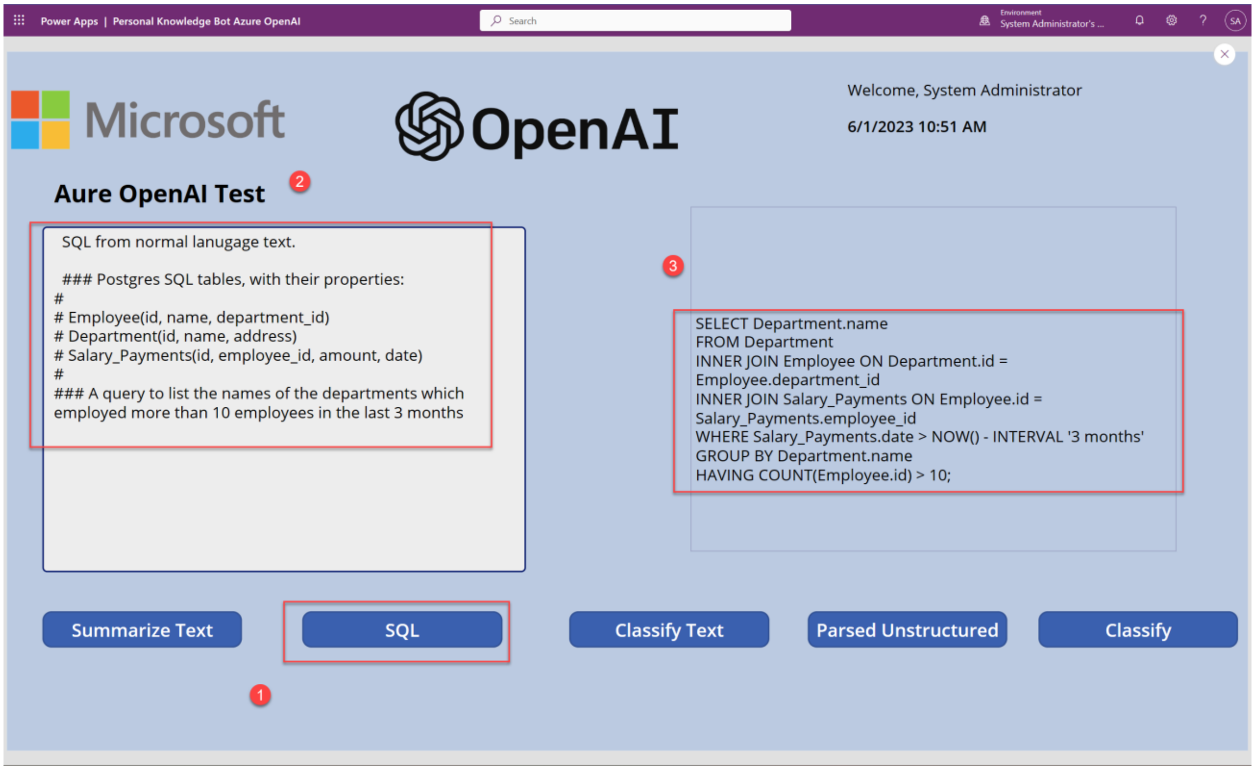
3 reasons Power platform helps in digital transofrmation

1. Automation: Power Platform enables organizations to automate manual processes, such as data entry, to reduce costs and improve efficiency.

2. Data Analysis: Power Platform provides powerful analytics capabilities to help organizations gain insights from their data and make better decisions.

3. Connectivity: Power Platform enables organizations to connect disparate systems and data sources, allowing them to access and analyze data from multiple sources in one place.

- SQL



```
 SQL from normal lanugage text.

 ### Postgres SQL tables, with their properties:
#
# Employee(id, name, department_id)
# Department(id, name, address)
# Salary_Payments(id, employee_id, amount, date)
#
### A query to list the names of the departments which
employed more than 10 employees in the last 3 months
```

```
SELECT Department.name
FROM Department
INNER JOIN Employee ON Department.id =
Employee.department_id
INNER JOIN Salary_Payments ON Employee.id =
Salary_Payments.employee_id
WHERE Salary_Payments.date > NOW() - INTERVAL '3 months'
GROUP BY Department.name
HAVING COUNT(Employee.id) > 10;
```

References

1, **Azure OpenAI official documentation:** This is the official documentation provided by Microsoft Azure, offering detailed information, guides, tutorials, and examples on using Azure OpenAI.

- Documentation link: [Azure OpenAI Documentation](https://docs.microsoft.com/en-us/azure/openai/)

2. **Azure OpenAI Blog:** Stay updated with the latest news, announcements, case studies, and best practices related to Azure OpenAI through the official Azure Blog.

   - Blog link: [Azure Blog - OpenAI](https://azure.microsoft.com/en-us/blog/topics/ai-openai/)

3. **Azure AI Developer Center:** This resource provides a comprehensive collection of documentation, samples, SDKs, and tools for AI development on Azure, including OpenAI.

   - Developer Center link: [Azure AI Developer Center](https://azure.microsoft.com/en-us/developers/ai/)

4**. Microsoft Learn:** Microsoft Learn offers free, interactive, and hands-on learning modules and courses to help you understand and implement Azure OpenAI effectively.

   - Microsoft Learn link: [Azure OpenAI on Microsoft Learn](https://docs.microsoft.com/en-us/learn/azure/openai/)

5. **Azure AI Gallery:** Explore a wide range of AI solutions and examples created by the community and Microsoft experts on the Azure AI Gallery. You can find sample projects and resources related to Azure OpenAI.

   - Azure AI Gallery link: [Azure AI Gallery](https://gallery.azure.ai/)

These references should provide you with a solid foundation and valuable resources to explore Azure OpenAI and its integration with various Azure services.