

# **GenAI Tool: Data Generator**

Connected System Plugin for **Appian**

# Appian Corporation

Version 1.0.0

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## Overview

The GenAI Tool: Data Generator Connected System allows developers to generate sample data of an inputted Record Type with generative AI. This tool generates data that adheres to the structures of 1:1, 1:N, and N:1 relationships by generating the relational data alongside the primary data. This data is primarily for the use of demonstrating the functionality of an application with life-like data that fits into a custom database design.

Developers can generate sample records through Appian with this connected system by entering the credentials retrieved from either OpenAI or Azure OpenAI Studio. This documentation outlines the process of obtaining and leveraging these credentials within the Appian platform. The documentation also gives a step by step tutorial on how to set up the Sample App which can be downloaded from the Appian AppMarket with the connected system for this tool.

## Privacy Policy


All information passed through AI tools will be processed and may remain with the organizations that develop those tools. Please exercise caution with what information is disclosed to the AI tool for this reason.

## Features

- Generate sample data for each field of a specified Record Type
- Builds data for 1:1, 1:N, and N:1 Record Type relationships

## Chat Completion Model: OpenAI

### Connected System Properties



#### GenAI Tool: Data Generator

Generate sample Record data with ChatGPT. The RecordType should have at least one row for the plugin to generate data.  
Version: 1

**Name \***

**Description**

#### GenAI Tool: Data Generator Configuration

**Authentication**

Use the OpenAI services for Chat Completion

**OpenAI API Key \***

Enter your OpenAI APIKey. Visit <https://beta.openai.com/account/api-keys> to get an API key for your account.

**Completion Model \***

Provide the name of the model to use for text completion. Example: gpt-3.5-turbo for GPT 3.5 Turbo model, gpt-4 for GPT 4 model. gpt-4 is the most consistent model in determining the size of output while gpt-3.5-turbo is faster than gpt-4. Visit <https://platform.openai.com/docs/models/model-endpoint-compatibility> and use one of the models listed under /v1/chat/completions endpoint.

Connection successful

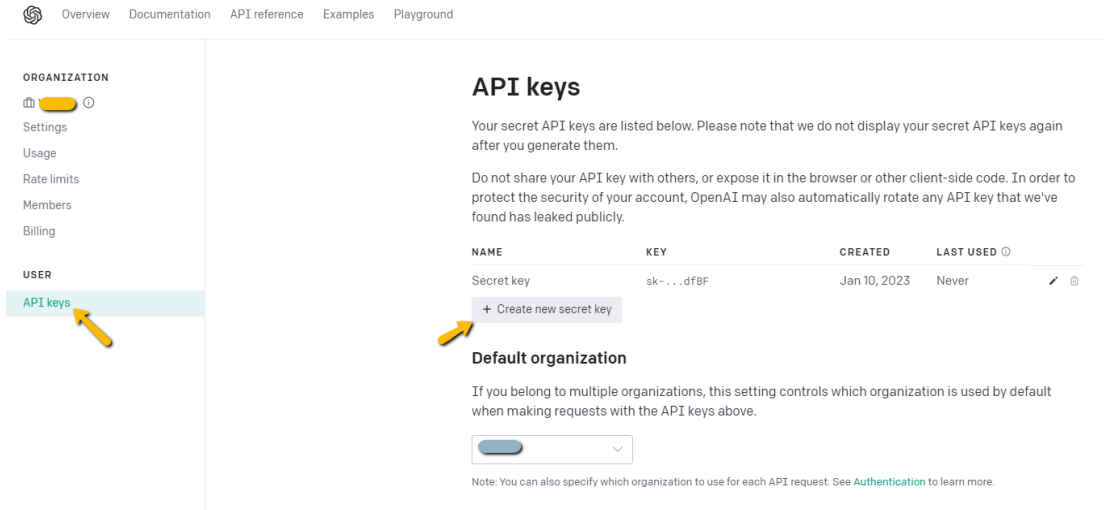
**TEST CONNECTION**

**CANCEL** **USE IN NEW INTEGRATION** **SAVE**

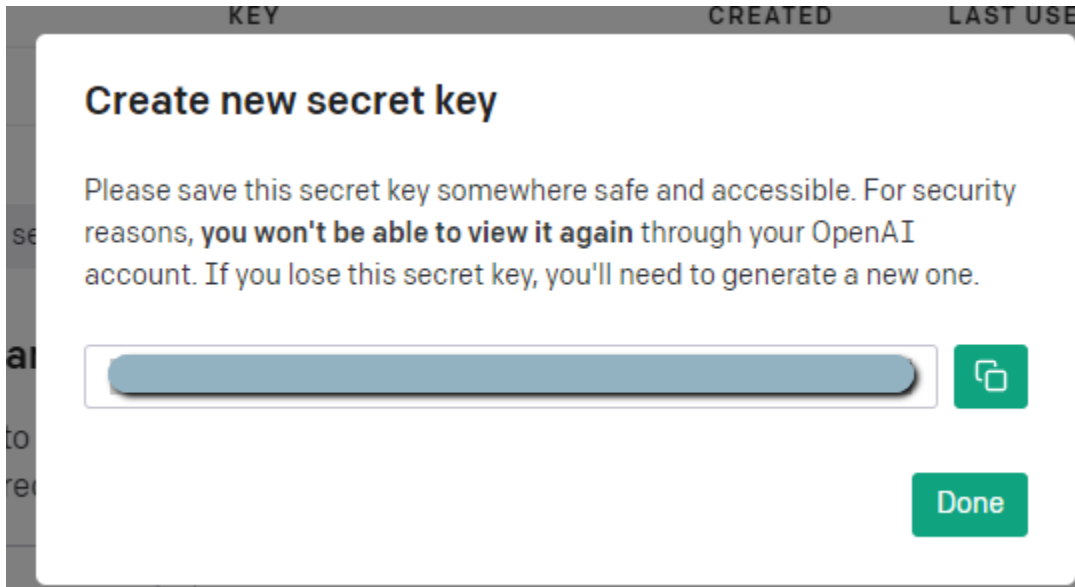
The Document Summarization Connected system with OpenAI authentication requires the following credentials: **OpenAI API Key** and **Chat Completion model**.

To retrieve your OpenAI API Key:

1. Go to the [OpenAI console](#). Make sure that the **API keys** menu is selected.



2. Click on **Create new secret key** to generate a new API key.
3. Copy the value and save it separately as we won't be able to access it again. Paste the API key in the connected system dialog box.



To find the appropriate Chat Completions model:


1. Visit <https://platform.openai.com/docs/models/model-endpoint-compatibility> and use one of the models listed under `/v1/chat/completions` endpoint. Example: `gpt-3.5-turbo`

for GPT 3.5 Turbo model, gpt-4 for GPT 4 model.

- a. Each model has unique strengths so try to select the most appropriate for your use. If you would like to prioritize consistency in the size and format of your generated summary, we recommend you use a GPT 4 model. If you need to prioritize speed of generation, GPT 3.5 Turbo might be better suited.

## Chat Completion Model: Azure OpenAI

### Connected System Properties

**GenAI Tool: Data Generator**

Generate sample Record data with ChatGPT. The RecordType should have at least one row for the plugin to generate data.  
Version: 1

**Name \***

**Description**

**GenAI Tool: Data Generator Configuration**

**Authentication**

Use the Azure Open AI services for Chat Completion

**Azure Region \***

Provide the Azure region.

**Deployment ID \***

Provide the Deployment ID.

**Azure API Key \***

Provide the API Key obtained from Azure OpenAI

Connection successful

**TEST CONNECTION**

**CANCEL** **USE IN NEW INTEGRATION** **SAVE**

This authentication requires the following credentials: Azure Region, Azure Deployment ID and Azure API Key. Follow these steps to get the Azure credentials.

## Set up your Azure OpenAI Account

1. Navigate to [Azure's OpenAI API docs](#) and ensure you have met the listed prerequisites. View the prerequisites by selecting "Quickstarts." If you have not already done so, [create an Azure subscription](#).

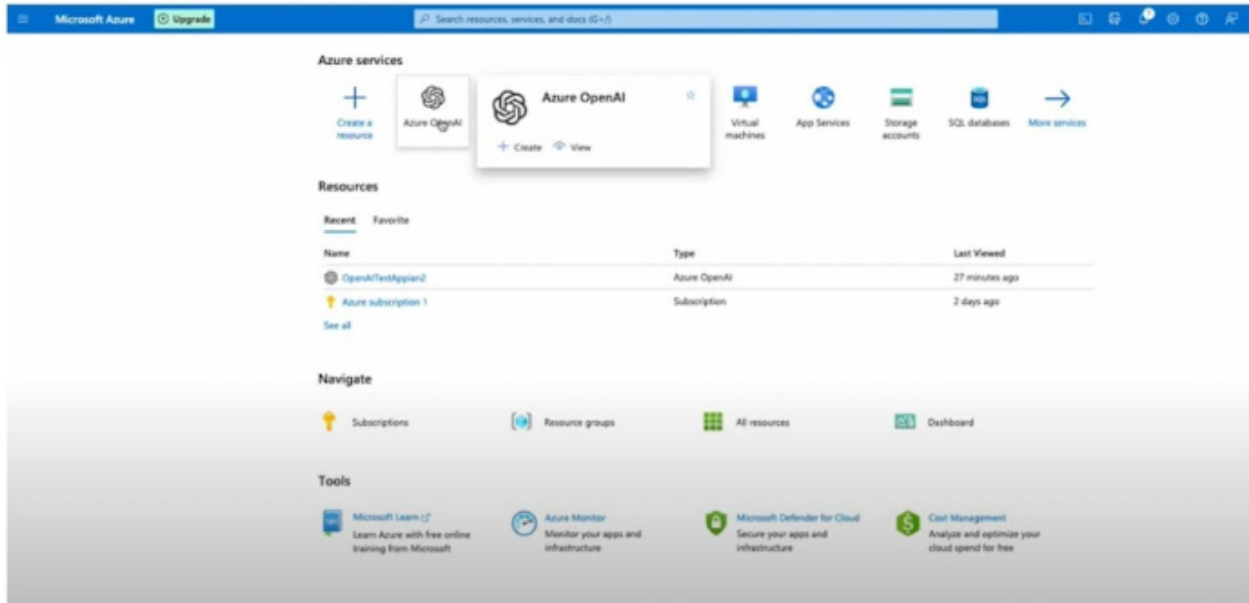
The screenshot shows the Azure OpenAI Service Documentation page. At the top, there is a navigation bar with the Microsoft logo, 'Learn', and various links like 'Documentation', 'Training', 'Certifications', 'Q&A', 'Code Samples', 'Assessments', 'Shows', and 'Events'. A search bar and 'Sign in' link are also present. Below the navigation bar, the main heading is 'Azure OpenAI Service Documentation'. Underneath, there is a brief description: 'Learn how to use Azure OpenAI's powerful language models including the GPT-3, Codex and Embeddings model series for content generation, summarization, semantic search, and natural language to code translation.' The page features a grid of eight tiles: 'OVERVIEW: What is Azure OpenAI Service?', 'QUICKSTART: Quickstarts', 'HOW-TO GUIDE: Create a resource', 'TUTORIAL: Embeddings', 'HOW-TO GUIDE: Completions', 'TRAINING: Intro to Azure OpenAI training', 'CONCEPT: Azure OpenAI Models', and 'REFERENCE: Support and help options'. Below this grid, there is a section titled 'Additional resources' with four sub-sections: 'Azure OpenAI' (including links for Studio, support, quotas, and access), 'Video' (Combining OpenAI models with the power of Azure), 'Reference' (REST API, Terms of use), and 'Tools' (Azure CLI, PowerShell).

2. Apply for access to Azure OpenAI services by completing the form [here](#). You will need your subscription ID from the previous step.

The screenshot shows the 'Request Access to Azure OpenAI Service' form. The title is 'Request Access to Azure OpenAI Service'. Below the title, there is a section marked with an asterisk and the word 'Required'. The text reads: 'Please read all instructions carefully and complete form as instructed'. This is followed by a paragraph of introductory text: 'Thank you for your interest in Azure OpenAI Service. Please submit this form to register for approval to access and use Azure OpenAI's Limited Access text and code and/or DALL-E 2 text to image models (as indicated in the form). All use cases must be registered. Azure OpenAI Service requires registration and is currently only available to approved enterprise customers and partners. Learn more about limited access to Azure OpenAI Service here.' Below this is a section titled 'Limited access scenarios:' which explains that when evaluating scenarios for onboarding, the team considers who will directly interact with the application, the domain, and the extent of capabilities. It notes that high-stakes domains (e.g., medical) require additional mitigations and are more likely to be approved for internal-only users and audiences. Applications with broad possible uses, including content generation capabilities, are more likely to be approved if 1) the domain is not high stakes and users are authenticated or 2) in the case of high stakes domains, anyone who views or interacts with the content is internal to your company. The final line of text states: 'Please be sure to visit the Azure OpenAI Service's transparency note, which provides information and guidelines for responsible use of the service as well as system limitations that may be applicable to your scenario.'

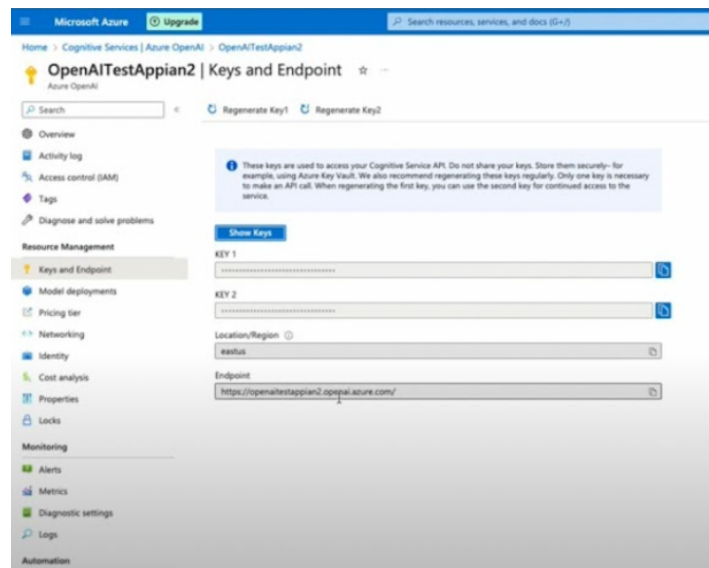
3. Create a service and set your domain name.





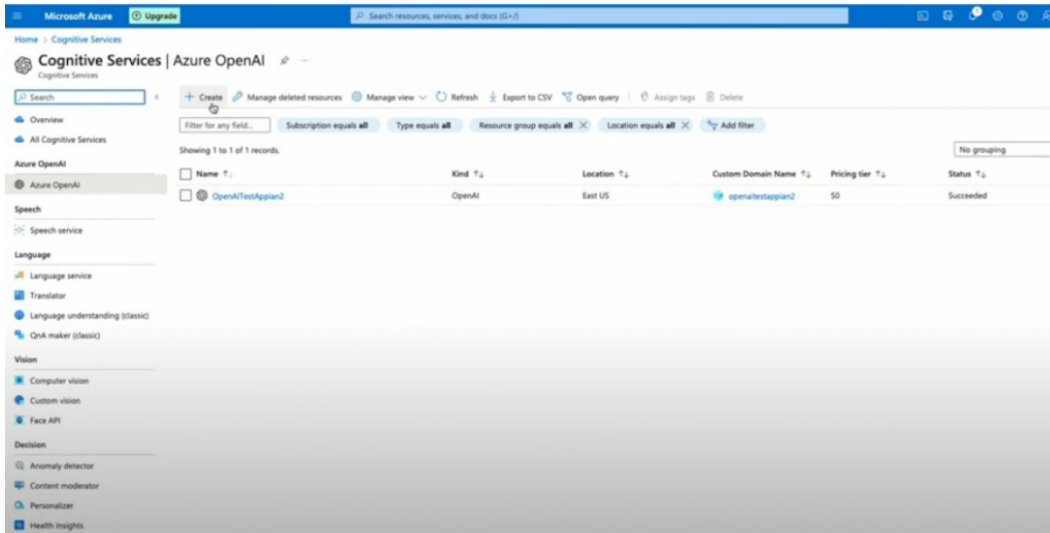
## Create and Access API Keys

4. Within your service, create and access API keys through “Keys and Endpoints” under Resource Management. The “Location/Region” listed in this window will be used as your **Azure Region** in the Connected System configuration.

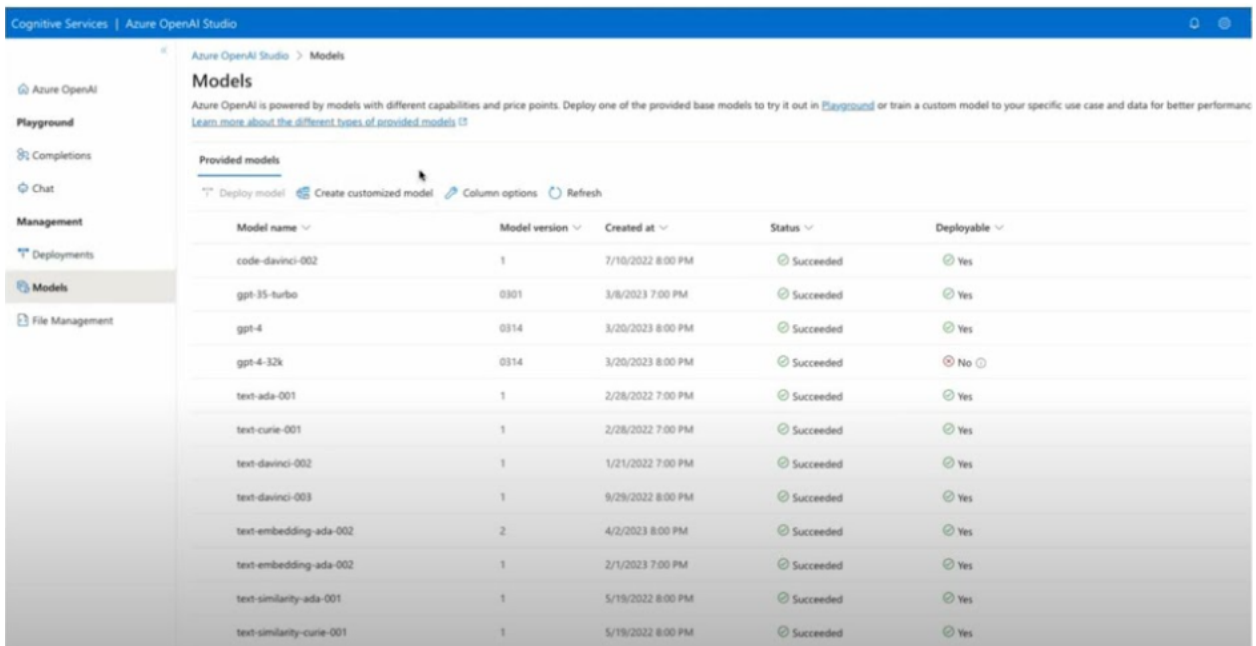


## Deploy OpenAI Models and Set your Deployment ID

5. Visit the Azure OpenAI Studio to deploy OpenAI models under your created resource.



6. Click into your resource to enter the Azure OpenAI Studio. Navigate to “Models” seen as a tab on the left side of the screen. After selecting the best OpenAI Model for your data and use case, deploy your selected chat completions model. The **deployment ID** you create during deployment will be used when configuring your Connected System.



## Integration

Generate sample records for a Record Type.

ChatGPT Prompt used:

"Create example data for a <relationship> based on the given input. The input consists of an array of JSON objects, each comprising "lastRowData" (representing the last row of a table) and "numberOfRows" (indicating the desired number of generated rows). The resulting JSON array should consist of objects with field names as keys, each containing arrays of sample data. The first object serves as the base table, and subsequent tables are linked through an <relationship>. In cases where tables share field names, ensure they are correlated. To ensure correlation between primary keys in the base and related tables, start data generation for each related table from the next available value after the corresponding primary key in the base table. If tables share field names, ensure that they are correlated. Output the JSON array without introducing newlines within the fields. The generated data should be different from the lastRowData. The fields other than primary key and foreign keys for all the tables should be AI generated. This adjustment aims to guarantee a coherent relationship between primary keys in both the base and related tables. Provide the JSON array without introducing newlines for the following input. The datatype of the fields are: <Fields Info>"

**Note:** The record type to generate data for needs to have at least one instance of data before using this tool. This is because the Data Generator tool relies on the last row of data in the specified record type's data as a model for the generated data and to ensure the primary key is incremented from the correct value. Additionally, we do not advise generating large amounts of data (more than 45 rows) in a single integration call. To generate more data, we recommend that you make multiple separate calls to the Data Generator tool.

1. One to One Relationship

### Inputs:

**Primary Record Last Row** (Text) - Required - JSON string from the last row of the primary record type to generate. Use the recordqueryhelper function to retrieve this data. The input of recordqueryhelper should be the Record Type to generate, wrapped in a toxml() function. An example of this format: recordqueryhelper( toxml( recordType!{recordName} ) )

**Related Records Last Row** (List of Text) – Optional - Details of the records related to the primary record. If the primary record generated references another record by a foreign key in a 1 to many relationship, add the related record in a list here. This record input will follow the same format as above where each record must be wrapped in a recordqueryhelper() and a toxml() function. More instructions on this format:

Provide the JSON strings returned from the recordqueryhelper function in List of Text format.  
 Example: { recordqueryhelper(toxml(recordType!{recordType1})),  
 recordqueryhelper(toxml(recordType!{recordType2})) }

**Number of Rows of Primary Record** (Integer) – Optional - Provide the number of Primary Record Rows to be generated. Default: 1

**Custom Instructions**(List of Text) – Optional - Provide any additional instructions for the data generation in a list of text. These instructions can be written in natural language. Example: { "all emails should be gmail accounts", "generate any dates in dd-mm-yy format"}

The screenshot shows the configuration and execution of a data generation rule. On the left, the 'Rule Input Name' table is visible:

Rule Input Name	Expression	Value
primaryRecordLastRow (Text)	1 recordqueryhelper( 2 toxml(recordType!DGS_Student) 3 )	"{"name":"DGS Student","lastRow": {\"primaryKeyName\":\"studentId\",\"fi elds\": [\"studentId\",\"studentName\",\"birth Date\",\"gradeLev...More
relatedRecordsLastRow (List of Text String)	1 { 2 recordqueryhelper( 3 toxml(recordType!DGS_Student_Contact) 4 )	List of Text String: 1 Item {"name":"DGS Student Contact","lastRow": {\"primaryKeyName\":\"contactId\",\"fi elds\":[\"contact...More
numberOfPrimaryRecordRows (Number (Integer))	1 1	1
customInstruction (Text)	1 null	null (Text)

The 'Related Records Last Row' field contains the expression: `r1relatedRecordsLastRow`.

The execution results show a 'Success!' message and a detailed JSON response structure:

```

Value: Result
- Dictionary
  - relatedRecordsData List of Dictionary - 1 Item
    - Dictionary
      - data List of Dictionary - 1 Item
        - Dictionary
          - studentId 15 (Number (Decimal))
          - contactId 6 (Number (Decimal))
          - contactEmail "johnsmith@mail.com" (Text)
          - contactPhone "7890123456" (Text)
          - name "DGS Student Contact" (Text)
          - success true (Boolean)
        - primaryRecordData Dictionary
          - data List of Dictionary - 1 Item
            - Dictionary
              - studentId 15 (Number (Decimal))
  
```

**Output:** Dictionary

```

{relatedRecordsData: {{data: {{studentId: 15, contactId: 6, contactEmail:
"emilyjohnson@mail.com", contactPhone: "7890123456"}}}, name: "DGS Student Contact"}},
success: true, primaryRecordData: {data: {{studentId: 15, gradeLevel: 9, studentName: "Emily
Johnson", birthDate: "2006-05-12"}}}, name: "DGS Student"}}
  
```

## 2. One to Many Relationship

### Inputs:

**Primary Record Last Row** (Text) - Required - JSON string from the last row of the primary record type to generate. Use the recordqueryhelper function to retrieve this data. The input of recordqueryhelper should be the Record Type to generate, wrapped in a toxml() function. An example of this format: recordqueryhelper( toxml( recordType!{recordName} ) )

**Related Records Last Row** (List of Text) – Optional - Details of the records related to the primary record. If the primary record generated references another record by a foreign key in a 1 to many relationship, add the related record in a list here. This record input will follow the same format as above where each record must be wrapped in a recordqueryhelper() and a toxml() function. More instructions on this format:

Provide the JSON strings returned from the recordqueryhelper function in List of Text format. Example: { recordqueryhelper(toxml(recordType!{recordType1})), recordqueryhelper(toxml(recordType!{recordType2})) }

**Number of Rows of Primary Record** (Integer) – Optional - Provide the number of Primary Record Rows to be generated. Default: 1

**Rows per Primary Record** (Integer) – Optional - Provide the number of related records to generate for each primary record generated. For example, assume your primary record is a Student record type and your related record type is Parent. If you want each student record to reference two parent records, input 2 here. Default: 1

**Custom Instructions**(List of Text) – Optional - Provide any additional instructions for the data generation in a list of text. These instructions can be written in natural language. Example: { "all emails should be gmail accounts", "generate any dates in dd-mm-yy format"}

**DGS\_INT\_generateRecordData\_OneToMany**

**Connected System \***  
DGS CS Data Generation

**Relationship \***  
One to Many

Provide the relationship between the record. Valid values: ONE\_TO\_ONE, ONE\_TO\_MANY, MANY\_TO\_ONE.

**Primary Record Last Row**  
r!primaryRecordLastRow

JSON string from the last row of the primary record type to generate. Use the recordqueryhelper function to retrieve this data. The input of recordqueryhelper should be the Record Type to generate, wrapped in a toxml() function. An example of this format: recordqueryhelper(toxml(recordType(recordName)))

**Related Records Last Row**

Rule Input Name	Expression	Value
primaryRecordLastRow (Text)	recordqueryhelper(toxml(recordType(DGS)))	{"name":"DGS Student","lastRow": {"primaryKeyName":"studentId","fields": {"studentId","studentName","birthDate","gradeLevel...More

Place cursor on function, rule, or constant to display help

**TEST REQUEST**

**Result** Request Response

**Success!**

**Time**  
5,722 ms  
Prepare: < 1 ms - Execute: 5,722 ms (Send/Wait/Receive: 1 ms) - Transform: < 1 ms

**Value: Result**

- Dictionary
  - relatedRecordsData List of Dictionary - 1 item
    - Dictionary
      - data List of Dictionary - 4 items
        - Dictionary
          - studentId 15 (Number (Decimal))
          - parentName "Emma Wilson" (Text)
          - parentEmail "emmawilson@mail.com" (Text)
          - parentId 20 (Number (Decimal))
          - parentPhone "9876-5432" (Text)
        - Dictionary
          - studentId 15 (Number (Decimal))
          - parentName "Oliver Johnson" (Text)
          - parentEmail "oliverjohnson@mail.com" (Text)

## Output: Dictionary

```
{relatedRecordsData: {{data: {{studentId: 15, parentName: "John Thompson", parentEmail: "johnthompson@mail.com", parentId: 20, parentPhone: "5678-9012"}, {studentId: 15, parentName: "Sarah Johnson", parentEmail: "sarahjohnson@mail.com", parentId: 21, parentPhone: "3456-7890"}, {studentId: 16, parentName: "Michael Smith", parentEmail: "michaelsmith@mail.com", parentId: 22, parentPhone: "6789-0123"}, {studentId: 16, parentName: "Jessica Wilson", parentEmail: "jessicawilson@mail.com", parentId: 23, parentPhone: "9012-3456"}}, name: "DGS Parent"}}, success: true, primaryRecordData: {data: {{studentId: 15, gradeLevel: 10, studentName: "Isabella Thompson", birthDate: "2006-05-20"}, {studentId: 16, gradeLevel: 11, studentName: "Oliver Johnson", birthDate: "2005-09-13"}}, name: "DGS Student"}}
```

### 3. Many to One relationship

#### Inputs:

**Primary Record Last Row** (Text) - Required - JSON string from the last row of the primary record type to generate. Use the recordqueryhelper function to retrieve this data. The input of recordqueryhelper should be the Record Type to generate, wrapped in a toxml() function. An example of this format: recordqueryhelper( toxml( recordType!{recordName} ) )

**Related Records Last Row** (List of Text) – Optional - Details of the records related to the primary record. If the primary record generated references another record by a foreign key in a 1 to many relationship, add the related record in a list here. This record input will follow the same format as above where each record must be wrapped in a recordqueryhelper() and a toxml() function. More instructions on this format:

Provide the JSON strings returned from the recordqueryhelper function in List of Text format. Example: { recordqueryhelper(toxml(recordType!{recordType1})), recordqueryhelper(toxml(recordType!{recordType2})) }

**Number of Rows of Primary Record** (Integer) – Optional - Provide the number of Primary Record Rows to be generated. Default: 1

**Number of Primary Record Rows per Related Record** (Integer) – Optional - Provide the number of primary record rows per related record generated. This number will define the “many” in the many to one relationship being generated. For example, if you would like to create student and parent records in a 3:1 relationship, where every every three students reference the same parent, input 3 in this field. Default: 1

**Custom Instructions**(List of Text) – Optional - Provide any additional instructions for the data generation in a list of text. These instructions can be written in natural language. Example: { “all emails should be gmail accounts”, “generate any dates in dd-mm-yy format”}

DGS\_INT\_generateRecordData\_ManyToOne

**Connected System \***

DGS CS Data Generation

**Relationship \***

Many to One

Provide the relationship between the record. Valid values: ONE\_TO\_ONE, ONE\_TO\_MANY, MANY\_TO\_ONE.

**Primary Record Last Row**

rlprimaryRecordLastRow

JSON string from the last row of the primary record type to generate. Use the recordqueryhelper function to retrieve this data. The input of recordqueryhelper should be the Record Type to generate, wrapped in a toxml() function. An example of this format: recordqueryhelper( toxml( recordType!(recordName) ) )

**Related Records Last Row**

```
1 | ri!relatedRecordsLastRow
```

Place cursor on function, rule, or constant to display help

TEST REQUEST

Rule Input Name	Expression	Value
primaryRecordLastRow (Text)	<pre>1 recordqueryhelper( 2 toxml( recordType!DGS 3 )</pre>	<pre>{"name":"DGS Parent","lastRow":{"primaryKeyName":"parentid","fields":{"parentid","studentid","parentName","parentEmail"...</pre> <p style="font-size: 0.8em; color: #00aaff;">More</p>
relatedRecordsLastRow (List of Text String)	<pre>1 { 2 recordqueryhelper( 3 toxml( recordType! 4</pre>	<pre>List of Text String: 1 item {"name":"DGS Student","lastRow":{"primaryKeyName":"studentid","field</pre>

Result Request Response

Success!

**Time**  
6,213 ms  
Prepare: < 1 ms - Execute: 6,213 ms (Send/Wait/Receive: 1 ms) - Transform: < 1 ms

**Value: Result**

- Dictionary
  - relatedRecordsData List of Dictionary - 1 item
    - Dictionary
      - data List of Dictionary - 2 Items
        - Dictionary
          - studentId **15** (Number (Decimal))
          - gradeLevel **12** (Number (Integer))
          - studentName **"Ethan Smith"** (Text)

## Output: Dictionary

```
{relatedRecordsData: {{data: {{studentId: 17, gradeLevel: 10, studentName: "Emily Wilson",
birthDate: "2004-07-17"}, {studentId: 18, gradeLevel: 11, studentName: "Michael Anderson",
birthDate: "2003-09-08"}}}, name: "DGS Student"}}}, success: true, primaryRecordData: {data:
{{studentId: 17, parentName: "Olivia Smith", parentEmail: "oliviasmith@mail.com", parentId:
24, parentPhone: "2734-9502"}, {studentId: 17, parentName: "Emma Johnson", parentEmail:
"emmajohnson@mail.com", parentId: 25, parentPhone: "3847-2034"}, {studentId: 17,
parentName: "Ava Davis", parentEmail: "avadavis@mail.com", parentId: 26, parentPhone:
"1023-8394"}, {studentId: 18, parentName: "Sophia Williams", parentEmail:
"sophiawilliams@mail.com", parentId: 27, parentPhone: "3947-5832"}, {studentId: 18,
parentName: "Charlotte Brown", parentEmail: "charlottebrown@mail.com", parentId: 28,
parentPhone: "2039-4958"}, {studentId: 18, parentName: "Amelia Garcia", parentEmail:
"ameliagarcia@mail.com", parentId: 29, parentPhone: "5839-1039"}}}, name: "DGS Parent"}}
```



## Data Generator Sample App Setup

To configure the sample app to begin experimenting with the GenAI Tool: Data Generator, complete the following steps.

1. **Download the necessary files:** Find the Data Generator Connected System from Appian's App Market. Select download and open the zip file to access the Sample Application (.zip), an SQL script (.sql), a Sample App Properties file (.properties), and the plug-in jar file (.jar).
2. **Import the sample data:** In your Appian Cloud Database, select the database where you would like to create a new table for the sample record data. Select Import and "Choose File." Select the SQL file from the downloaded package and hit the "Import" button.
3. **Configure the properties file:** In the properties file downloaded from the AppMarket, add your API key to either the OpenAI or Azure OpenAI API key variable, depending on your preference and your models available.

```
## Connected System: DGS CS Data Generation OpenAI
connectedSystem._a-0000eaac-2ee0-8000-62ea-01ef9001ef90_4507668.openaiApiKey=
```

Source” in the top right of each Data Model view. Connect to the table in your database that was created with the SQL script in step #2.

6. **Explore the tool:** You can now freely experiment with the Data Generation tool from the sample application. Each relationship available in the integration has been preconfigured in the interface, all you need to do is:
  - a. Select the relationship to generate
  - b. Enter the number of records to generate
  - c. Determine the “Many” in the “One to Many” or “Many to One” relationship, if appropriate
  - d. Enter custom instructions if desired, this is optional.
  - e. Select “Generate” to view the generated data. Edit the data in the editable grid that appears below to your specifications.
  - f. Select “Write to Records” and view the new data in the record view tabs available in the sample app tabs.

## Cost Metrics

The below metrics are for a reference on the cost incurred in the Query Documents Integration for the records DGS Parent, DGS Student and DGS Student Contact in a single request. This pricing is consistent between both OpenAI and AzureOpenAI models.

Number of Rows	Tokens used	Cost incurred	
		GPT 3.5 Turbo	GPT 4
5	731	\$0.0014	\$0.043
10	1044	\$0.0020	\$0.062
20	1747	\$0.0034	\$0.105
30	2314	\$0.0046	\$0.139