# Building a Chat Bot with the Azure Bot Service

Software bots are everywhere. You probably interact with them every day without realizing it. Bots, especially chat and messenger bots, are changing the way we interact with businesses, communities, and even each other. Thanks to light-speed advances in artificial intelligence (AI) and the ready availability of AI services, bots are not only becoming more advanced and personalized, but also more accessible to developers.

Regardless of the target language or platform, developers building bots face a variety of challenges. Bots must be able process input and output intelligently. Bots need to be responsive, scalable, and extensible. They need to work cross-platform, and they need to interact with users in a conversational manner and in the language that the user chooses.

The Azure Bot Service, combined with Microsoft QnA Maker, provide the tools developers need to build and publish intelligent bots that interact naturally with users using a range of services. In this lab, you will create a bot using the Azure Bot Service and connect it to a knowledge base built with QnA Maker. Then you will interact with the bot using Skype — one of many popular services with which bots built with the Azure Bot Service can integrate.
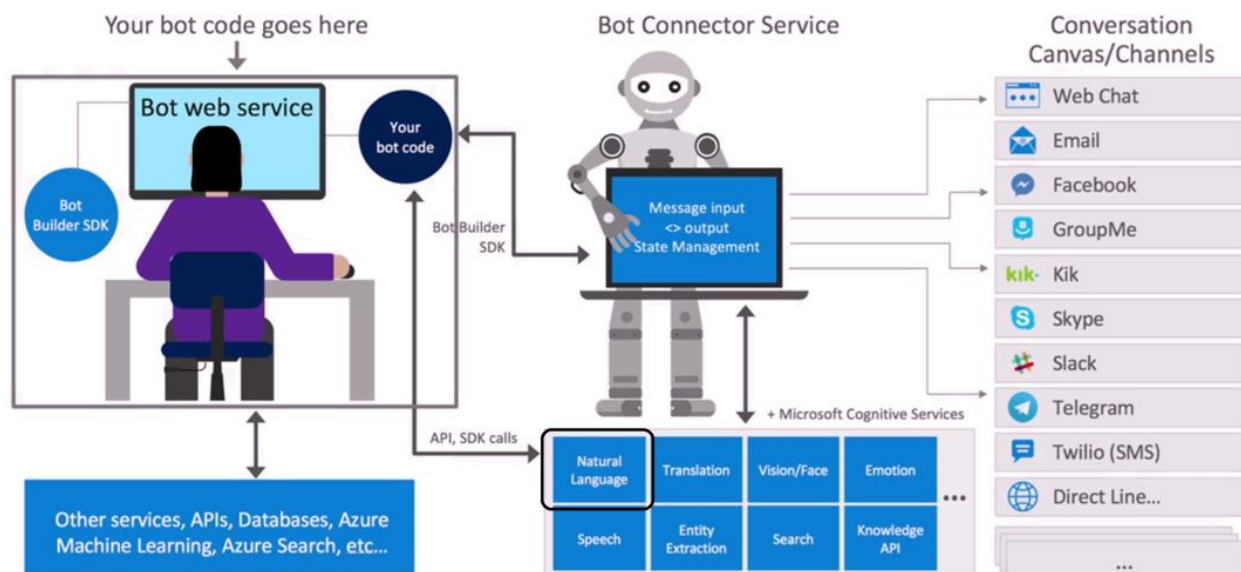
Objectives

In this hands-on lab, you will learn how to:

- Create a QnA Maker knowledge base
- Publish a QnA Maker knowledge base
- Integrate a knowledge base with Azure Bot Service
- Chat with the bot to verify the code is working
- Add Chit-chat personality at your knowledge base

Prerequisites

The following are required to complete this hands-on lab:

- Azure Pass or subscription - [Try it for Free](#)

Case description

A bot is an autonomous program that interacts with people or computer systems in a predictable way. The logic behind a bot is designed and programmed by the bot creator, often with the help of tools like the Microsoft Bot Framework. Microsoft also has other AI services, included in Azure Cognitive Services, that can enhance the capabilities of your bots.

QnA Maker is one of the AI services that can help a bot answer your users' natural language questions by matching them with the best possible answers from your knowledge base.

What is the QnA Maker

QnA Maker is a cloud-based Natural Language Processing (NLP) service that easily creates a natural conversational layer over your data. It can be used to find the most appropriate answer for any given natural language input, from your custom knowledge base (KB) of information.

A client application for QnA Maker is any conversational application that communicates with a user in natural language to answer a question. Examples of client applications include social media apps, chat bots, and speech-enabled desktop applications.

Exercise 1: Create a knowledge base from QnA Maker Portal

Create a knowledge base

1. Sign in to the [QnA Maker](#) portal.

2. Select **Create a knowledge base** from the top menu.
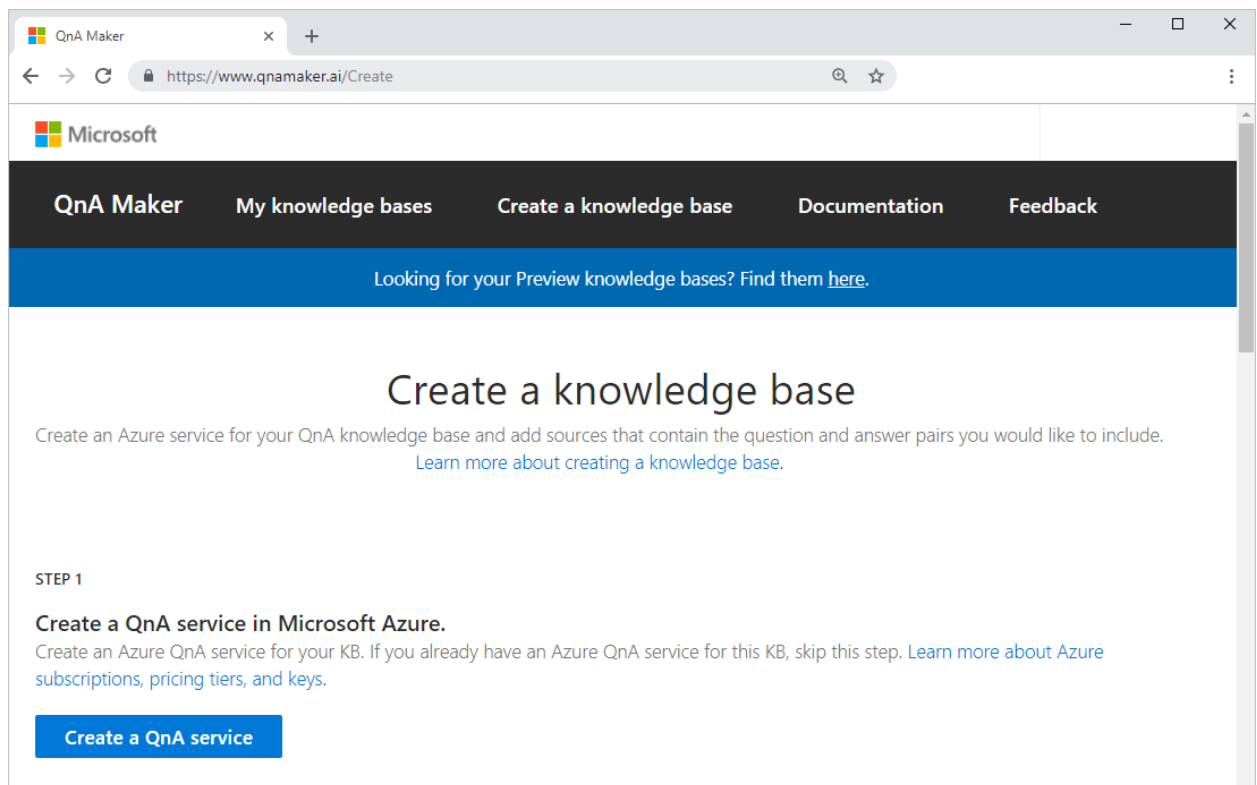
3. Select Create a QnA service. You will be redirect on Azure Portal.

4. Provide the required information:

    1. **Name:** chatbot-qna-
    2. **Subscription:** Select your existing subscription
    3. **Pricing tier:** Select F0 (3 Calls per second)
    4. **Resource group:** Clic on Create new and type the name qna-lab-rg
    5. **Resource group location:** Select Central US (or nearest region)

6. **Search pricing tier:** Select F (3 Indexes)
7. **Search Location:** Select Central US (or nearest region)
8. **App name:** chatbot-qna-
9. **Website Location:** Select Central US (or nearest region)
10. **Application Insights Location:** Select Central US (or nearest region)

Home > Create

Create
QnA Maker

Name *

chatbot-qna-hinault   ✓

Subscription *

Microsoft Azure Sponsorship   ∨

Pricing tier (View full pricing details) *

F0 (3 managed documents per month, 3 transactions per second, 100 transactions per minute, 50K transactions per... ∨

Resource group *

(New) chatbot-qna-hinault   ∨

Create new

Resource group location * ⓘ

(Canada) Canada Central   ∨

Azure Search pricing tier (View full pricing details) *

F (3 Indexes)   ∨

Azure Search location *

(Canada) Canada Central   ∨

[**Create**]   Automation options

5.

6. Click Create to deploy the service. This step might take a few moments.

7. Once the deployment is complete, return to QnA Maker portal and click Refresh on step 2.

8. Select your existing settings:

Setting	Purpose
Microsoft Azure Directory ID	This ID is associated with the account you use to sign into the Azure portal and the QnA Maker portal.
Azure Subscription name	The billing account in which you created the QnA Maker resource.
Azure QnA Service	Your existing QnA Maker resource.

STEP 2

Connect your QnA service to your KB.
After you create an Azure QnA service, refresh this page and then select your Azure service using the options below

Refresh

* Microsoft Azure Directory ID

Hinault ▾

* Azure subscription name

Microsoft Azure Sponsorship ▾

* Azure QnA service

chatbot-qna-hinault ▾

* Language

English ▾

9.

10. Enter your knowledge base name, AI Bootcamp kb.

STEP 3

Name your KB.
The knowledge base name is for your reference and you can change it at anytime.

* Name

AI Bootcamp kb

Populate your knowledge base with the following settings:

11.

Setting name	Setting value	Purpose
URL	https://docs.microsoft.com/azure/cognitive-services/qnamaker/faqs	The contents of the FAQ at that URL are formatted with a question followed by an answer. QnA Maker can interpret this format to extract questions and the associated answers.
File	*not used in this tutorial*	This uploads files for questions and answers.
Chit-chat personality	None	This gives a friendly and casual personality to common questions and answers. You can edit these questions and answers later.

URL

https://docs.microsoft.com/azure/cognitive-services/qnamaker/faqs

+ **Add URL**

File name

+ **Add file**

Chit-chat

Give your bot the ability to answer thousands of small-talk questions in a voice that fits your brand. When you add chit-chat to your knowledge base by selecting a personality below, the questions and responses will be automatically added to your knowledge base, and you'll be able to edit them anytime you want. Learn more about chit-chat.

- ◉ None
- ○ Professional
- ○ Friendly
- ○ Witty
- ○ Caring
- ○ Enthusiastic

12.

13. Select **Create your KB** to finish the creation process.

STEP 5

Create your KB
The tool will look through your documents and create a knowledge base for your service. If you are not using an existing document, the tool will create an empty knowledge base table which you can edit.

Create your KB

14.

Review, save, and train the knowledge base

1. Review the questions and answers.

2.

3. Select **Test** in the top menu bar.

4. Type **how large** on the text box.

5. Select Inspect. You can add alternative phrasing for this Answer or new answer for this question, if you think the answer is wrong.
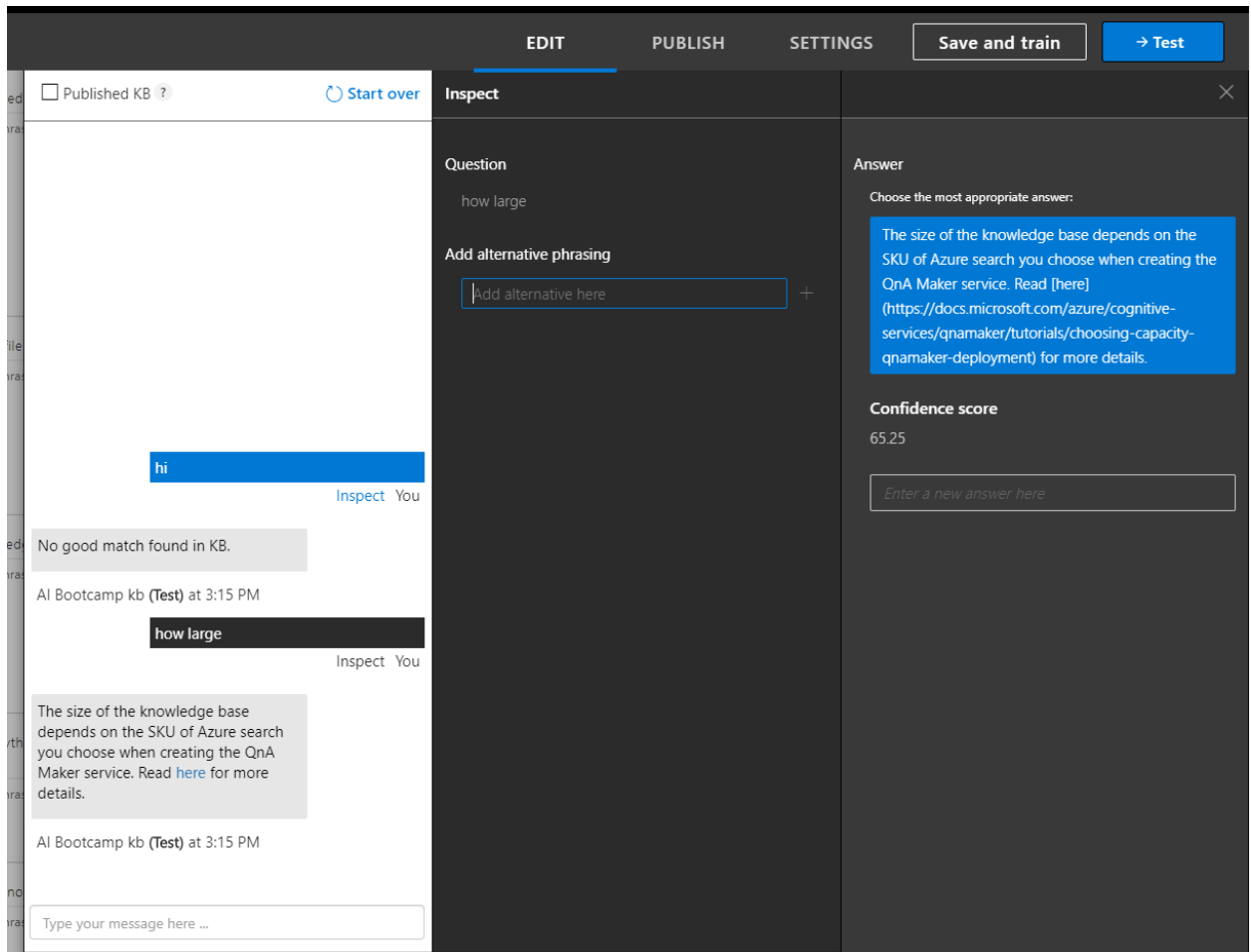
6.

7. Select **Save and train** in the top menu bar.

Publish to get knowledge base endpoints

Select the **Publish** button from the top menu. On the publish page, select **Publish**.

After the knowledge base is published, the endpoint is displayed.

Don't close this **Publish** page. You need it later in the tutorial, to create a bot.

Use cURL to query for an FAQ answer

1. Select the **Curl** tab.

Postman | **Curl**

```
curl -X POST https://chatbot-qna-hinault.azurewebsites.net/qnamaker/knowledgebases/1 ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶5-
865 ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶/generateAnswer -H "Authorization: EndpointKey 6e ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶ ̶7 ̶ ̶f-
8 ̶ ̶ ̶ ̶ ̶ ̶9" -H "Content-type: application/json" -d "{'question':'<Your question>'}"
```

1. Copy the text of the **Curl** tab, and run it in a cURL-enabled terminal or command-line. The authorization header's value includes the text Endpoint, with a trailing space and then the key.
2. Replace <Your question> with How large can my KB be?. This is close to the question, How large a knowledge base can I create?, but not exactly the same. QnA Maker applies natural language processing to determine that the two questions are the same.

3. Run the cURL command and receive the JSON response, including the score and answer.

```
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   581  100   543  100    38    418     29  0:00:01  0:00:01 --:--:--   447{
  "answers": [
    {
      "questions": [
        "How large a knowledge base can I create?"
      ],
      "answer": "The size of the knowledge base depends on the SKU of Azure search you choose when creatir
      "score": 35.92,
      "id": 2,
      "source": "https://docs.microsoft.com/azure/cognitive-services/qnamaker/faqs",
      "metadata": []
    }
  ]
}
```

4. ◄ _____ ►

5. QnA Maker is somewhat confident with the score of 35.92%.

Use cURL to query for the default answer

Any question that QnA Maker is not confident about receives the default answer. This answer is configured in the Azure portal.

1. In the cURL-enabled terminal, replace How large can my KB be? with x.

2. Run the cURL command and receive the JSON response, including the score and answer.

```
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   186  100   170  100    16    272     25 --:--:-- --:--:-- --:--:--   297{
  "answers": [
    {
      "questions": [],
      "answer": "No good match found in KB.",
      "score": 0.0,
      "id": -1,
      "metadata": []
    }
  ]
}
```
3.
4. QnA Maker returned a score of 0, which means no confidence. It also returned the default answer.

Create a QnA Bot

Create a bot as a client application for the knowledge base.

1. In the QnA Maker portal, go to the **Publish** page, and publish your knowledge base. Select **Create Bot**.

Success! Your service has been deployed. What's next?

You can always find the deployment details in your service's settings.

Create Bot

<u>View</u> all your bots on the Azure Portal.

Use the below HTTP request to call your Knowledgebase. <u>Learn more.</u>

Postman   Curl

```
POST /knowledgebases/1~~~~~~~~~~~~~~~~~-865a-5~5~5~~~3b0d/generateAnswer
Host: https://chatbot-qna-hinault.azurewebsites.net/qnamaker
Authorization: EndpointKey 6e~~~~~~~~~~~~~~~~~~~~~~~~~~~~95a9
Content-Type: application/json
{"question":"<Your question>"}
```

Need to fine-tune and refine? Go back and keep editing your service.

Edit Service

1.

2. The Azure portal opens with the bot creation configuration.

3. Enter the settings to create the bot:

Setting	Value	Purpose
Bot name	aibootcamp-qna-bot	This is the Azure resource name for the bot.
Subscription	See purpose.	Select the same subscription as you used to create the QnA Maker resources.
Resource group	lab-rg-bot	The resource group used for all the bot-related Azure resources.
Location	Canada East	The bot's Azure resource location.
Pricing tier	F0	The free tier for the Azure bot service.

Setting	Value	Purpose
App name	aibootcamp-qna-bot-app	This is a web app to support your bot only. This should not be the same app name as your QnA Maker service is already using. Sharing QnA Maker's web app with any other resource is not supported.
SDK Language	C#	This is the underlying programming language used by the bot framework SDK. Your choices are C# or Node.js.
QnA Auth Key	**Do not change**	This value is filled in for you.
App service plan/Location	**Do not change**	For this tutorial, the location is not important.
Azure Storage	**Do not change**	Conversation data is stored in Azure Storage tables.
Application Insights	**Do not change**	Logging is sent to Application Insights.
Microsoft App ID	**Do not change**	Active directory user and password is required.

Web App Bot

Bot Service

☐ ✕

Bot handle * ⓘ

aibootcamp-qna-bot ✓

Subscription *

Microsoft Azure Sponsorship ⌄

Resource group *

Lab-Rg-Bot ⌄

Create new

Location * ⓘ

Canada Central ⌄

Pricing tier (View full pricing details)

F0 (10K Premium Messages) ⌄

App name * ⓘ

aibootcamp-qna-bot-app ✓

.azurewebsites.net

SDK language *

⦿ C#   ◯ Node.js

QnA Auth Key * ⓘ

6e14d955-c228-4cb7-ad9f-8a9494c305a9

---

*App service plan/Location

aspnett25-plan/South Central ...   ›

Application Insights ⓘ

[**On**   Off]

Application Insights Location * ⓘ

East US ⌄

Microsoft App ID and password ⓘ
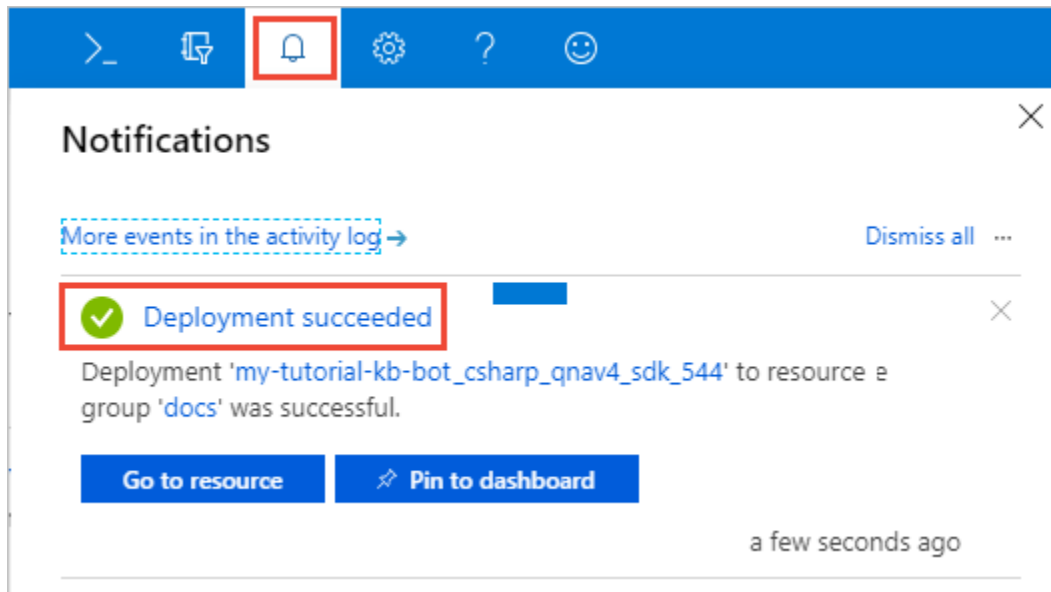
Auto create App ID and passw...   ›


Create   Automation options

4.

5. Wait a couple of minutes until the bot creation process notification reports success.

Chat with the Bot

In the Azure portal, open the new bot resource from the notification.

From **Bot management**, select **Test in Web Chat** and enter: How large can my KB be?. The bot will respond with:
The size of the knowledge base depends on the SKU of Azure search you choose when creating the QnA Maker service. Read [here](https://docs.microsoft.com/azure/cognitive-services/qnamaker/tutorials/choosing-capacity-qnamaker-deployment)for more details.
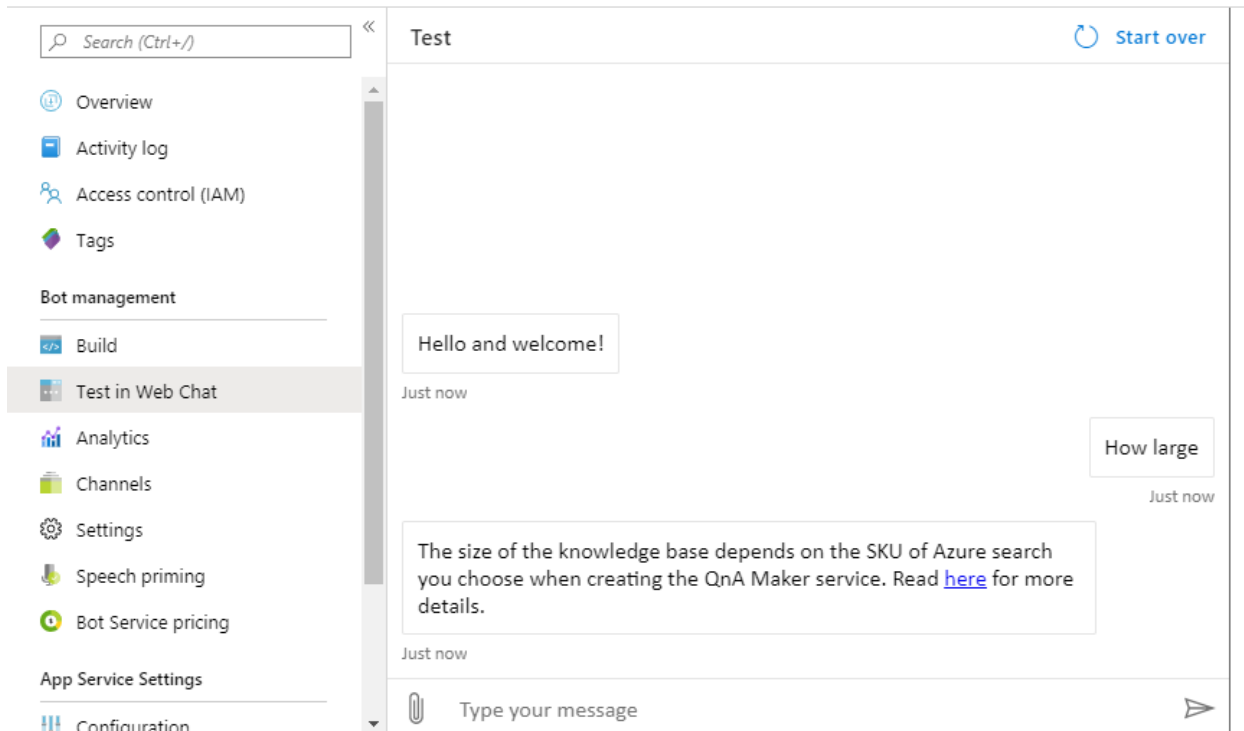
Add personality with Chit-Chat

Adding chit-chat to your bot makes it more conversational and engaging. The chit-chat feature in QnA maker allows you to easily add a pre-populated set of the top chit-chat, into your knowledge base (KB). This can be a starting point for your bot's personality, and it will save you the time and cost of writing them from scratch.

This dataset has about 100 scenarios of chit-chat in the voice of multiple personas, like Professional, Friendly and Witty.

Some examples of the different personalities are below. You can see all the personality datasets along with details of the personalities.

For the user query of When is your birthday?, each personality has a styled response:

Personality	Example
Professional	Age doesn't really apply to me.
Friendly	I don't really have an age.

Personality	Example
Witty	I'm age-free.
Caring	I don't have an age.
Enthusiastic	I'm a bot, so I don't have an age.

Add Chit-Chat in your KB

1. Download the English friendly datasets on GitHub

2. Go to qnamaker.ai portal. Select your KB and select **Settings** from the top menu.

3. Scroll down to **Manage knowledge base**

4. On **File name** sub section, click on **Add file** and add qna_chitchat_friendly.tsv file.

1. Click **Save and Train** from top menu.

2. Click on **Edit** for review the questions and answers.

3. Select the last page of questions and answers from the bottom of the table. The page shows questions and answers from the Chit-chat personality.

4. From the toolbar above the list of questions and answers, select the View options icon, and then select Show metadata. This shows the metadata tags for each question and answer. The Chit-chat questions have the editorial: chit-chat metadata already set. This metadata is returned to the client application, along with the selected answer. The client application, such as a chat bot, can use this filtered metadata to determine additional processing or interactions with the user.

Knowledge base

| Search the knowledge base ✕ | 117 QnA pairs | ＋ Add QnA pair ✓ Accept ✕ Reject ▦ View options |

Filter by suggestions ⬤

| 1 | 2 | 3 | 4 | 5 | ... | 10 | Next › |

Question	Answer	Metadata tags ?
⌄ Source: https://docs.microsoft.com/azure/cognitive-services/qnamaker/faqs		
⌃ Source: qna_chitchat_the_friend.tsv		
What's your age? ✕	I don't really have an age.	editorial : chitchat ✕
Are you young? ✕	＋ Add follow-up prompt	＋
When were you born? ✕		
What age are you? ✕		
Are you old? ✕		
How old are you? ✕		
How long ago were you born? ✕		
＋ Add alternative phrasing		
Ask me anything ✕	I'm a much better answerer than asker.	editorial : chitchat ✕
Ask me a question ✕	＋ Add follow-up prompt	＋
Can you ask me a question? ✕		
Ask me something ✕		
What do you want to know about me? ✕		
＋ Add alternative phrasing		
Can you sleep? ✕	I don't have the hardware for that.	editorial : chitchat ✕
Do you have boogers? ✕	＋ Add follow-up prompt	＋
Don't you ever sleep? ✕		
Do you dream? ✕		
Do you smell? ✕		
Do you sweat? ✕		
Do you get tired? ✕		

1. Select the **Publish** button from the top menu. On the publish page, select **Publish**.

Use cURL to query for a Chit-chat answer

1. In the cURL-enabled terminal, replace How large can my KB be? with a bot conversation-ending statement from the user, such as Thank you.

2. Run the cURL command and receive the JSON response, including the score and answer.

```
 3.   % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
 4.                                  Dload  Upload   Total   Spent    Left  Speed
 5. 100  525 100  501 100   24   525     25 --:--:-- --:--:-- --:--:--  550{
 6.    "answers": [
 7.      {
 8.        "questions": [
 9.          "Thank you",
10.          "Thanks",
11.          "Thnx",
12.          "Kthx",
13.          "I appreciate it",
14.          "Thank you so much",
15.          "I thank you",
16.          "My sincere thank"
17.        ],
18.        "answer": "You're very welcome.",
19.        "score": 100.0,
20.        "id": 109,
21.        "source": "qna_chitchat_the_friend.tsv",
22.        "metadata": [
23.          {
24.            "name": "editorial",
25.            "value": "chitchat"
26.          }
27.        ]
28.      }
29.    ]
30. }
31.
```

Because the question of Thank you exactly matched a Chit-chat question, QnA Maker is completely confident with the score of 100. QnA Maker also returned all the related questions, as well as the metadata property containing the Chit-chat metadata tag information.

Chat with the bot

Go back in **Test in Web Chat** on Azure Portal and chat with your bot.
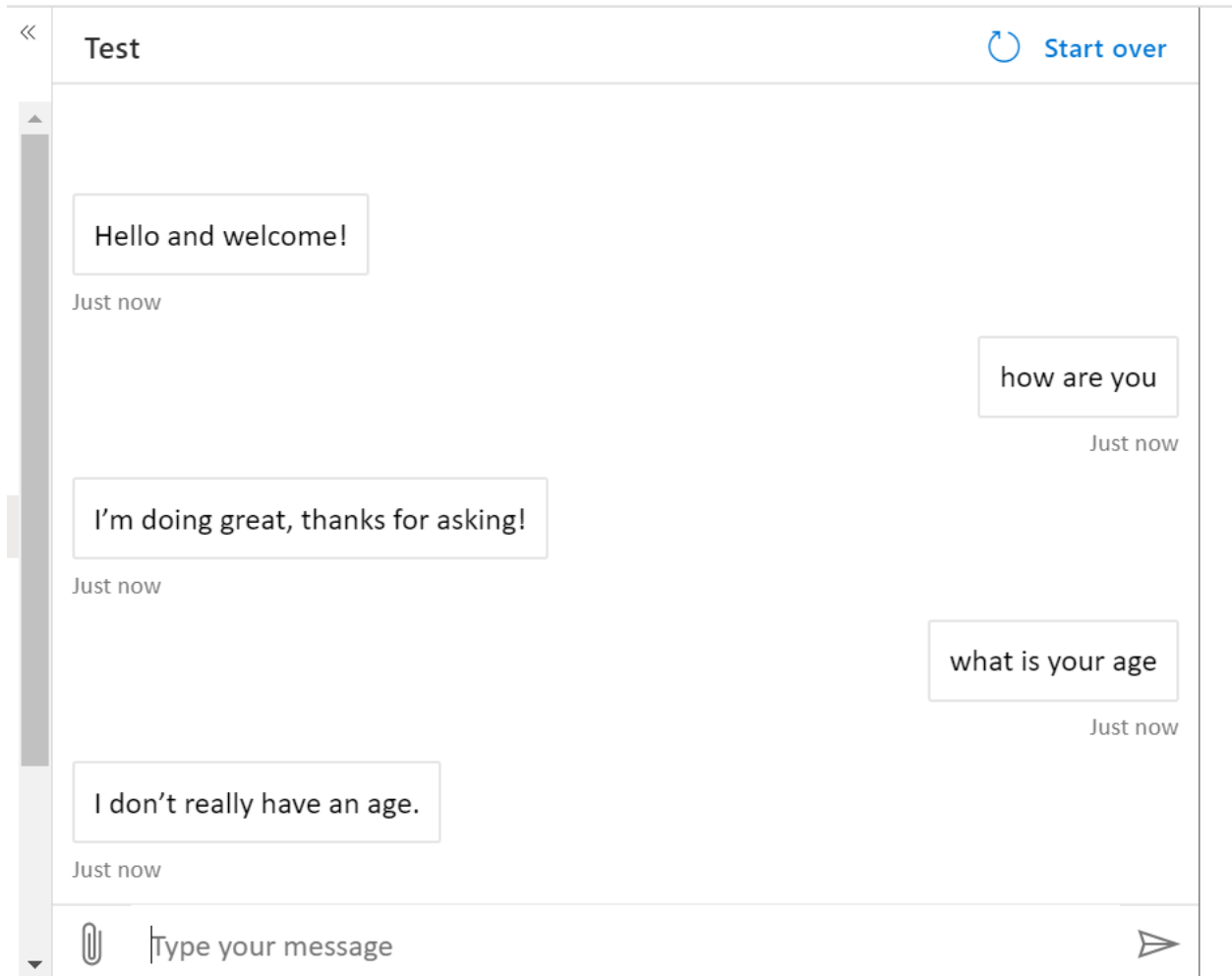
Clean up resources

Finally, If you don't expect to need these resources in the future, you can delete them by deleting the resource group. To do so, select the resource group for this workshop, select Delete, then confirm the name of the resource group to delete.