



Week 7

Artificial Intelligence Program Infrastructure and Architecture

Assignments [60%]

EXAMS [40%]

> Agenda // Program

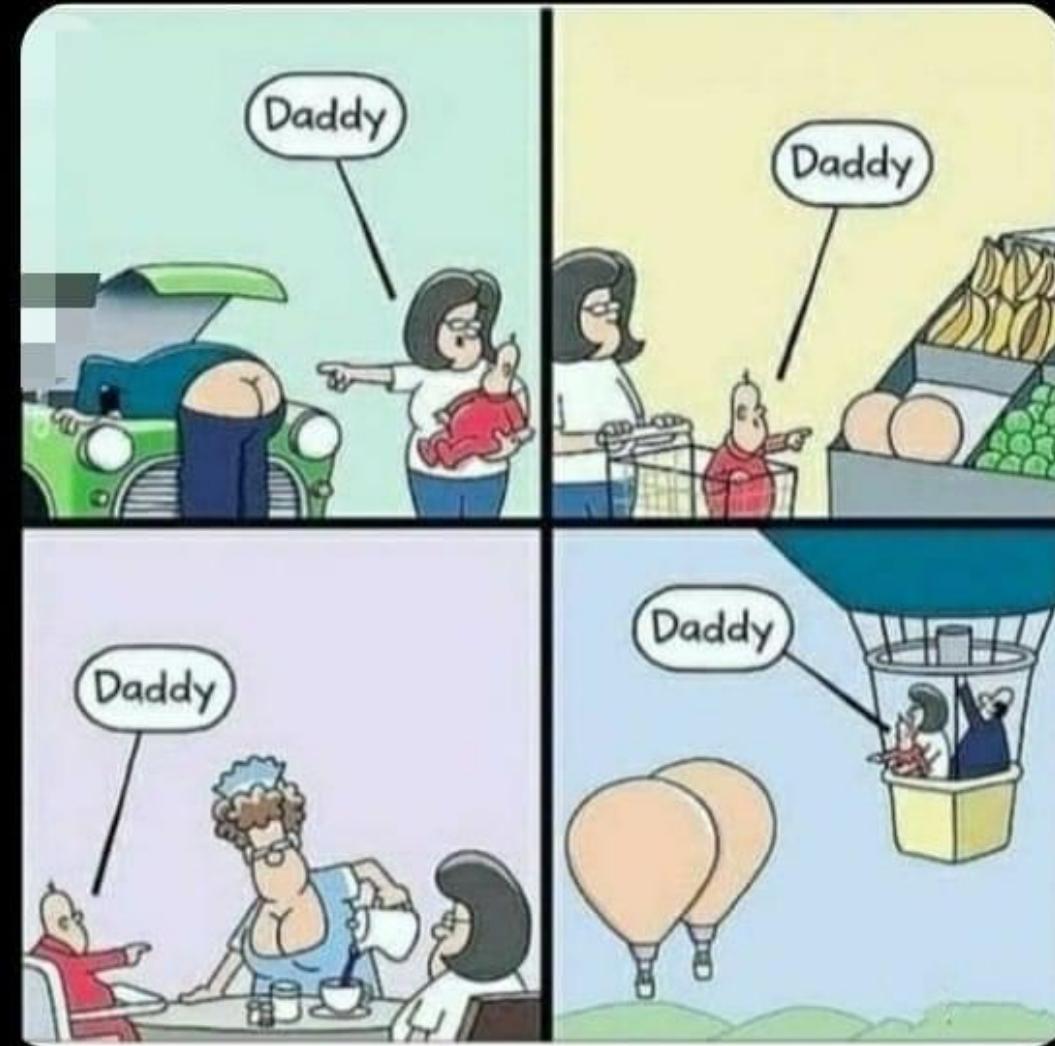
WEEK	SUBJECT	ASSIGNMENT / TO BE DELIVERED	DATES
2	Intro / AI Function / Enablers		Sep 13
3	Infra and Architecture / On-prem vs. Cloud / CSPs		Sep 20
4	Data Pipeline / Processes / Framework / AutoML	#1 Image Classifier [5%]	Sep 27
5	Data Pipeline / Processes / Framework / AutoML		Oct 4
6	More Data / SSIS / ADF / Data Quality	#2 Machine Learning Studio [10%]	Oct 11
7	Azure services – Intro	EXAM 1 [20%]	Oct 18
8	READING WEEK	NO CLASSES	Oct 25
9	Azure services – Cognitive Services 1		Nov 1
10	Azure services – Cognitive Services 2	#3 Draw your own Architecture [5%]	Nov 8
11	Azure services – Cognitive Services 3		Nov 15
12	Azure services – Cognitive Services 4	#4 Azure pipeline // Sentiment Analysis [20%]	Nov 22
13	AWS Academy – Cloud Foundations 		Nov 29
14	AWS Academy – Machine Learning 	#5 AWS Academy – Cloud Foundations [10%]	Dec 6
15	Enterprise Architecture	EXAM 2 [20%]	Dec 13

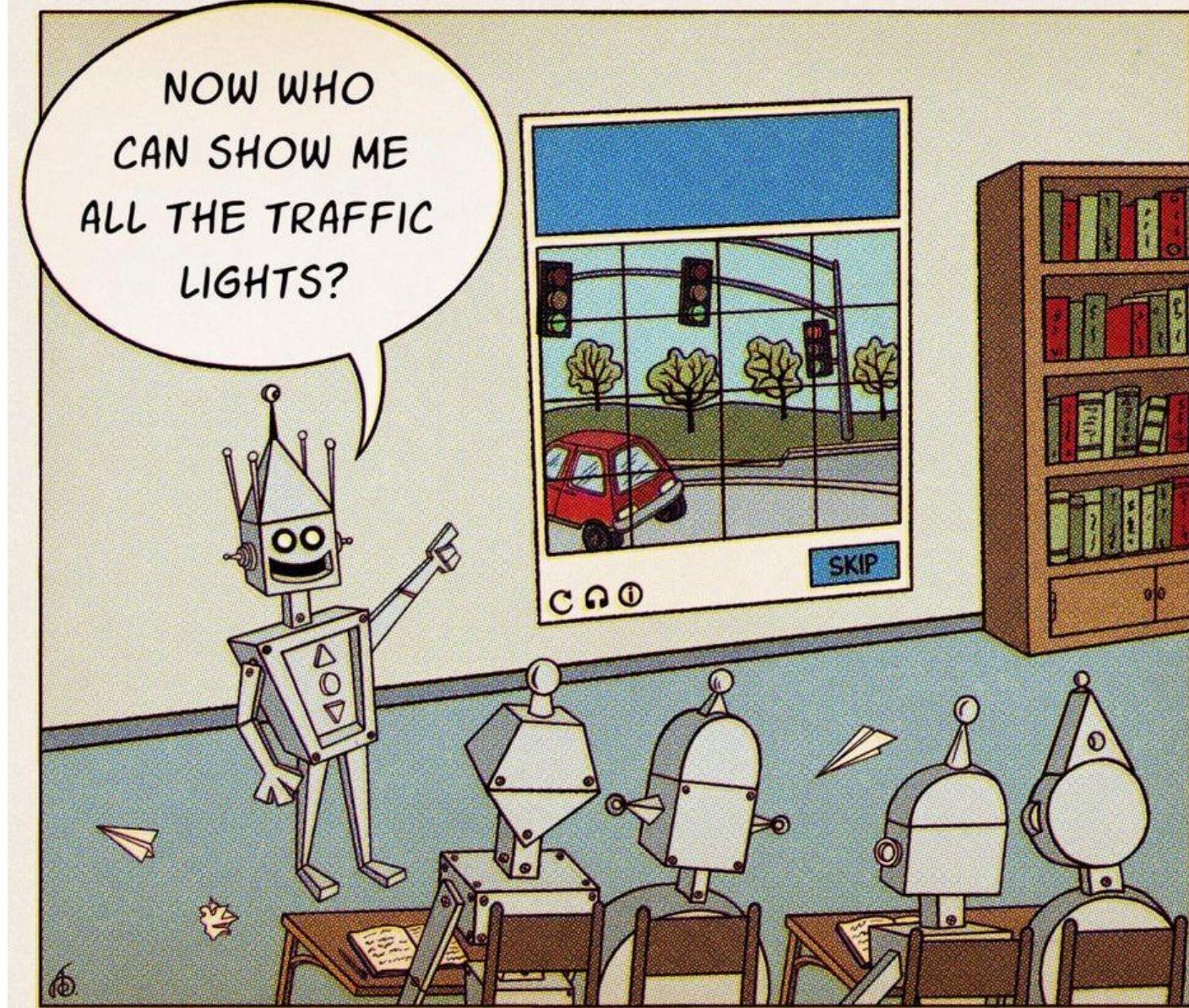
> Agenda

- Modern Data Platform Concepts
 - Data Lake
 - Azure Data Lake Storage Gen2
 - Azure ML
 - Azure AI
 - Event Hubs / Example
 - Stream Analytics
- Developing your own Architecture
 - Practice exercise – drawing your own architecture

Machine Learning and AI be like..

fb.me/yuva.krishna.memes





@ROBOTOPIAWEEKLYCOMIC

Azure Week 2

Microsoft



Modern Data Platform Concepts

The Modern Data Problem

How to derive value from data:

- What happened historically?
- What is happening now?
- What is going to happen?

Each dimension of data is
constantly expanding

VOLUME

ZB

GB

Batch

Structured
data

Unstructured
data

VELOCITY

Real-time

VARIETY

What is a Data Lake?

It is a central storage repository that holds data coming from many sources in a raw, granular format. It can store **structured, semi-structured, or unstructured data**, which means data ingested quickly and can be kept in a more flexible format for future use cases.

Characteristics



- Schema-on-read (ELT)
- Collection of data, not a platform
- Perfect place for evolving data

Benefits



- Quickly ingest high volumes of diverse data structures
- Enable advanced analytics and data exploration
- Scalability and storage cost reduction

Best Practices



- Data Governance needed to avoid Data Swamp
- Security considerations
- Design your Data Lake
- Metadata management

Data Warehouse or Data Lake?

Answer: both.

	Data Warehouse	Data Lake
Requirements	Relational requirements	Diverse data, scalability, low cost
Data Value	Data of recognised high value	Candidate data of potential value
Data Processing	Mostly refined calculated data	Mostly detailed source data
Business Entities	Known entities, tracked over time	Raw material for discovering entities and facts
Data Standards	Data conforms to enterprise standards	Fidelity to original format and condition
Data Integration	Data integration upfront	Data prep on demand
Transformation	Data transformed, in principle	Data repurposed later, as needs arise
Schema Definition	Schema-on-write	Schema-on-read
Metadata Management	Metadata improvement	Metadata developed on read

Data Lake Design Considerations

Data Lake Zones

Transient Landing Zone

Temporary storage of data to meet regulatory and quality control requirements. Limited access. May not be required depending on requirements.

Raw Zone

Original source of data ready for consumption. Metadata publicly available but access to data still limited.

Trusted Zone

Standardized and enriched datasets ready for consumption to those with appropriate role-based access. Metadata available to all.

Curated/Refined Zone

Data transformed from Trusted Zone to meet specific business requirements.

Sandbox Zone

Playground for Data Scientists for ad hoc exploratory use cases.

Data Governance Considerations

Security and Compliance

Access Control at Folder/File level

Encryption at rest

Metadata Management

Data Quality

Metadata Management

Lifecycle Management

Azure Data Lake Storage Gen2

Azure Data Lake Storage Gen2

A “no-compromises” Data Lake: Secure, performant and massively-scalable

A Data Lake that brings together the cost and scale of object storage with the performance and analytics feature set of data lake storage



Fast

Atomic file operations mean jobs complete faster



Manageable

Automated Lifecycle Policy Management

Object Level tiering



Secure

Support for fine-grained ACLs, protecting data at the file and folder level

Multi-layered protection via at-rest Storage Service encryption & Azure Active Directory integration



Scalable

No limits on data store size

Global footprint (50 regions)



Cost effective

Object store pricing levels

File system operations minimize transactions required for job completion

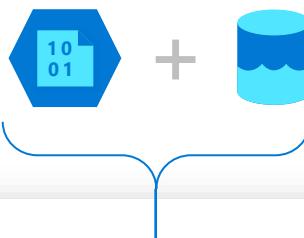


Integration ready

Optimized for Spark and Hadoop Analytic Engines

Tightly integrated with Azure end to end analytics solutions

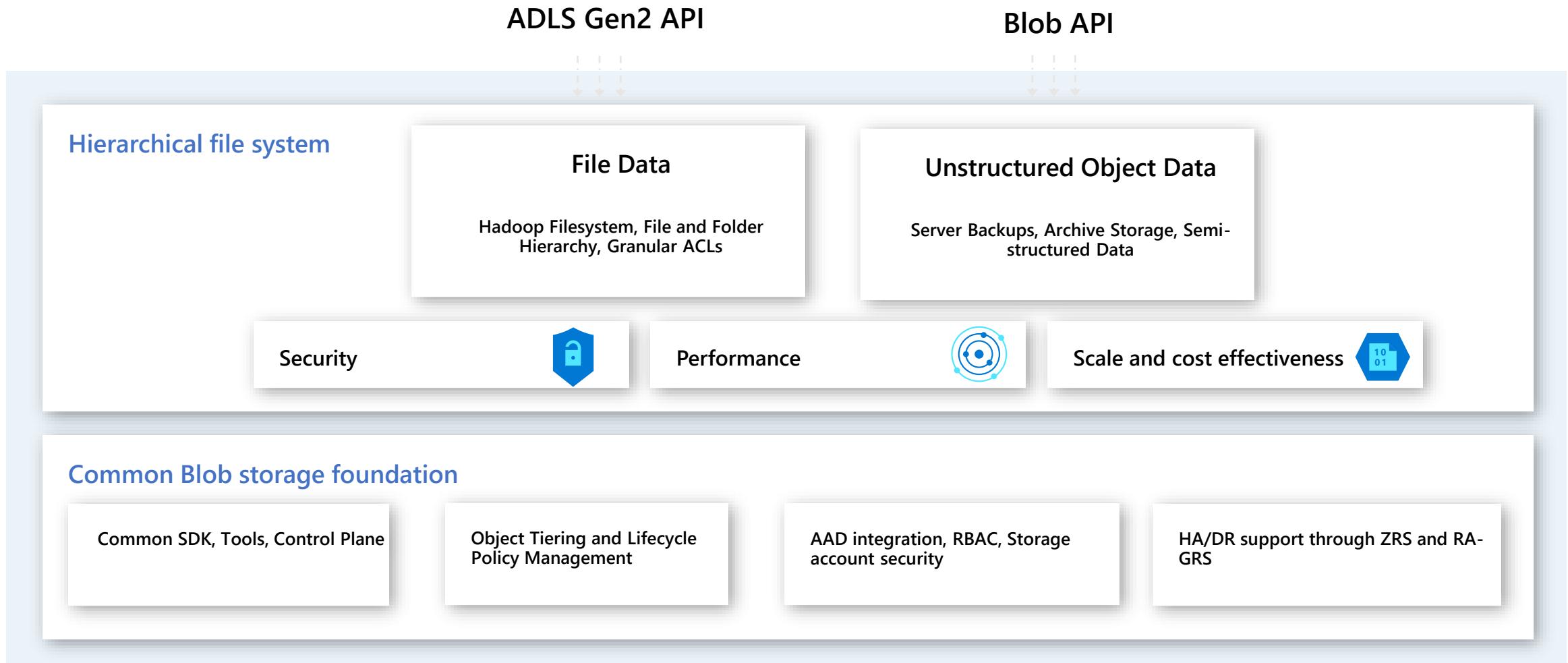
Multiprotocol access



Single service

Azure Data Lake Storage Gen2

High performance HDFS Endpoint to Azure Blob Storage



Modern Data Platform Concepts

What's No-SQL?

Term coined in 2009 for a developer meetup – “Not Only SQL” -> “NoSQL”.

Databases that allow you to store and retrieve data in various structures, formats, and models other than tabular relational model.

There's a time and a place for everything

Sometimes a relational store is the right choice

Sometimes a NoSQL store is the right choice

Sometimes you need more than one store for an app ->
polyglot persistence

Data Structures



Key-Value Databases

Cosmos DB, Redis Cache, Azure Table



Column Family Stores

Cosmos DB, Cassandra, HBase



Graph Databases

Cosmos DB, Neo4j, Gremlin



Document Databases

Cosmos DB, MongoDB

Azure ML

> Azure ML Workspaces

Azure Machine Learning workspaces

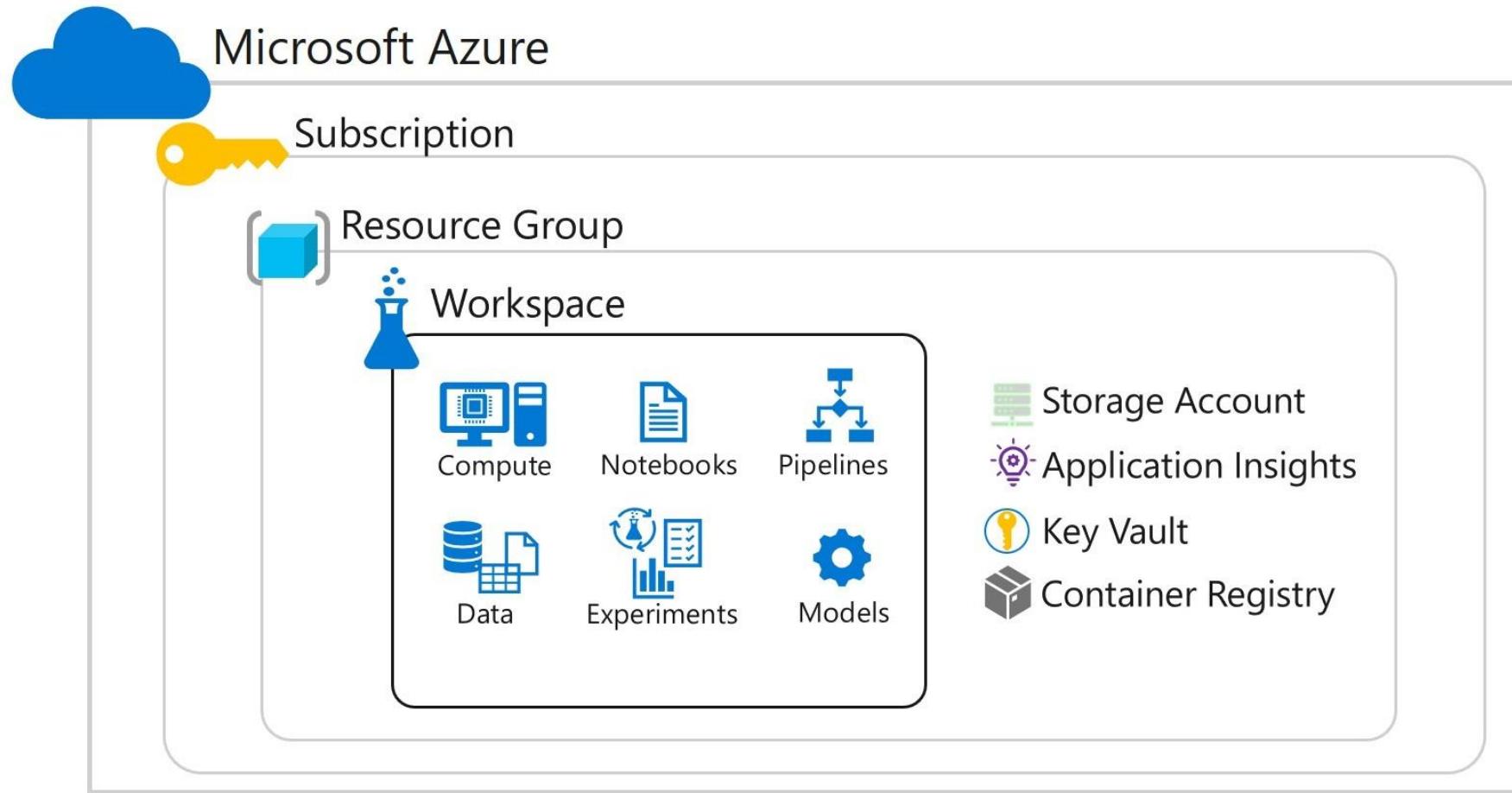
A workspace is a context for the experiments, data, compute targets, and other assets associated with a machine learning workload.

Workspaces for Machine Learning Assets

A workspace defines the boundary for a set of related machine learning assets. You can use workspaces to group machine learning assets based on projects, deployment environments (for example, test and production), teams, or some other organizing principle. The assets in a workspace include:

- Compute targets for development, training, and deployment.
- Data for experimentation and model training.
- Notebooks containing shared code and documentation.
- Experiments, including run history with logged metrics and outputs.
- Pipelines that define orchestrated multi-step processes.
- Models that you have trained.

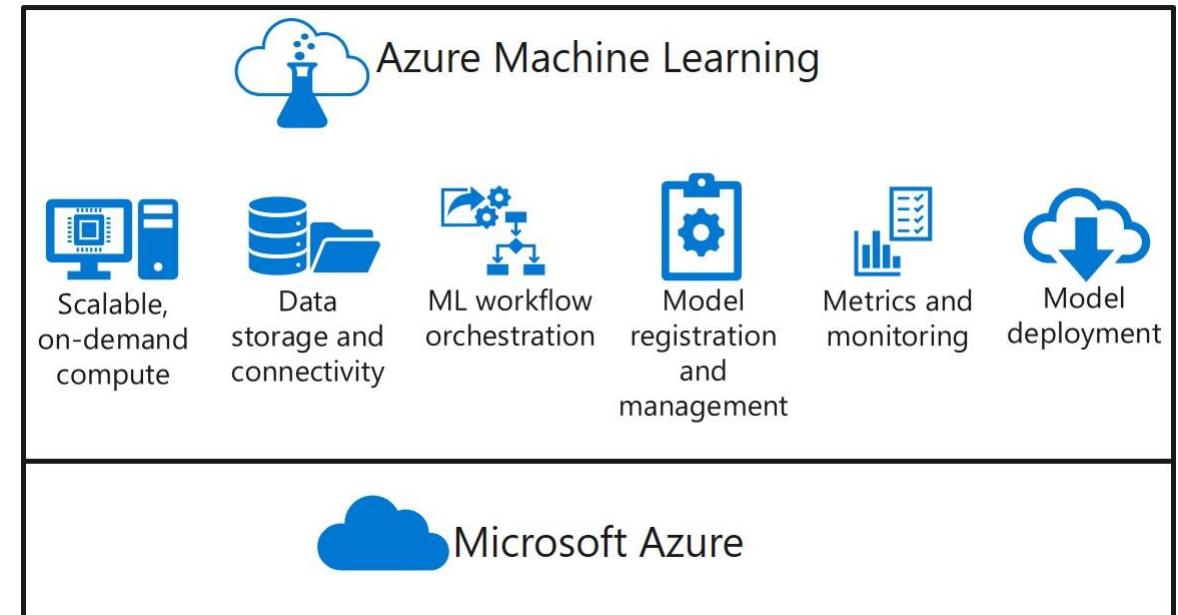
> Azure ML Workspaces



> Azure ML Studio

Built on the Microsoft Azure cloud platform, Azure Machine Learning enables you to manage:

- Scalable on-demand compute for machine learning workloads.
- Data storage and connectivity to ingest data from a wide range sources.
- Machine learning workflow orchestration to automate model training, deployment, and management processes.
- Model registration and management, so you can track multiple versions of models and the data on which they were trained.
- Metrics and monitoring for training experiments, datasets, and published services.
- Model deployment for real-time and batch inferencing.



> Azure ML Studio

The screenshot shows the Azure Machine Learning studio interface. The left sidebar includes sections for New, Home, Author, Notebooks, Automated ML, Designer, Assets (Datasets, Experiments, Pipelines, Models, Endpoints), Compute, Datastores, and Data labeling. The main area displays a welcome message, recent resources (Runs and Compute), and four main features: Create new, Notebooks, Automated ML, and Designer.

Welcome to the studio!

Create new

Notebooks
Code with Python SDK and run sample experiments.
Start now

Automated ML
Automatically train and tune a model using a target metric.
Start now

Designer
Drag-and-drop interface from prepping data to deploying models.
Start now

My recent resources

Runs

Run number	Experiment	Update...	Status
14	diabetes-training-pipeli...	Decem...	Compl...
1	Off33249-684d-4f43-a9...	Decem...	Compl...
2	df882a44-b69a-4530-8...	Decem...	Compl...
1	df882a44-b69a-4530-8...	Decem...	Compl...
1	5dddae9b-6dce-46a6-...	Decem...	Compl...

Compute

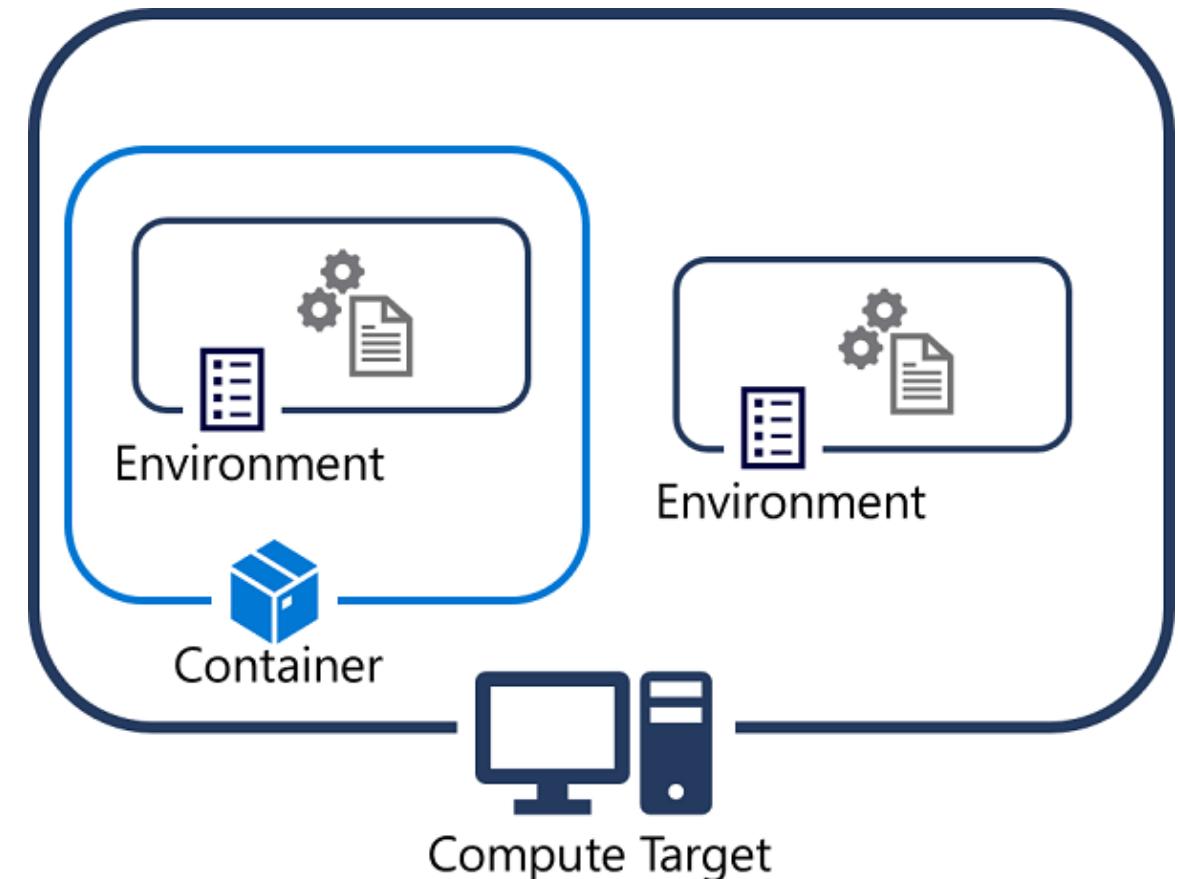
Name	Type	Provis...	Creat...
aml-cluster	Machine Learnin...	✓ Succes...	Dece...
aml-instance	Compute Instan...	✓ Succes...	Dece...

Azure Machine Learning studio
You can manage the assets in your Azure Machine Learning workspace in the Azure portal, but as this is a general interface for managing all kinds of resources in Azure, data scientists and other users involved in machine learning operations may prefer to use a more focused, dedicated interface.

> Azure ML Studio

Python code runs in the context of a *virtual environment* that defines the version of the Python runtime to be used as well as the installed packages available to the code. In most Python installations, packages are installed and managed in environments using **Conda** or **pip**.

To improve portability, we usually create environments in docker containers that are in turn be hosted in compute targets, such as your development computer, virtual machines, or clusters in the cloud.



Azure AI

Azure AI

Solution Areas

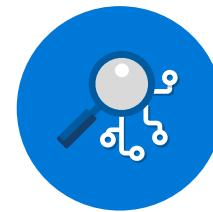
AI apps and agents



Azure Cognitive Services

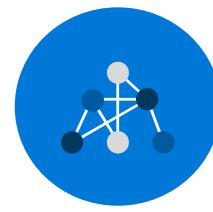
Azure Bot Service

Knowledge mining



Azure Search

Machine learning



Azure Databricks

Azure Machine Learning

Azure AI Infrastructure

Productive

Built for enterprises

Trusted

Machine Learning on Azure

Domain specific pretrained models

To simplify solution development



Vision



Speech



Language



Search

Familiar Data Science tools

To simplify model development



Visual Studio Code



Azure Notebooks



Jupyter



Command line

Popular frameworks

To build advanced deep learning solutions



PyTorch



TensorFlow



Scikit-Learn



ONNX

Productive services

To empower data science and development teams



Azure
Databricks



Azure
Machine
Learning



Machine
Learning VMs

Powerful infrastructure

To accelerate deep learning



CPU



GPU



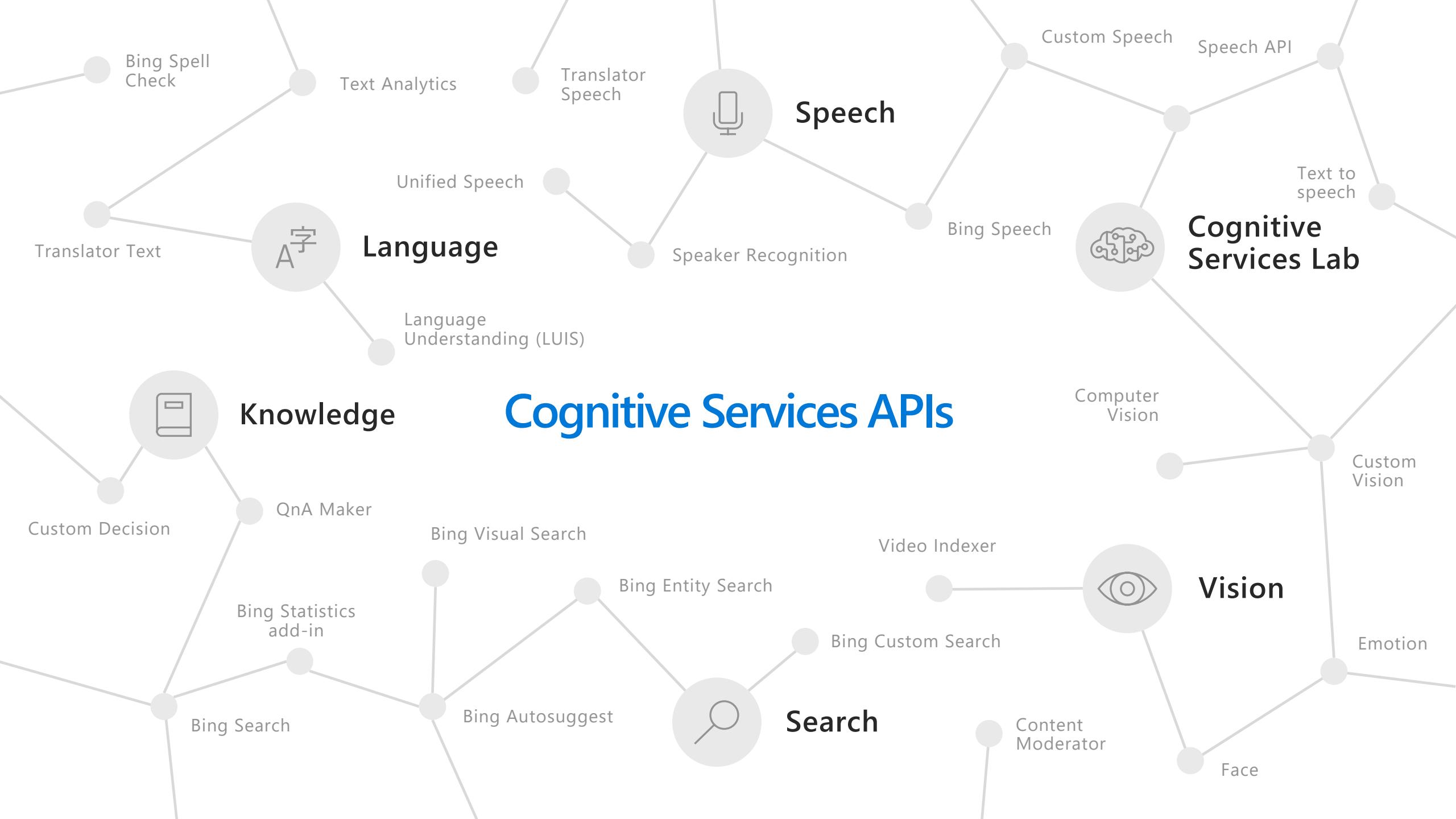
FPGA



From the Intelligent Cloud to the Intelligent Edge



Cognitive Services APIs



Cognitive Services capabilities

Infuse your apps, websites, and bots with human-like intelligence



Vision

- Object, scene, and activity detection
- Face recognition and identification
- Celebrity and landmark recognition
- Emotion recognition
- Text and handwriting recognition (OCR)
- Customizable image recognition
- Video metadata, audio, and keyframe extraction and analysis
- Explicit or offensive content moderation



Speech

- Speech transcription (speech-to-text)
- Custom speech models for unique vocabularies or complex environment
- Text-to-speech
- Custom Voice
- Real-time speech translation
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- Speaker identification and verification



Language

- Language detection
- Named entity recognition
- Key phrase extraction
- Text sentiment analysis
- Multilingual and contextual spell checking
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- PII detection for text moderation
- Text translation
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- Contextual language understanding



Knowledge

- Q&A extraction from unstructured text
- Knowledge base creation from collections of Q&As
- Semantic matching for knowledge bases
- Customizable content personalization learning



Search

- Ad-free web, news, image, and video search results
- Trends for video, news
- Image identification, classification and knowledge extraction
- Identification of similar images and products
- Named entity recognition and classification
- Knowledge acquisition for named entities
- Search query autosuggest
- Ad-free custom search engine creation

Knowledge mining with Azure Search

Documents



Key Phrase extraction



Organization entity extraction



Face detection



Custom skills



Cognitive skills



Location entity extraction



Persons entity extraction



Celebrity recognition



Landmark detection

Fully text-searchable rich index



Sentiment analysis



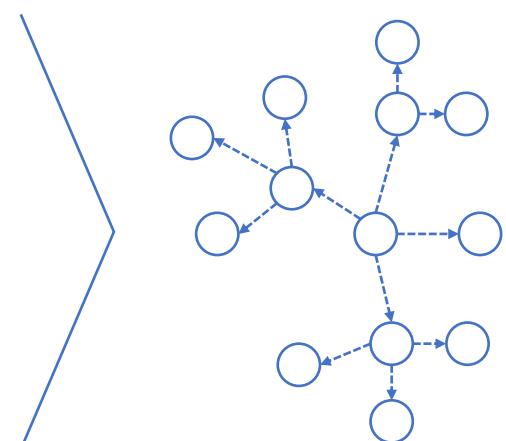
Language detection



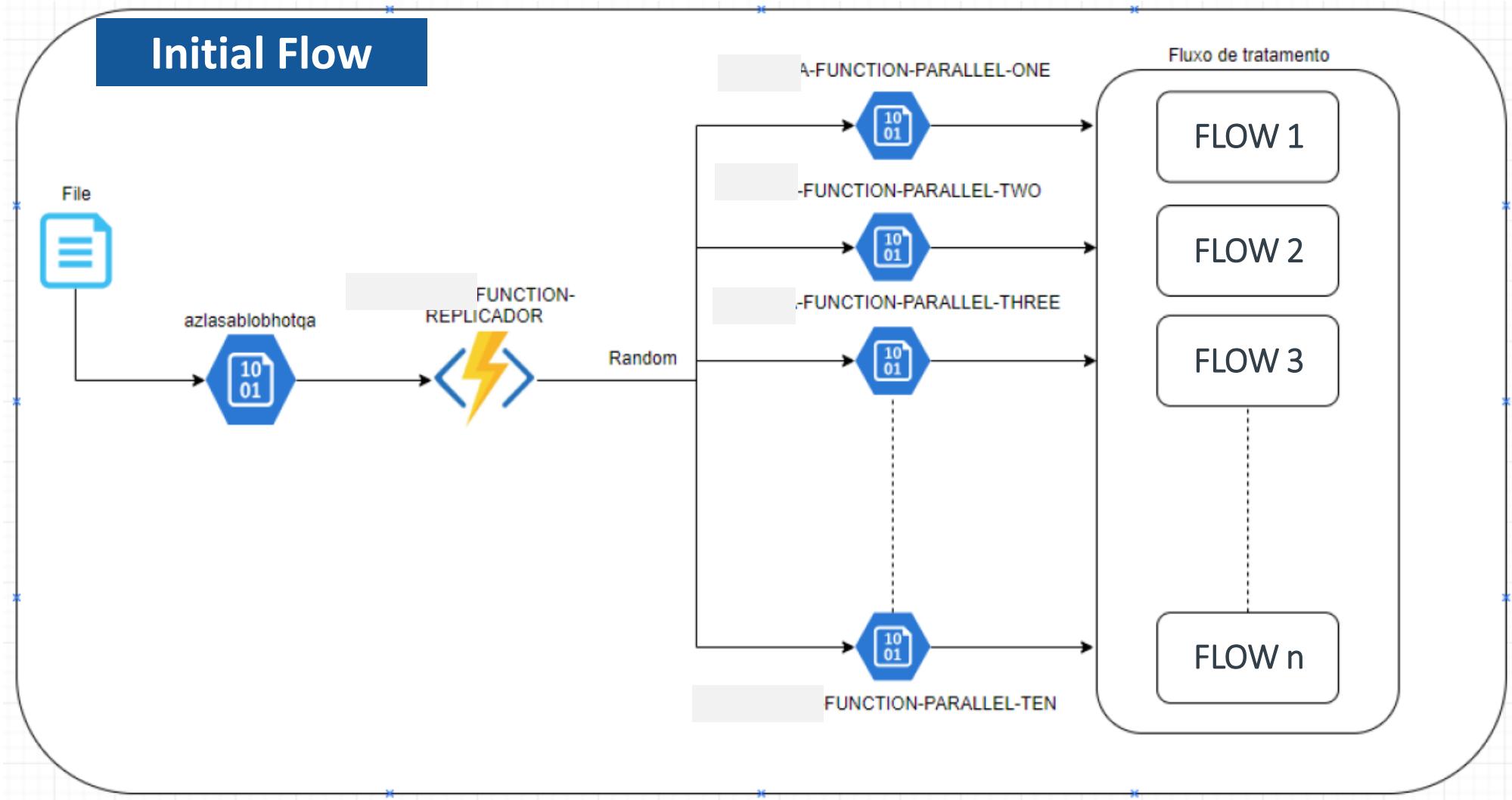
Tag extraction



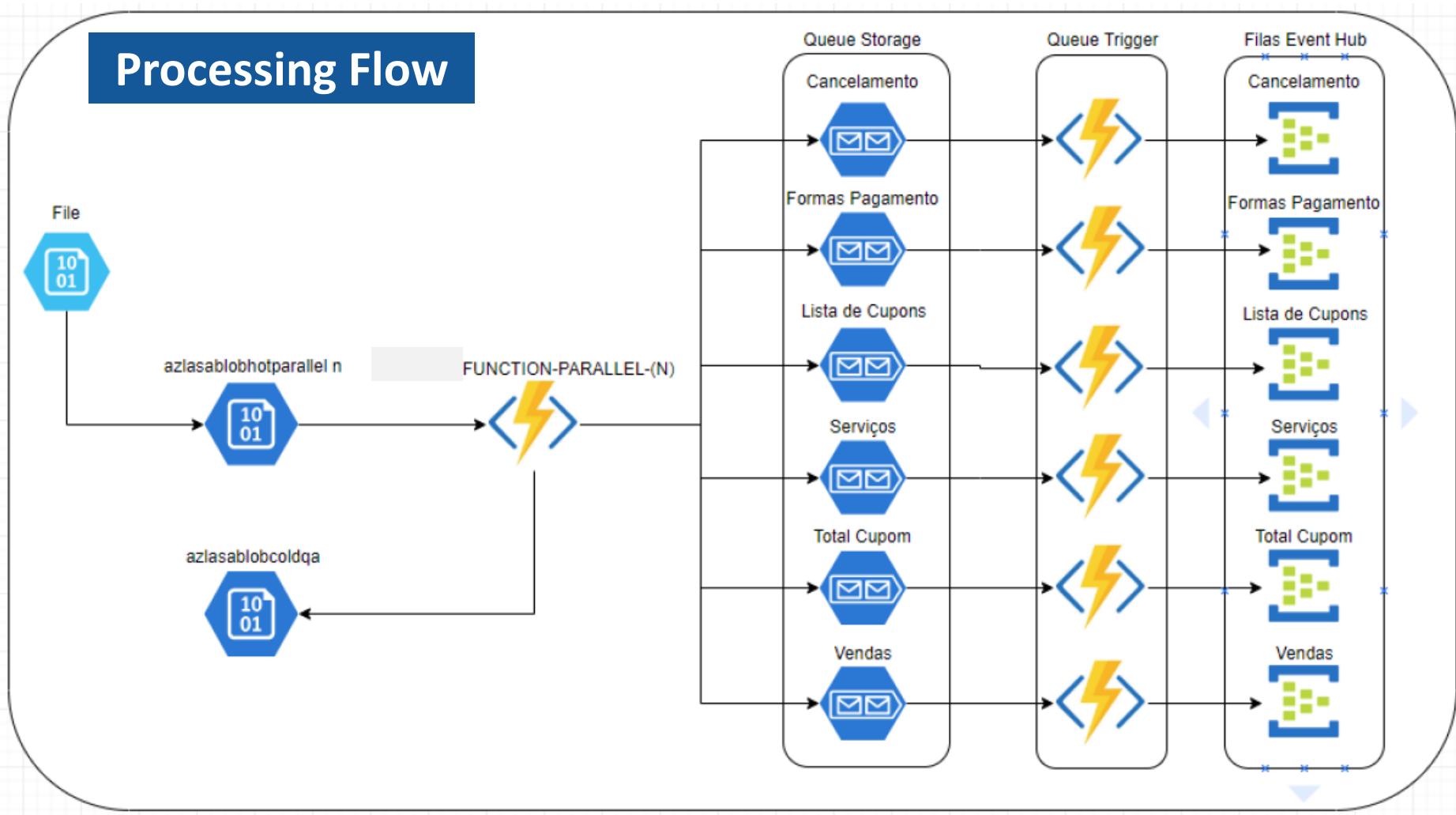
Printed text recognition



> Case // Example // Parallel processes



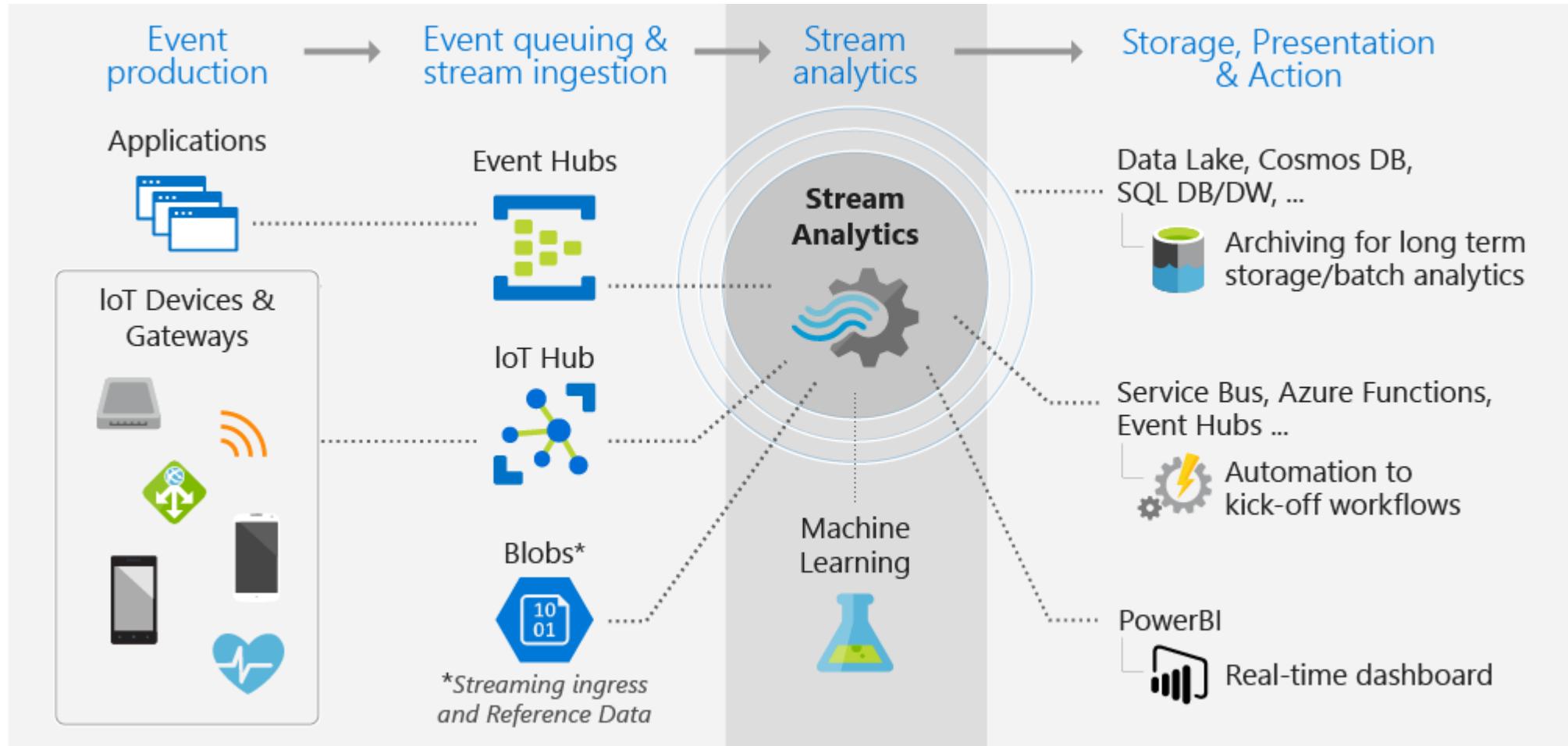
> Case // Example // Flow Detail



Stream Analytics

Stream Analytics

Event-processing engine that allows you to examine high volumes of data streaming from devices



> Draw your own architecture...

Microsoft Azure Cloud and AI Symbol / Icon Set - SVG

– Pointer

[Azure Icons - Azure Architecture Center | Microsoft](#)

[Docs](#)

[Terms](#)

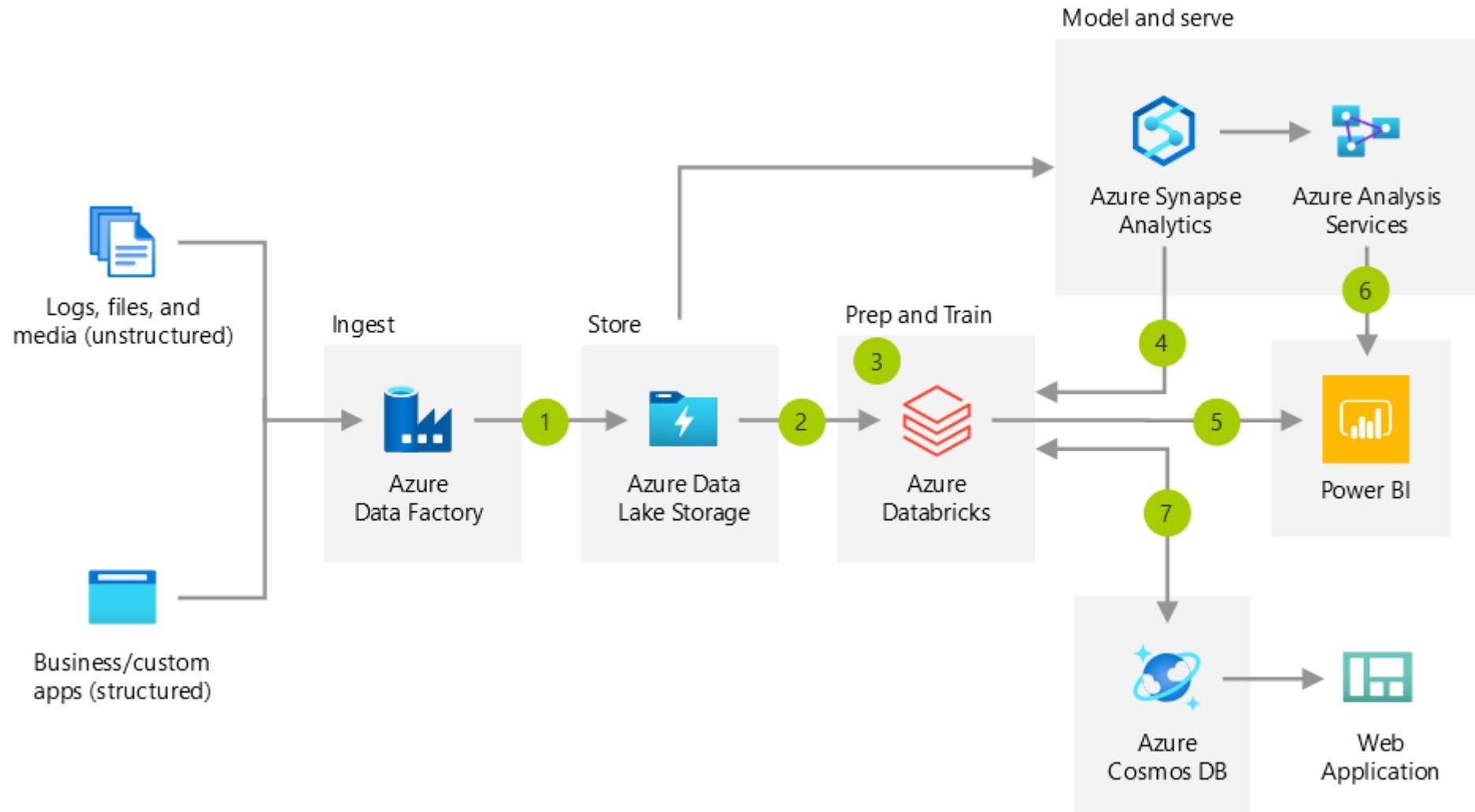
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I agree to the above terms

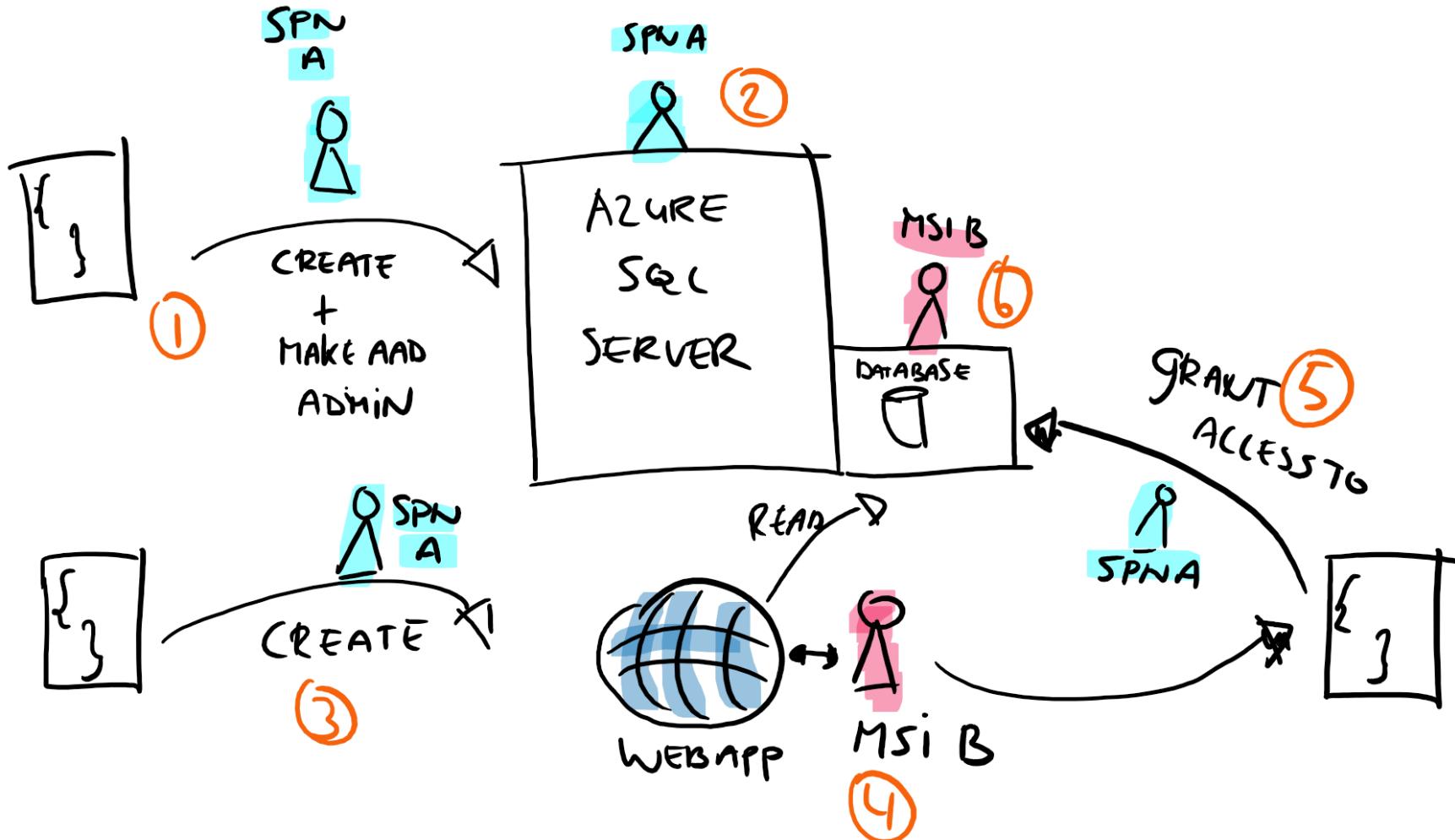
[Download SVG icons](#)



> Why should you use professional icons?



> Why should you use professional icons?



Assignment #3

Microsoft



> #3 Draw your own Architecture

INSTRUCTIONS:

Think about a possible architecture / business needs based on the case detailed in the next slide.

Consider all the data sources and steps to ingest data and to show the visualizations.

- Use PowerPoint or other drawing tool (draw.io)
- <https://app.diagrams.net/> | <https://www.diagrams.net/>
- Use the standard icons for each service available
- Explain why do you select the resource / Clarify your expectations

After you finish your Architecture , please explain why you selected each of the different services and make sure that you draw the arrows showing the data flow.

EVALUATION:

Mark: 5 points

Delivery: PPT OR Video 1-4 minutes (explanations)

Ensure that you recorded yourself explaining your data flow

Ensure that you showed all the performed steps

Data Sources / Data ingestion / Store / Process / Serve

Ensure to explain each resource and why you choose them

Will be considered:

Your results, level of detail and clarity to explain and video quality.

Due date: Week 9 class

> #3 Draw your own Architecture

SCOPE

The STK company is a brand-new start-up responsible to deliver 95% of all the products sold by Amazon in Canada. This company is using SAP, ORACLE, and Microsoft Dynamics 365 CRM, as the main data sources. The company also has some data stored in a blob storage service on Azure (CSV files and unstructured data).

The main idea is to move ALL the data to a cloud instance (Azure). They need a unique place to store all the data and to help them to explore the data, generating data analysis, and prep the structure for future AI projects.

SOME QUESTIONS

Your architecture should answer questions like:

- How to ingest the data from the different data sources?
- Where to store the data?
- What are the tools to perform data analysis?
- What are the resources you are planning to use for future AI projects?
- Where to process and train your data?
- What are the tools / resources to perform AI models?
- Where are you planning to generate the management data visualization? Dashboards?

References



> References

- Big Data Analytics Program, 2019/2020 – Georgian College, Barrie, Ontario
- Microsoft, Azure data platform, <https://docs.microsoft.com/en-us/azure/architecture/example-scenario/dataplate2e/data-platform-end-to-end>
- Microsoft, Data warehousing and analytics, <https://docs.microsoft.com/en-us/azure/architecture/example-scenario/data/data-warehouse>
- Microsoft, Advanced Analytics Architecture, <https://docs.microsoft.com/en-us/azure/architecture/solution-ideas/articles/advanced-analytics-on-big-data>
- Microsoft, Azure Synapse Analytics - dedicated SQL pool Videos, <https://docs.microsoft.com/en-us/azure/synapse-analytics/sql-data-warehouse/sql-data-warehouse-videos>
- Microsoft, Success by Design Implementation Guide, First Edition, 2021
- Monkey Learn, Sentiment Analysis, <https://monkeylearn.com/sentiment-analysis/>
- Cloud Geeks, Jerry Hargrove, website, <https://www.lucidchart.com/blog/what-are-cloud-regions>
- Microsoft, Authentication, Microsoft Docs, <https://docs.microsoft.com/en-us/learn/modules/recognize-dynamics-365-security/4-authentication>
- Microsoft, Dataverse, Microsoft Docs, <https://docs.microsoft.com/en-us/learn/modules/connect-analyze-dynamics-365-data/3-benefits-dataverse>
- Microsoft, Azure Data Platform End-to-End, Implement a Modern Data Platform Architecture, Official Material



Georgian

END OF DAY 7

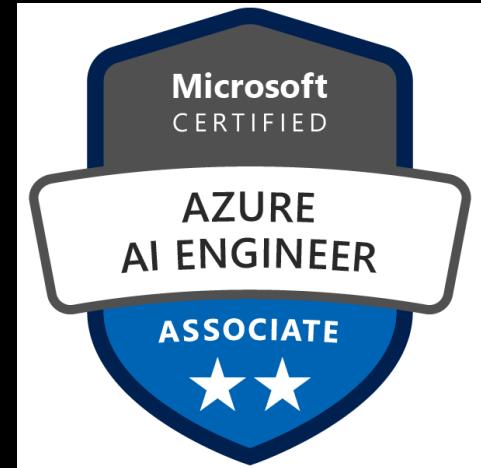
Challenge #4 // Part 1

Azure Cognitive Services

Intro + Quick Start

IN THIS CHALLENGE:

1. Intro
2. Azure Cognitive Services
3. Create Cognitive Services
4. Quick Start
5. Tools / IDE's



This content is based on the main requirements for AI-102 Certification



Exam AI-102: Designing and Implementing a Microsoft Azure AI Solution

Candidates for Exam AI-102 should have subject matter expertise building, managing, and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework.

Candidates for this exam should be proficient in C#, Python, or JavaScript and should be able to use REST-based APIs and SDKs to build computer vision, natural language processing, knowledge mining, and conversational AI solutions on Azure. They should also understand the components that make up the Azure AI portfolio and the available data storage options. Plus, candidates need to understand and be able to apply responsible AI principles.

YOU CAN DO IT

“If you find something very difficult to achieve yourself, don’t imagine it impossible—for anything possible and proper for another person can be achieved as easily by you.”

—MARCUS AURELIUS, *MEDITATIONS*, 6.19

There are two kinds of people in this world. The first looks at others who have accomplished things and thinks: *Why them? Why not me?* The other looks at those same people and thinks: *If they can do it, why can't I?*

One is zero-sum and jealous (if you win, I lose). The other is non-zero-sum (there's plenty to go around) and sees the success of others as an *inspiration*. Which attitude will propel you onward and upward? Which will drive you to bitterness and despair?

Who will you be?

Before we start there are some important clarification points:

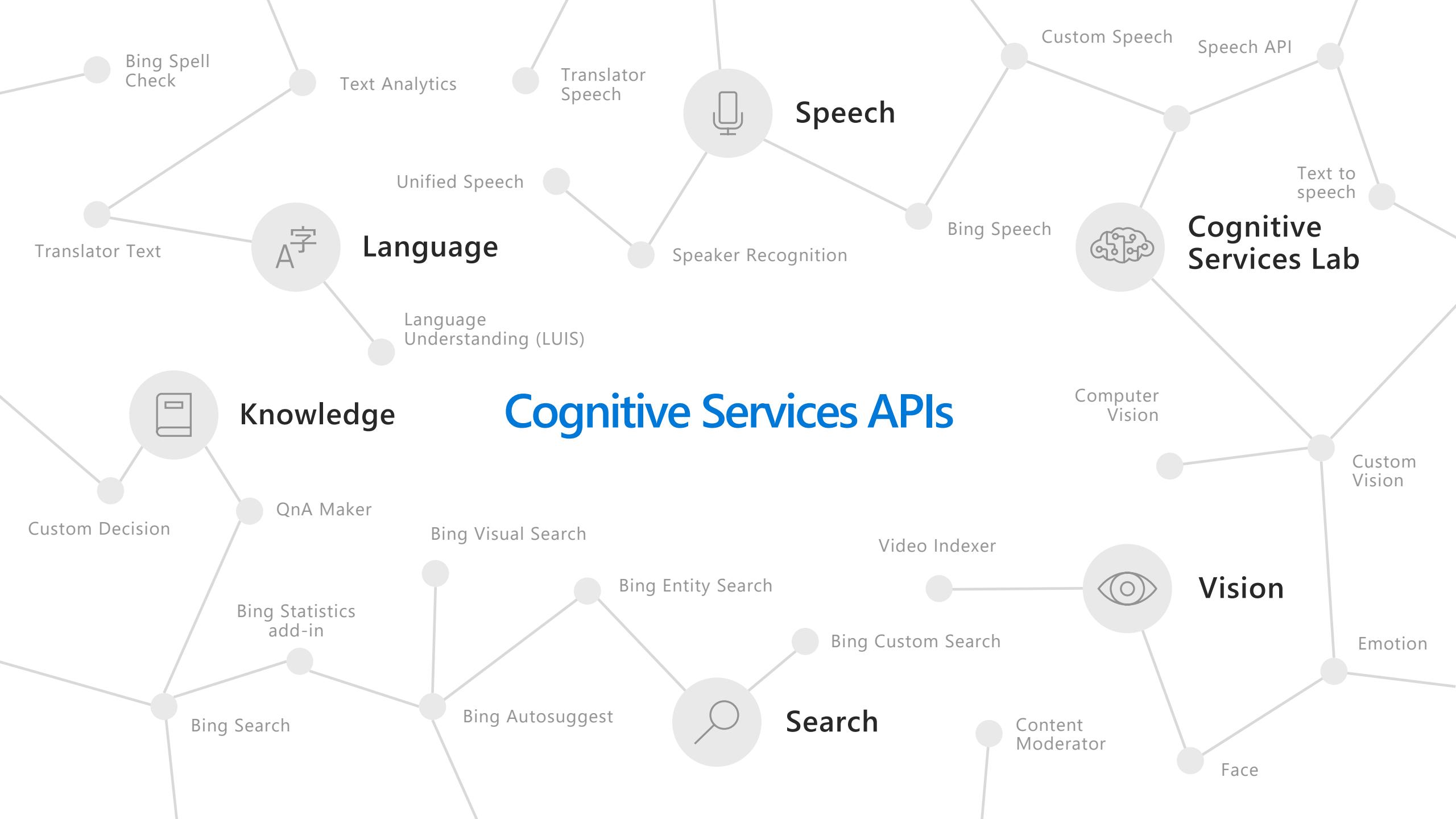


- (1) Troubleshooting is REALLY important** – It is important for you to find the bugs in your code, env, IDE, etc.
- (2) The code IS JUST a code** – There are several ways to write a code and different languages. The examples here are just one way to do it.
- (3) This IS NOT a prep course** – The main goal here is to show the practical application of the Azure Resources with a focus on Enterprise AI solutions.
- (4) You won't be graded by the challenges** but, they are an important practical component in your learning experience.

Challenge #4.1

Intro to Azure Cognitive Services

Cognitive Services APIs



Cognitive Services capabilities

Infuse your apps, websites, and bots with human-like intelligence



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- Named entity recognition and classification
- Knowledge acquisition for named entities
- Search query autosuggest
- Ad-free custom search engine creation

Azure Cognitive Services document +

docs.microsoft.com/en-us/azure/cognitive-services/ ☆

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Portal Free account

Azure Cognitive Services documentation

Learn how to build intelligent and supported algorithms into apps, websites, and bots to see, hear, speak, understand, and interpret your user needs.



OVERVIEW
[What are Cognitive Services?](#)



WHAT'S NEW
[What's new in docs?](#)



CONCEPT
[Development options](#)



CONCEPT
[Cognitive Services and machine learning](#)



CONCEPT
[Cognitive Services on-prem containers](#)



CONCEPT
[Cognitive Services with databases](#)



REFERENCE
[Language support](#)



REFERENCE
[Support and help options](#)

Vision

Recognize, identify, caption, index, and

Language

Allow your apps to process natural

Speech

Convert speech into text and text into

Decision

Build apps that surface recommendations

Vision

Recognize, identify, caption, index, and moderate your pictures, videos, and digital ink content.

[Computer Vision](#)

[Custom Vision](#)

[Face](#)

Language

Allow your apps to process natural language with pre-built scripts, evaluate sentiment and learn how to recognize what users want.

[Language Understanding \(LUIS\)](#)

[QnA Maker](#)

[Text Analytics](#)

[Translator](#)

Speech

Convert speech into text and text into natural-sounding speech. Translate from one language to another and enable speaker verification and recognition.

[Speech service](#)

[Customize with Speech Studio](#)

Decision

Build apps that surface recommendations for informed and efficient decision-making.

[Anomaly Detector](#)

[Content Moderator](#)

[Personalizer](#)

Search

Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news with a single API call.

[Bing Search APIs hub page](#)

Cognitive Service Containers

Container support in Azure Cognitive Services allows developers to use the same rich APIs that are available in Azure, and enables flexibility in where to deploy and host the services that come with Docker containers.

[Cognitive Services containers documentation](#)

[What are Cognitive Service containers?](#)

[Create containers for reuse](#)

[Deploy and run container on Azure Container Instance](#)

[Deploy to Azure Kubernetes Service](#)

[Use Docker Compose to deploy multiple containers](#)

[Cognitive Services containers FAQ](#)

Cognitive Services for Big Data

The Cognitive Services for Big Data allows developers to use cognitive services within databases to apply intelligent algorithms over large datasets

[Cognitive Services for Big Data](#)

[Use Cognitive Services within Azure Databricks and Azure Synapse Analytics](#)

[Python Samples](#)

Responsible use of AI

Azure Cognitive Services provides information and guidelines on how to responsibly use our AI services in your applications.

[Responsible use of AI](#)

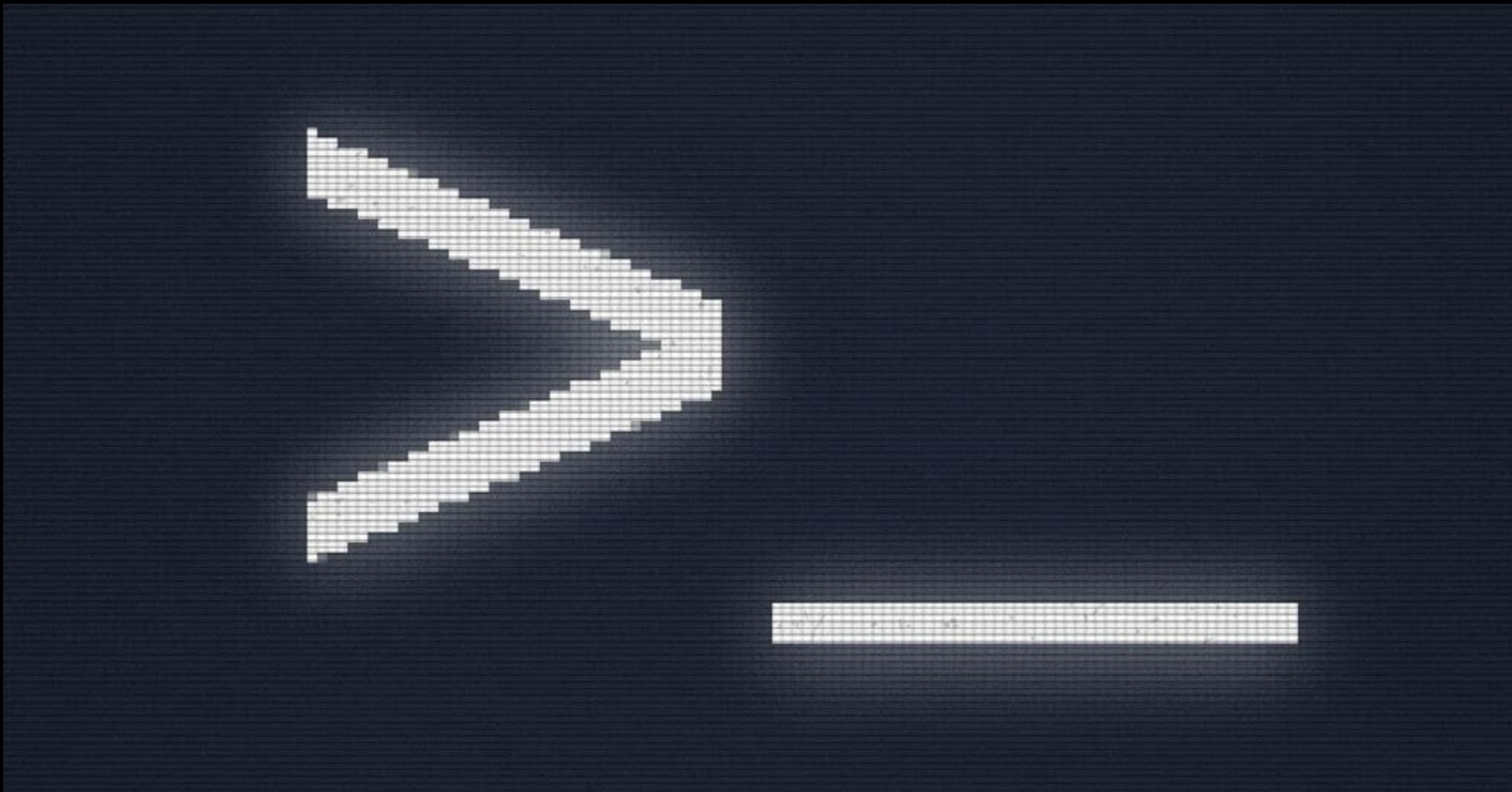


AZURE COGNITIVE SERVICE – Create Cognitive Service on Azure Portal

Categories of Cognitive Services

- CLI
- PowerShell
- Portal

```
New-AzCognitiveServicesAccount -ResourceGroupName cognitive-  
services-resource-group -name myluis -Type LUIS -SkuName S0 -Locatio  
n 'WestUS'
```



Install the Azure CLI for Windows +

docs.microsoft.com/en-us/cli/azure/install-azure-cli-windows?tabs=azure-cli

Microsoft | Docs Documentation Learn Q&A Code Samples

Search

Azure / Azure CLI

Save Feedback Edit Share

Filter by title

Azure CLI

> Overview

✓ Install, update and run

 ✓ Install

 Install

 Install - Windows (selected)

 Install - macOS

 Install - Linux

 Install - beta

Update

Run Azure CLI in a Docker container

Run Azure Cloud Shell using Bash

Sign in

> Tutorials

> Samples

> How-to guides

> Reference Summaries

> Reference

Install Azure CLI on Windows

09/25/2020 • 4 minutes to read •  +5

For Windows, the Azure CLI is installed via a MSI, which gives you access to the CLI through the Windows Command Prompt (CMD) or PowerShell. When installing for Windows Subsystem for Linux (WSL), packages are available for your Linux distribution. See the [main install page](#) for the list of supported package managers or how to install manually under WSL.

The current version of the Azure CLI is 2.24.2. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az version`.

Install or update

The MSI distributable is used for installing or updating the Azure CLI on Windows. You don't need to uninstall current versions before using the MSI installer because the MSI will update any existing version.

Microsoft Installer (MSI) Microsoft Installer (MSI) with Command

When the installer asks if it can make changes to your computer, click the "Yes" box.

Azure CLI current version

Download and install the current release of the Azure CLI. After the installation is complete, you will need to

Is this page helpful?

Yes No

In this article

| Install or update

Run the Azure CLI

Troubleshooting

Uninstall

Next Steps

<https://docs.microsoft.com/en-us/cli/azure/install-azure-cli-windows?tabs=azure-cli>

Overview of the Azure CLI | Micro  +     

docs.microsoft.com/en-us/cli/azure/   

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Azure CLI

- > Overview
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Azure Command-Line Interface (CLI) documentation

The Azure command-line interface (Azure CLI) is a set of commands used to create and manage Azure resources. The Azure CLI is available across Azure services and is designed to get you working quickly with Azure, with an emphasis on automation.

Install the Azure CLI

 [DOWNLOAD](#)

[Installation overview](#)
[Install for Windows](#)
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[Install on Linux](#)
[Run in Docker](#)
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Learn Azure CLI features

 [GET STARTED](#)

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[Create a service principal](#)
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Use the Azure CLI to manage cloud resources

 [QUICKSTART](#)

[Deploy a web application from GitHub](#)
[Create a Postgres SQL database](#)
[Create a Kubernetes cluster](#)

 [LEARN](#)

[Manage virtual machines with the Azure CLI](#)
[Control Azure services with the CLI](#)
[Connect an application to Azure Storage](#)

Azure CLI extensions

 [OVERVIEW](#)

Azure CLI reference

Command Prompt

Microsoft Windows [Version 10.0.19041.985]
(c) Microsoft Corporation. All rights reserved.

```
C:\Users\cailog>az login
The default web browser has been opened at https://login.microsoftonline.com/common/oauth2/authorize. Please continue the login in the web browser. If no web browser is available or if the web browser fails to open, use device code flow with `az login --use-device-code`.
You have logged in. Now let us find all the subscriptions to which you have access...
The following tenants don't contain accessible subscriptions. Use 'az login --allow-no-subscriptions' to have tenant level access.
06e469d1-2d2a-468f-ae9b-7df0968eb6d7 'OCAD University'
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "362067a6-2936-460f-ae05-bf263cebe940",
    "id": "bf350b48-f641-49a2-b7e4-598ce72df8ab",
    "isDefault": true,
    "managedByTenants": [],
    "name": "Free Trial",
    "state": "Enabled",
    "tenantId": "362067a6-2936-460f-ae05-bf263cebe940",
    "user": {
      "name": "caiogasparine@gmail.com",
      "type": "user"
    }
  }
]
```

C:\Users\cailog>

Command Prompt

Microsoft Windows [Version 10.0.19041.985]
(c) Microsoft Corporation. All rights reserved.

```
C:\Users\cailog>az cognitiveservices account list-kinds  
[
```

```
    "AnomalyDetector",  
    "Bing.CustomSearch",  
    "Bing.Search.v7",  
    "CognitiveServices",  
    "ComputerVision",  
    "ContentModerator",  
    "CustomVision.Prediction",  
    "CustomVision.Training",  
    "Face",  
    "FormRecognizer",  
    "ImmersiveReader",  
    "Internal.AllInOne",  
    "LUIS",  
    "LUIS.Authoring",  
    "MetricsAdvisor",  
    "Personalizer",  
    "QnAMaker",  
    "QnAMaker.v2",  
    "SpeechServices",  
    "TextAnalytics",  
    "TextTranslation"
```

```
]
```

```
C:\Users\cailog>
```

COMMAND: az cognitiveservices account list-kinds

Command Prompt

```
C:\Users\cailog>az group create --location westus --resource-group MyNewResourceGroup
{
  "id": "/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/MyNewResourceGroup",
  "location": "westus",
  "managedBy": null,
  "name": "MyNewResourceGroup",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
C:\Users\cailog>
```

COMMAND: az group create --location westus --resource-group **MyNewResourceGroup**

Command Prompt

```
C:\Users\cailog>az cognitiveservices account create -n myresource -g MyNewResourceGroup --kind Face --sku S0 -l WestEurope --yes
Notice
I certify that use of this service is not by or for a police department in the United States.
{
  "etag": "\"0100721d-0000-0d00-0000-60c261690000\"",
  "id": "/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/MyNewResourceGroup/providers/Microsoft.CognitiveServices/accounts/myresource",
  "identity": null,
  "kind": "Face",
  "location": "WestEurope",
  "name": "myresource",
  "properties": {
    "apiProperties": null,
    "capabilities": [
      {
        "name": "VirtualNetworks",
        "value": null
      },
      {
        "name": "Container",
        "value": "Face.Face"
      }
    ],
    "customSubDomainName": null,
    "dateCreated": "2021-06-10T19:00:57.1021234Z",
    "encryption": null,
    "endpoint": "https://westeurope.api.cognitive.microsoft.com/",
    "internalId": "b27d2d1274d04836982f9a1035700381",
  }
}
```

COMMAND: az cognitiveservices account create -n myresource -g MyNewResourceGroup --kind Face --sku S0 -l WestEurope --yes

Command Prompt

```
C:\Users\cailog>az cognitiveservices account delete --name myresource --resource-group myNewResourceGroup
```

```
C:\Users\cailog>
```

COMMAND: az cognitiveservices account delete --name **myresource** --resource-group **myNewResourceGroup**

Count Parameter (*preview*)

For example: `az vm create.... --count 2`

With this command Azure will deploy 2 VM instances in parallel (or the number used in the parameter count)
Azure engine will manage VNET, disks, public IP's, NSG, and etc.

Another simple example for academic purposes: Create 2 VMs using Debian without customization

`az group create -n rg-example -l eastus`

`az vm create -n vm-example -g rg-example --count 2 --size Standard_B1ls --image Debian --generate-ssh-keys`

The first line will create the resource group (example)

The second line will create the resources inside the resource group.

All resources - Microsoft Azure x +

portal.azure.com/#blade/HubsExtension/BrowseAll

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > All resources

Create Manage view Refresh Export to CSV Open query Feedback Assign tags Delete

Filter for any field... Subscription == all Resource group == all Type == all Location == all Add filter

Showing 1 to 20 of 20 records. Show hidden types

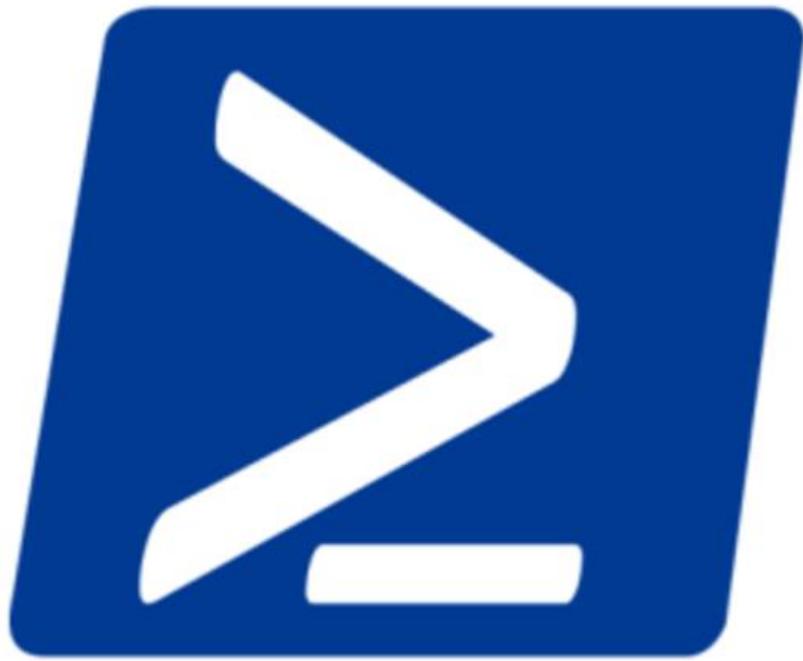
No grouping List view

Name	Type	Resource group	Location	Subscription
storageaccountcaio	Storage account	rg-caio-ai	East US	Free Trial
translator-caio	Cognitive Services	rg-caio-ai	East US	Free Trial
vm-example0	Virtual machine	rg-example	East US	Free Trial
vm-example0_OsDisk_1_15a314090c274451bad00f8f719403fc	Disk	RG-EXAMPLE	East US	Free Trial
vm-example1	Virtual machine	rg-example	East US	Free Trial
vm-example1_OsDisk_1_25a2ab7a0e1d425b91b1e3137f0d4127	Disk	RG-EXAMPLE	East US	Free Trial
vm-exampleNSG	Network security group	rg-example	East US	Free Trial
vm-examplePublicIP0	Public IP address	rg-example	East US	Free Trial
vm-examplePublicIP1	Public IP address	rg-example	East US	Free Trial
vm-exampleVMNic0	Network interface	rg-example	East US	Free Trial
vm-exampleVMNic1	Network interface	rg-example	East US	Free Trial
vm-exampleVNET	Virtual network	rg-example	East US	Free Trial

< Previous Page 1 of 1 Next >

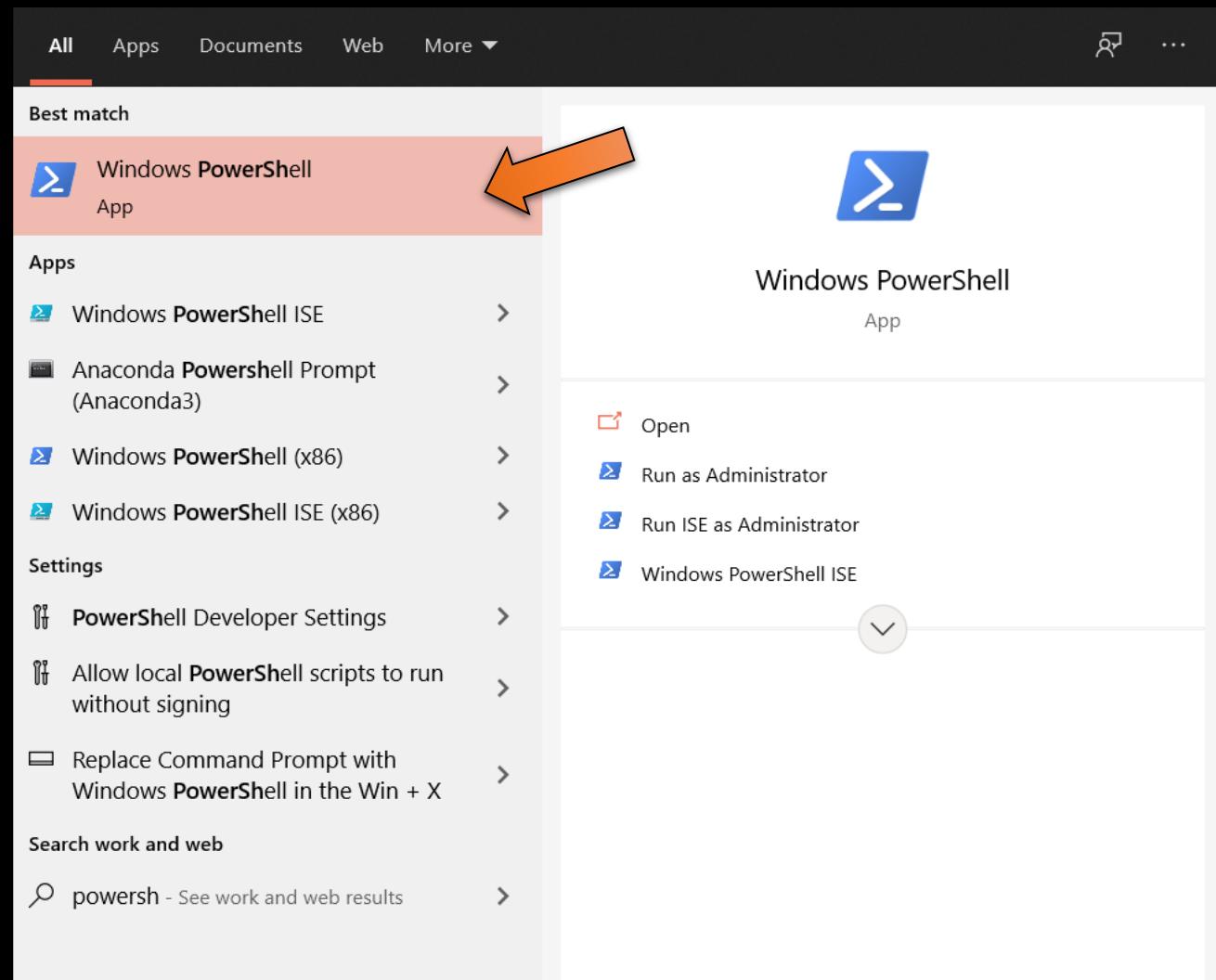
Result

The screenshot shows the Microsoft Azure 'All resources' blade. A red rectangular selection box highlights the first 10 resources in the list. An orange arrow points from the top right towards the highlighted area. The resources listed are: storageaccountcaio, translator-caio, vm-example0, vm-example0_OsDisk_1_15a314090c274451bad00f8f719403fc, vm-example1, vm-example1_OsDisk_1_25a2ab7a0e1d425b91b1e3137f0d4127, vm-exampleNSG, vm-examplePublicIP0, vm-examplePublicIP1, vm-exampleVMNic0, vm-exampleVMNic1, and vm-exampleVNET. The 'Type' column includes Storage account, Cognitive Services, Virtual machine, Disk, Network security group, Public IP address, Network interface, and Virtual network. The 'Resource group' column lists rg-caio-ai, rg-example, and rg-example. The 'Location' column shows East US for all resources. The 'Subscription' column indicates Free Trial for all resources.



PowerShell

Microsoft Azure



Windows PowerShell

App

Open

Run as Administrator

Run ISE as Administrator

Windows PowerShell ISE



C:\Users\cailog

Windows PowerShell
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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

Loading personal and system profiles took 874ms.
cailog@DESKTOP-9Q74A52 ~ [15:10]

[]

Get started with Azure PowerShell x +

docs.microsoft.com/en-us/powershell/azure/get-started-azureps?view=azps-6.0.0

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Az PowerShell 6.0.0

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> Migrate from AzureRM

Get started

Cloud Shell

> Sign in

Queries

Format output

Manage subscriptions

> Deploy

> Concepts

> Tutorials

> Sample Scripts

> Release notes

Get started with Azure PowerShell

04/24/2020 • 3 minutes to read • 

Azure PowerShell is designed for managing and administering Azure resources from the command line. Use Azure PowerShell when you want to build automated tools that use the Azure Resource Manager model. Try it out in your browser with [Azure Cloud Shell](#), or install on your local machine.

This article helps you get started with Azure PowerShell and teaches the core concepts behind it.

Install or run in Azure Cloud Shell

The easiest way to get started with Azure PowerShell is by trying it out in an Azure Cloud Shell environment. To get up and running with Cloud Shell, see [Quickstart for PowerShell in Azure Cloud Shell](#). Cloud Shell runs PowerShell on a Linux container, so Windows-specific functionality isn't available.

When you're ready to install Azure PowerShell on your local machine, follow the instructions in [Install the Azure PowerShell module](#).

Sign in to Azure

Sign in interactively with the `Connect-AzAccount` cmdlet. Skip this step if you use Cloud Shell. Your Azure Cloud Shell session is already authenticated for the environment, subscription, and tenant that launched the Cloud Shell session.

Is this page helpful?

Yes No

In this article

Install or run in Azure Cloud Shell

Sign in to Azure

Find commands

Telemetry

Learn Azure PowerShell basics with quickstarts and tutorials

Next steps

Overview of Azure PowerShell | [M](#) [x](#) + ☰ - □ X

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[Az PowerShell 6.0.0](#) Filter by title
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- > Sample Scripts
- > Release notes

Azure PowerShell documentation

Azure PowerShell is a set of cmdlets for managing Azure resources directly from the PowerShell command line. Azure PowerShell is designed to make it easy to learn and get started with, but provides powerful features for automation. Written in .NET Standard, Azure PowerShell works with PowerShell 5.1 on Windows, PowerShell 7.0.6 LTS and PowerShell 7.1.3 or higher on all platforms.

Get started with Azure PowerShell

-  [DOWNLOAD](#)
 - [Install Azure PowerShell](#)
 - [Install PowerShell](#)
 - [Run in Azure Cloud Shell](#)
-  [GET STARTED](#)
 - [Get started](#)
 - [Learn about PowerShell concepts](#)
-  [HOW-TO GUIDE](#)
 - [Authenticate with Azure PowerShell](#)

Manage Azure resources

-  [CONCEPT](#)
 - [Sample scripts for virtual machines](#)
 - [Sample scripts for Azure App Service](#)
 - [Sample scripts for SQL databases](#)
-  [TUTORIAL](#)
 - [Create virtual machines on the same subnet](#)
-  [LEARN](#)
 - [Automate Azure tasks from PowerShell](#)

Migrate from AzureRM

-  [OVERVIEW](#)
 - [About the Azure PowerShell 'Az' module](#)
-  [CONCEPT](#)
 - [Migrate from AzureRM to Az](#)
-  [REFERENCE](#)
 - [Breaking changes between AzureRM and Az](#)

<https://docs.microsoft.com/en-us/powershell/azure/?view=azps-6.0.0>



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portal.azure.com/#home ★

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Azure services

Create a resource Cost Management ... Subscriptions All resources Data factories SQL databases Quickstart Center Virtual machines App Services

R\$959.71 credit remaining
Subscription 'Free Trial' has a remaining credit of R\$959.71.
[Click here to upgrade to a Pay-As-You-Go subscription.](#)

Recent resources

Name	Type	Last Viewed
cognitiveservices-caio	Cognitive Services	an hour ago
rg-caio-ai	Resource group	an hour ago
storageaccountcaio	Storage account	a week ago
Free Trial	Subscription	a week ago
sql-caio-ai1	SQL database	a week ago
sa-caio-ai1	Synapse workspace	2 weeks ago
df-caio-001	Data factory (V2)	3 weeks ago

Navigate

Subscriptions Resource groups All resources Dashboard

Azure Portal

Why you should consider
using **CLI or PowerShell?**

Other VERY important key things...

- **Subscription**
- **Resource Group**
- **Region**
- **Resource Name**
- **Pricing Tier**

- **REGIONAL AVAILABILITY**

The API's in Cognitive Services are hosted on a growing network of Microsoft-managed datacenters. You can find the regional availability for each API in Azure Region List.

<https://azure.microsoft.com/en-us/global-infrastructure/geographies/>

- **SECURITY**

Azure Cognitive Services provides a layered security model, including authentication, via Azure Active Directory credentials, a valid resource key, and Azure Virtual Networks.

Challenge #4.2

Azure Cognitive Services



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Azure Cognitive Services

A comprehensive family of AI services and cognitive APIs to help you build intelligent apps

Try Cognitive Services free



Product overview

Features

APIs

Customer stories

Documentation

FAQ

What is Azure Cognitive Services?

Cognitive Services brings AI within reach of every developer—without



Chat with Sales

Cognitive Services—APIs for AI D X +

← → ⌂ ⌄ 🔒 azure.microsoft.com/en-us/services/cognitive-services/#api ☆

Microsoft Azure | ▾

Product overview Features APIs Customer stories Documentation FAQs Free account

Azure Cognitive Services

Decision	Make smarter decisions faster
Language	Anomaly Detector Identify potential problems early on.
Speech	Content Moderator Detect potentially offensive or unwanted content.
Vision	Personalizer Create rich, personalized experiences for every user.

Explore the whole family of Azure AI services

Chat with Sales

Cognitive Services—APIs for AI D X +

azure.microsoft.com/en-us/services/cognitive-services/#api

Microsoft Azure | ▾

Product overview Features APIs Customer stories Documentation FAQs Free account

Azure Cognitive Services

Decision

Language

Speech

Vision

Extract meaning from unstructured text

Language Understanding

Build natural language understanding into apps, bots, and IoT devices.

QnA Maker

Create a conversational question and answer layer over your data.

Text Analytics

Detect sentiment, key phrases, and named entities.

Translator

Detect and translate more than 90 supported languages.

LUIS

Azure BOT

Translator API

Chat with Sales

The screenshot shows the Microsoft Azure Cognitive Services page. On the left, there's a sidebar with categories: Decision, Language (which is highlighted with a red border), Speech, and Vision. The main content area has a heading 'Extract meaning from unstructured text' followed by four service cards. The first card is 'Language Understanding' (red border), which says 'Build natural language understanding into apps, bots, and IoT devices.' The second card is 'QnA Maker' (red border), which says 'Create a conversational question and answer layer over your data.' The third card is 'Text Analytics', which says 'Detect sentiment, key phrases, and named entities.' The fourth card is 'Translator' (red border), which says 'Detect and translate more than 90 supported languages.' To the right of each service card is a blue button with the service name: LUIS, Azure BOT, and Translator API respectively. At the bottom right is a 'Chat with Sales' button. The URL in the address bar is https://azure.microsoft.com/en-us/services/cognitive-services/.

Cognitive Services—APIs for AI D X +

← → ⌂ ⌄ 🔒 azure.microsoft.com/en-us/services/cognitive-services/#api ☆

Microsoft Azure | ▾

Product overview Features APIs Customer stories Documentation FAQs Free account

Azure Cognitive Services

Decision	Improve customer experiences with Speech
Language	Speech to Text Transcribe audible speech into readable, searchable text.
Speech	Text to Speech Convert text to lifelike speech for more natural interfaces.
Vision	Speech Translation Integrate real-time speech translation into your apps.
	Speaker Recognition PREVIEW Identify and verify the people speaking based on audio.

Chat with Sales

<https://azure.microsoft.com/en-us/services/cognitive-services/>

Cognitive Services—APIs for AI D X +

← → C ⌂ 🔒 azure.microsoft.com/en-us/services/cognitive-services/#api ⌂ ☆

Microsoft Azure | ▾

Product overview Features APIs Customer stories Documentation FAQs Free account

Azure Cognitive Services

Decision

Language

Speech

Vision

Identify and analyze content within images and videos

Computer Vision

Analyze content in images and video.

Custom Vision

Customize image recognition to fit your business needs.

Face

Detect and identify people and emotions in images.

OCR

Face API

Explore the whole family of Azure AI services

Chat with Sales

<https://azure.microsoft.com/en-us/services/cognitive-services/>



AZURE COGNITIVE SERVICE?

Microsoft Cognitive Services

Infuse intelligence into your applications



Vision

Computer Vision

Custom Vision Service

Content Moderator

Emotion API

Face API

Video Indexer



Speech

Bing Speech Service

Custom Speech Service

Speaker Recognition

Translator Speech



Language

Bing Spell Check

Language Understanding Intelligent Service (LUIS)

Linguistics Analysis

Text Analytics

Translator Text

Web Language Model



Knowledge

Custom Decision Service

QnA Maker

Knowledge Exploration

Entity Linking

Academic Knowledge

Bing Web Search

Bing Custom Search

Bing Autosuggest

Bing News Search

Bing Video Search

Bing Entity Search

Bing Image Search



Search

Challenge #4.3

Creating your Azure Cognitive Services

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Create a resource Cost Management ... Subscriptions All resources Data factories SQL databases Quickstart Center Virtual machines App Services More services

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Free Trial	Subscription	a week ago
sql-caio-ai1	SQL database	a week ago
sa-caio-ai1	Synapse workspace	2 weeks ago
rg-caio-ai	Resource group	2 weeks ago
df-caio-001	Data factory (V2)	3 weeks ago

Navigate

Subscriptions Resource groups All resources Dashboard

Tools <https://portal.azure.com/#create/hub>

Select the option CREATE A RESOURCE

A Cognitive Services - Microsoft Az x +

portal.azure.com/#blade/Microsoft_Azure_Marketplace/GalleryItemDetailsBladeNopdl/product/%7B"displayName"%3A"Cognitive%20Services"%2C"itemDisplayName"%3A"Cognitive%20Ser... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Home > Create a resource >

Cognitive Services

Microsoft

Cognitive Services Microsoft Add to Favorites

★★★★★ 4.4 (29 ratings)

Create

Overview Plans Usage Information + Support Reviews

Cognitive Services is a product bundle that enables customers to access multiple services with a single API key.

Product features:

- Access to Vision, Language, Search, and Speech services using a single API
- Quickly connect services together to achieve more insights into your content
- Easily integrate with other services like Azure Search

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Please refer to the [Online Services Terms](#) for details. Microsoft offers [policy controls](#) that may be used to disable new deployments.

More offers from Microsoft See All

https://portal.azure.com/#

Search for COGNITIVE SERVICES and select CREATE

Create Cognitive Services - Micro +

portal.azure.com/#create/Microsoft.CognitiveServicesAllInOne

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Create a resource > Cognitive Services >

Create Cognitive Services

Basics Identity Tags Review + create

Get access to Vision, Language, Search, and Speech Cognitive Services with a single API key. Quickly connect services together to achieve more insights into your content and easily integrate with other services like Azure Search. [Learn more](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ Free Trial

Resource group * ⓘ rg-caio-ai 

Create new

Region * ⓘ Brazil South

Instance details

Info Location specifies the region only for included regional services. This does not specify a region for included non-regional services. [Click here for more details.](#)

Review + create < Previous Next : Identity >

Add your COGNITIVE SERVICES information

Create Cognitive Services - Micro +

portal.azure.com/#create/Microsoft.CognitiveServicesAllInOne

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Create a resource > Cognitive Services >

Create Cognitive Services

Region * ⓘ Brazil South

i Location specifies the region only for included regional services. This does not specify a region for included non-regional services. Click here for more details.

Name * ⓘ cognitiveservices-caio

Pricing tier * ⓘ Standard S0

View full pricing details

By checking this box I acknowledge that I have read and understood all the terms below

Responsible AI Notice

Microsoft provides technical documentation regarding the appropriate operation applicable to this Cognitive Service that is made available by Microsoft. Customer acknowledges and agrees that they have reviewed this documentation and will use this service in accordance with it. This Cognitive Services is intended to process Customer Data that includes Biometric Data (as may be further described in product documentation) that Customer may incorporate into its own systems used for personal identification or other purposes. Customer acknowledges and agrees that it is responsible for complying with the Biometric Data obligations contained in the Online Services DPA.

Review + create < Previous Next : Identity > Add your COGNITIVE SERVICES information

The screenshot shows the Microsoft Azure 'Create Cognitive Services' interface. On the left, there are fields for 'Name' (cognitiveservices-caio) and 'Pricing tier' (Standard S0). Below these is a checkbox for acknowledging terms. To the right, a yellow-highlighted box contains the 'Responsible AI Notice' text. Three orange arrows point from the 'Name' and 'Pricing tier' fields towards the notice text. A large red arrow points from the 'I acknowledge' checkbox towards the same text.

Create Cognitive Services - Micro +

portal.azure.com/#create/Microsoft.CognitiveServicesAllInOne

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Create a resource > Cognitive Services >

Create Cognitive Services

Region * ⓘ Brazil South

Info Location specifies the region only for included regional services. This does not specify a region for included non-regional services. Click here for more details.

Name * ⓘ cognitiveservices-caio ✓

Pricing tier * ⓘ Standard S0

[View full pricing details](#)

By checking this box I acknowledge that I have read and understood all the terms below

Responsible AI Notice

Microsoft provides technical documentation regarding the appropriate operation applicable to this Cognitive Service that is made available by Microsoft. Customer acknowledges and agrees that they have reviewed this documentation and will use this service in accordance with it. This Cognitive Services is intended to process Customer Data that includes Biometric Data (as may be further described in product documentation) that Customer may incorporate into its own systems used for personal identification or other purposes. Customer acknowledges and agrees that it is responsible for complying with the Biometric Data obligations contained in the Online Services DPA.

Review + create  < Previous Next : Identity >

Review the information and select REVIEW + CREATE

Create Cognitive Services - Micro +

portal.azure.com/#create/Microsoft.CognitiveServicesAllInOne

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Home > Create a resource > Cognitive Services >

Create Cognitive Services

Validation Passed

Basics Identity Tags Review + create

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

Basics

Subscription	Free Trial
Resource group	rg-caio-ai
Region	Brazil South
Name	cognitiveservices-caio
Pricing tier	Standard S0

Create  < Previous Next Download a template for automation

Select CREATE

Home - Microsoft Azure

portal.azure.com/#home

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Azure services

Create a resource Cost Management ... Subscriptions All resources Data factories SQL databases Quickstart Center Virtual machines App Services More services

Recent resources

Name	Type	Last Viewed
cognitiveservices-caio	Cognitive Services	a few seconds ago
rg-caio-ai	Resource group	a few seconds ago
storageaccountcaio	Storage account	a week ago
Free Trial	Subscription	a week ago
sql-caio-ai1	SQL database	a week ago
sa-caio-ai1	Synapse workspace	2 weeks ago
df-caio-001	Data factory (V2)	3 weeks ago

Navigate

Subscriptions Resource groups All resources Dashboard

Go to HOME and check if your resource was created

Challenge #4.4

Azure Cognitive Services

Quick Start

Home - Microsoft Azure x + ▼ - □ X

portal.azure.com/#home ★

Microsoft Azure Upgrade Search resources, services, and docs (G+) ? 3 ? ? ?

Azure services

+ Create a resource Cost Management ... Subscriptions All resources Data factories SQL databases Quickstart Center Virtual machines App Services More services →

Recent resources

Name	Type	Last Viewed
cognitiveservices-caio	Cognitive Services	a few seconds ago
rg-caio-ai	Resource group	a few seconds ago
storageaccountcaio	Storage account	a week ago
Free Trial	Subscription	a week ago
sql-caio-ai1	SQL database	a week ago
sa-caio-ai1	Synapse workspace	2 weeks ago
df-caio-001	Data factory (V2)	3 weeks ago

Orange arrow pointing to the 'cognitiveservices-caio' row in the Recent resources table.

Navigate

Yellow key icon Subscriptions Blue cube icon Resource groups Green grid icon All resources Green chart icon Dashboard

Select your COGNITIVE SERVICES resource

A cognitiveservices-caio - Microsoft +

portal.azure.com/#@craigasparine@gmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveServices... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ 🔍 ⚙️ 🌐 ? 🔍

Home > cognitiveservices-caio

cognitiveservices-caio | Quick start

Cognitive Services

Search (Ctrl+ /) <>

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource Management

Quick start

Keys and Endpoint

Pricing tier

Networking

Identity

Billing By Subscription

Properties

Locks

Monitoring

Alerts

You are all set! Follow the steps below to use your Cognitive Service resource

Use the same key and endpoint in any of the services listed below

Grab your keys and endpoint

Every call to Cognitive Services requires the subscription key above. This key needs to be either passed through a query string parameter or specified in the request header. To manage your keys, use the Keys option from the left menu

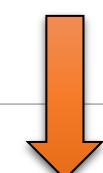
Get an overview of what you can do with the Cognitive Services

Documentation - Access Quickstarts with code samples, in-depth tutorials and how-to guides
Courses - Explore the free Cognitive Services courses in Microsoft Learn
Community - Ask and answer questions within a community of developers using the Cognitive Services

Get Started with the Cognitive Services

Cognitive Services available to use with your key and endpoint.

Computer Vision - Analyze images
Content Moderator - Check text, image or videos for offensive or undesirable content
Face - Recognize people and their attributes in an image
Form Recognizer - Identify and extract text, key/value pairs and table data from form documents
Custom Vision * - Custom Vision lets you build, deploy, and improve your own image classifiers.



Scroll down...

cognitiveservices-caio - Microsoft +

portal.azure.com/#@craigasparine@gmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveServices...

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cognitiveservices-caio | Quick start

Get an overview of what you can do with the Cognitive Services

Documentation - Access Quickstarts with code samples, in-depth tutorials and how-to guides
Courses - Explore the free Cognitive Services courses in Microsoft Learn
Community - Ask and answer questions within a community of developers using the Cognitive Services

2

Get Started with the Cognitive Services

Cognitive Services available to use with your key and endpoint.

Computer Vision - Analyze images
Content Moderator - Check text, image or videos for offensive or undesirable content
Face - Recognize people and their attributes in an image
Form Recognizer - Identify and extract text, key/value pairs and table data from form documents
Custom Vision * - Custom Vision lets you build, deploy, and improve your own image classifiers.
Language Understanding - Extract meaning from natural language
Speech - Transform speech-to-text, text-to-speech and recognize speakers
Text Analytics - Detect sentiment, key phrases, entities and human language type in text
Translator - Translate text in near real-time
Video Indexer - Analyze video and audio
* supported only in few regions

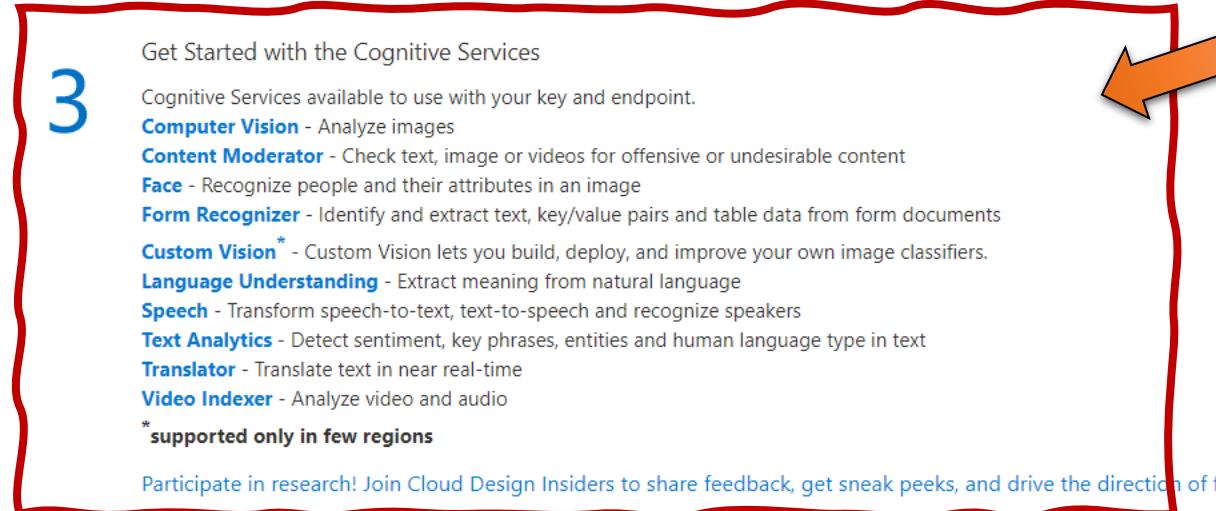
Participate in research! Join Cloud Design Insiders to share feedback, get sneak peeks, and drive the direction of future improvements with us.

3

Cognitive Services containers

Several Cognitive Services APIs are also available as a Docker container. This enables you to run the API on-premises if you don't want your data to leave your machine or environment. These containers have the same interfaces and capabilities as the operation in the hosted API.

[Get Started](#)



These are all the Cognitive Services available (June, 2021)

How does it work?

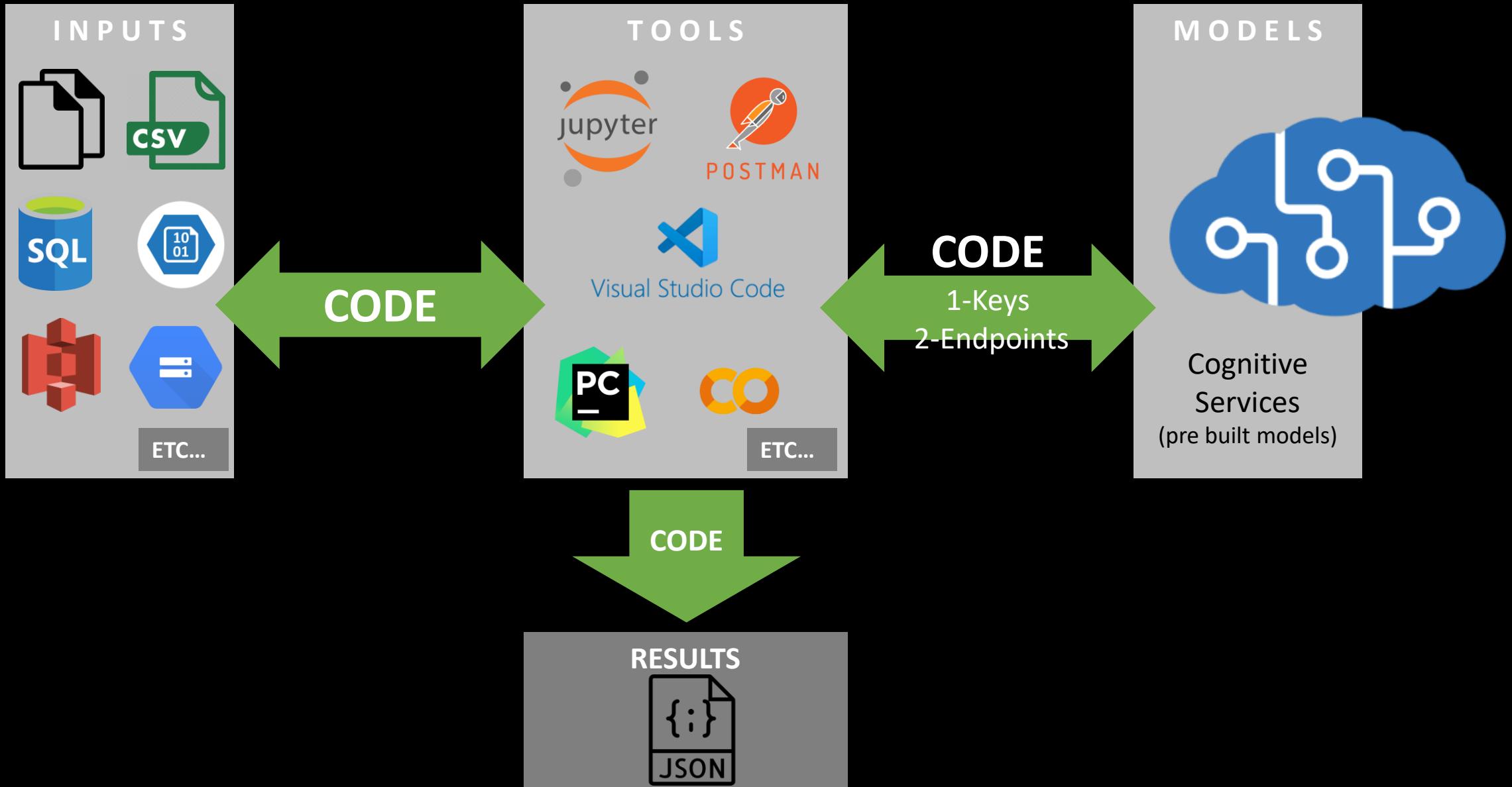
What is Azure Cognitive Services?

Cognitive Services brings AI within reach of every developer—without requiring machine learning expertise. All it takes is an API call to embed the ability to see, hear, speak, search, understand, and accelerate decision-making into your apps. Enable developers of all skill levels to easily add AI capabilities to their apps.

Watch this 50-second video to see how to deploy AI for various use cases using the programming languages you already know.



How does it work?



Challenge #4.5

Tools / IDE's

Project Jupyter | Home x +

← → C ⌂ 🔒 jupyter.org ☆

jupyter

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Project Jupyter exists to develop open-source software, open-standards, and services for interactive computing across dozens of programming languages.

Anaconda | Individual Edition

anaconda.com/products/individual

The landing page features a large green header with the Anaconda logo and navigation links for Products, Pricing, Solutions, and Resources. Below the header, five edition options are listed with icons: Individual Edition (Open Source Distribution), Commercial Edition (Premium Package Repository), Team Edition (On-prem Package Repository), Enterprise Edition (Full Data Science Platform), and Professional Services (Data Experts Work Together). A large call-to-action button at the bottom right says "Your data science toolkit" and "With over 25 million users".

<https://www.anaconda.com/products/individual>

The Navigator interface shows a grid of applications. Applications include: CMD.exe Prompt, DataLore, IBM Watson Studio Cloud, JupyterLab, Jupyter Notebook, and PowerShell Prompt. Other visible applications include PyCharm Community, Qt Console, Spyder, VS Code, GivePy, and Orange 3.

<https://www.anaconda.com/>



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Version: 2021.1.2
Build: 211.7442.45
1 June 2021

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[Installation Instructions](#)
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[Y]es, I agree [N]o, thanks

~ root#



Get the Toolbox App to download PyCharm and its future updates with ease

Programiz: Learn to Code for Free +

programiz.com

Programiz Tutorials Examples Search tutorials and examples

The screenshot shows the Programiz Online Python Compiler interface. It features two code editors side-by-side. The left editor has a dark theme and contains the following Python code:main.py
1 # Some Example code
2 import os
3 from package import ParentClass
4
5 @nonsenseDecorator
6 def doesNothing():
7 pass
8
9 class ExampleClass(ParentClass):
10 @staticmethod
11 def example(inputStr):
12 a = list(inputStr)
13 a.reverse()
14 return ''.join(a)
15
16 def __init__(self,
17 mixin='Hello'):
18 self.mixin = mixin
19
20
21
22
23
24
25
26
27
28
29

The right editor has a light theme and shows the same code with some changes:main.py
1 # Some Example code
2 import os
3 from package import ParentClass
4
5 @nonsenseDecorator
6 def doesNothing():
7 pass
8
9 class ExampleClass(ParentClass):
10 @staticmethod
11 def example(inputStr):
12 a = list(inputStr)
13 a.reverse()
14 return ''.join(a)
15
16 def __init__(self,
17 mixin='Hello'):
18 self.mixin = mixin
19
20
21
22
23
24
25
26
27
28
29

Below the editors is a shell window showing the output of a command:a = 10
a = 10
|

A large orange circle is overlaid on the right side of the interface. To the right of the circle, there is promotional text:

Online Python Compiler

Get started with Python in no time. Now you can write and run Python code online in your browser.

[Run Python Online](#)

Welcome To Colaboratory - Colab

colab.research.google.com/notebooks/intro.ipynb#recent=true

Welcome To Colaboratory

File Edit View Insert Runtime Tools Help

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Getting started

Data science

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Section

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CO Welcome To Colaboratory	5:51 PM	5:51 PM	
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CO Colab's New Code Editor	Oct 31, 2019	Oct 31, 2019	
Untitled	Oct 31, 2019	Oct 31, 2019	 

New notebook Cancel

To execute the code in the above cell, select it with a click and then either press the play button to the left of the code, or use the keyboard

<https://colab.research.google.com/>

machinelearning-ai1006 - Micros x Notebooks - Microsoft Azure Ma x + ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-460f-ae... ☆

Microsoft Azure Machine Learning

Home > Notebooks

Notebooks

Files Samples

Editing

ML

```
1 import requests, uuid, json
2
3 # Add your subscription key and endpoint
4 subscription_key = "adbc876dcfc14863ae2df143c413c88b"
5 endpoint = "https://api.cognitive.microsofttranslator.com"
6
7 # Add your location, also known as region. The default is global.
8 # This is required if using a Cognitive Services resource.
9 location = "eastus"
10
11 path = '/translate'
12 constructed_url = endpoint + path
13
14 params = {
15     'api-version': '3.0',
16     'from': 'en',
17     'to': ['de', 'it']
18 }
19 constructed_url = endpoint + path
20
21 headers = {
22     'Ocp-Apim-Subscription-Key': subscription_key,
23     'Ocp-Apim-Subscription-Region': location,
24     'Content-type': 'application/json',
25     'X-ClientTraceId': str(uuid.uuid4())
26 }
27
28 # You can pass more than one object in body.
```



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Version 1.57 is now available! Read about the new features and fixes from May.

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System Installer
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64 bit 32 bit ARM
64 bit 32 bit ARM
64 bit 32 bit ARM

↓ .deb

Debian, Ubuntu

.deb 64 bit ARM ARM 64
.rpm 64 bit ARM ARM 64
.tar.gz 64 bit ARM ARM 64

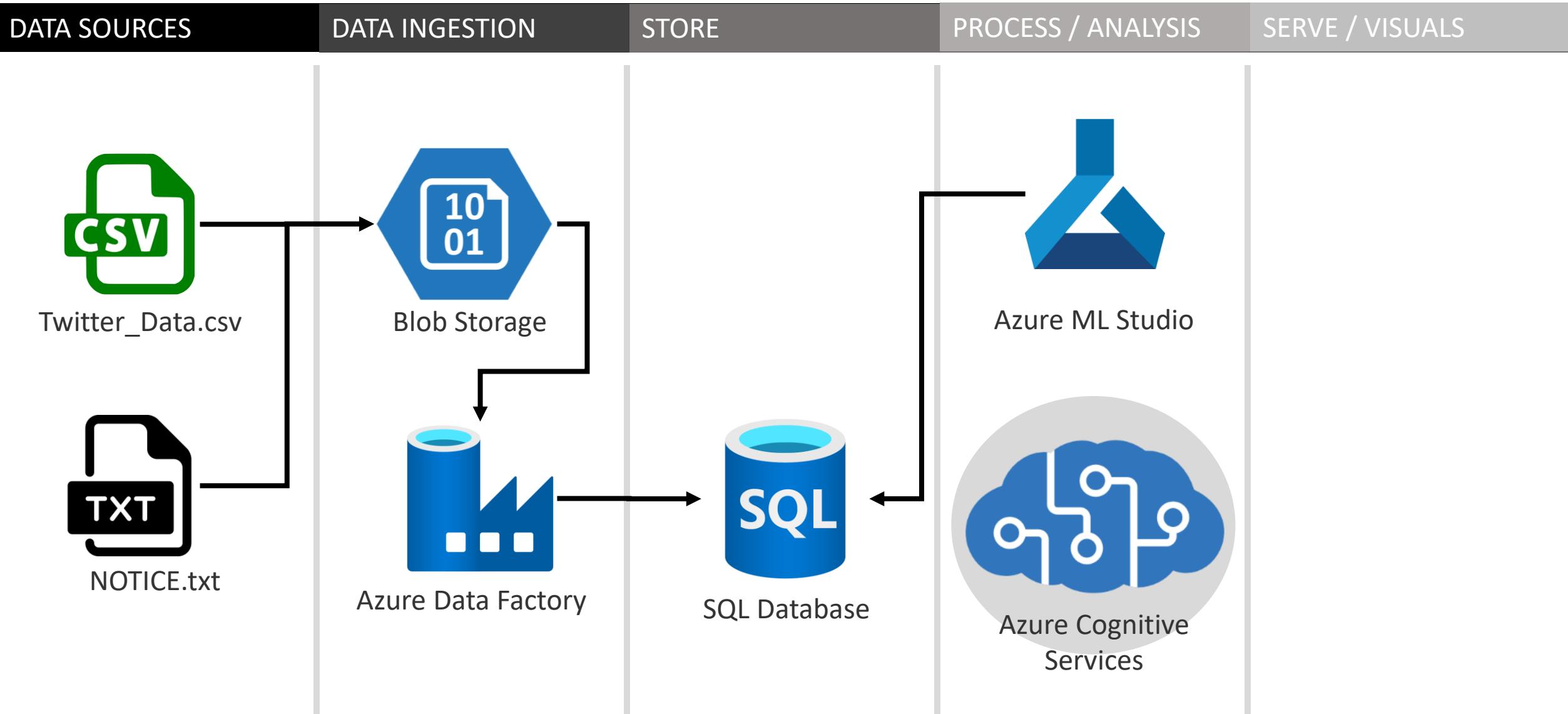
Snap Store

↓ Mac

macOS 10.10+

.zip Universal Intel Chip Apple Silicon

Data Architecture so far...



References

Official Prep Training Exam **AI-102: Designing and Implementing a Microsoft Azure AI Solution**

Azure Portal, <https://portal.azure.com/#home>

Azure **Cognitive Services**, <https://azure.microsoft.com/en-ca/services/cognitive-services/>

Azure **Machine Learning**, <https://azure.microsoft.com/en-ca/services/machine-learning/>

Azure **Machine Learning Studio**, <https://studio.azureml.net/>

Microsoft Learn, <https://docs.microsoft.com/en-us/learn/>

Microsoft Learn, Course AI-102T00: Designing and Implementing a Microsoft Azure AI Solution,

<https://docs.microsoft.com/en-us/learn/certifications/courses/ai-102t00>

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Microsoft Learn, Code Samples, <https://docs.microsoft.com/en-us/samples/browse/>

Microsoft Official **Git Hub**, **AI-Basic examples for all APIs**, <https://github.com/MicrosoftDocs/ai-fundamentals>

Microsoft Official **Git Hub**, **Microsoft learn AI-900**, <https://github.com/MicrosoftLearning/mslearn-ai900>

Microsoft Official **Git Hub**, **Microsoft learn AI-102**, <https://github.com/MicrosoftLearning/AI-102-AIEngineer>

Thank you! ;-)

Please e-mail me the screenshots of your final steps for each component / service to validate your bonus points.

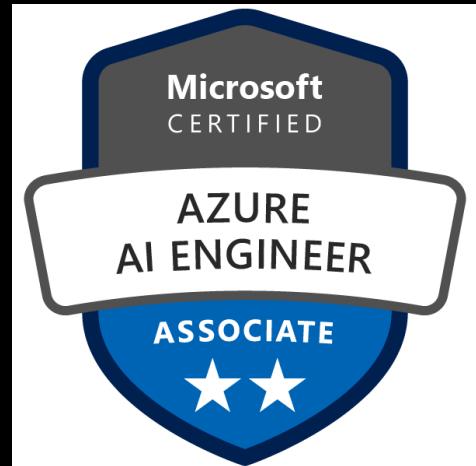
Challenge #4 // Part 2

Azure Cognitive Services

Using API's

IN THIS CHALLENGE:

6. Translator API (Cognitive Services and Translator)
7. Run your code using Azure ML Studio
8. Face API
9. Computer Vision
10. LUIS (Language Understanding)



This content is based on the main requirements for AI-102 Certification



Exam AI-102: Designing and Implementing a Microsoft Azure AI Solution

Candidates for Exam AI-102 should have subject matter expertise building, managing, and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework.

Candidates for this exam should be proficient in C#, Python, or JavaScript and should be able to use REST-based APIs and SDKs to build computer vision, natural language processing, knowledge mining, and conversational AI solutions on Azure. They should also understand the components that make up the Azure AI portfolio and the available data storage options. Plus, candidates need to understand and be able to apply responsible AI principles.

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10. Assignment: User may not assign or transfer this Agreement without the prior written consent of Apple.
11. Miscellaneous: This Agreement may not be modified except in writing signed by both parties.
12. Severability: If any provision of this Agreement is held invalid or unenforceable, the remaining provisions will remain in effect.
13. Acknowledgment: User has read and understood the terms and conditions of this Agreement and agrees to be bound by them.
14. Signature: _____
15. Date: _____



I promise that I
will tell every person
without asking why Linux
is so much better than
every other operating system.



Before we start there are some important clarifications points:



- (1) Troubleshooting is REALLY important** – It is important for you to find the bugs in your code, env, IDE, etc.
- (2) The code IS JUST a code** – There are several ways to write a code and different languages. The examples here are just one way to do it.
- (3) This IS NOT a prep course** – The main goal here is to show the practical application of the Azure Resources with a focus on Enterprise AI solutions.
- (4) You won't be graded by the challenges** but, they are an important practical component in your learning experience.

First Steps

(1) Download the source files:

<https://github.com/caiogasparine/AIDI1006>

(2) Copy the folder IMAGES to your root directory - C:

(There are some files used as example in this folder)

ATTENTION!

Troubleshooting...

is part of the challenge

Challenge #4.6

Translator API (Cognitive Services)

 **Translator**  Add to Favorites

Microsoft
★★★★★ 4.0 (212 ratings)

[Create](#)

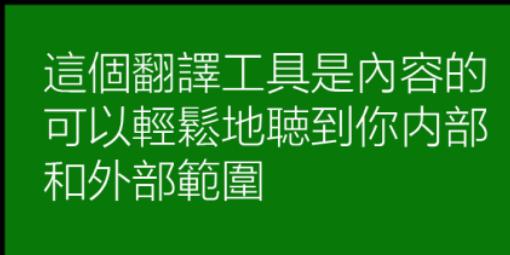
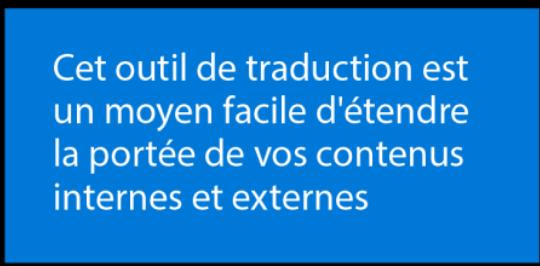
 **Cognitive Services**  Add to Favorites

Microsoft
★★★★★ 4.4 (29 ratings)

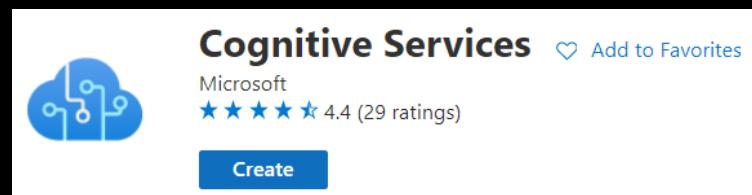
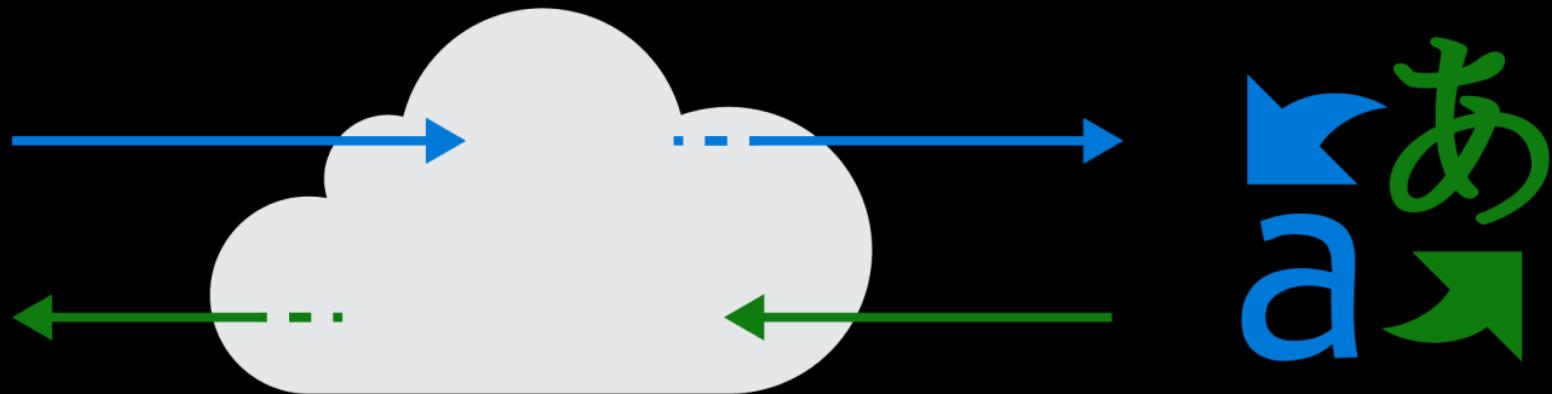
[Create](#)

How it works?

Client app or web page



Web API



jupyter Untitled1 Last Checkpoint: 11 minutes ago (autosaved)

The screenshot shows the Jupyter Notebook interface. The top menu bar includes File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. Below the menu bar is a toolbar with icons for file operations (New, Open, Save, Copy, Paste, Find, etc.), cell execution (Run, Cell, Cell Block, Cell Range), and code editor (Code, Cell Editor).

There are several different ways to write your code. This is just one of them.

```
In [6]: import requests, uuid, json

# Add your subscription key and endpoint
subscription_key = "95[REDACTED]1beb"
endpoint = "https://api.cognitive.microsofttranslator.com"

# Add your location, also known as region. The default is global.
# This is required if using a Cognitive Services resource.
location = "brazilsouth"

path = '/translate'
constructed_url = endpoint + path

params = {
    'api-version': '3.0',
    'from': 'en',
    'to': ['de', 'it']
}
constructed_url = endpoint + path

headers = {
    'Ocp-Apim-Subscription-Key': subscription_key,
    'Ocp-Apim-Subscription-Region': location,
    'Content-type': 'application/json',
    'X-ClientTraceId': str(uuid.uuid4())
}

# You can pass more than one object in body.
body = [
    {
        'text': 'Hello World!'
    }
]

request = requests.post(constructed_url, params=params, headers=headers, json=body)
```



AIDI1006-text-translator.ipynb

A machinelearning-ai1006 - Micros x Notebooks - Microsoft Azure Ma x + ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-460f-ae... ☆

Microsoft Azure Machine Learning

Home > Notebooks

Notebooks

Files Samples

Editing

ML

```
1 import requests, uuid, json
2
3 # Add your subscription key and endpoint
4 subscription_key = "ad[REDACTED]88b"
5 endpoint = "https://api.cognitive.microsofttranslator.com"
6
7 # Add your location, also known as region. The default is global.
8 # This is required if using a Cognitive Services resource.
9 location = "eastus"
10
11 path = '/translate'
12 constructed_url = endpoint + path
13
14 params = {
15     'api-version': '3.0',
16     'from': 'en',
17     'to': ['de', 'it']
18 }
19 constructed_url = endpoint + path
20
21 headers = {
22     'Ocp-Apim-Subscription-Key': subscription_key,
23     'Ocp-Apim-Subscription-Region': location,
24     'Content-type': 'application/json',
25     'X-ClientTraceId': str(uuid.uuid4())
26 }
27
28 # You can pass more than one object in body.
```

There are several different ways to write your code. This is just one of them.

The code // Azure Machine Learning Studio

AIDI1006-text-translator.ipynb

File Edit View Navigate Code Refactor Run Tools VCS Window Help text-translator - main.py

text-translator > main.py

Project main.py

```
import requests, uuid, json

# Add your subscription key and endpoint
subscription_key = "adb[REDACTED]c88b"
endpoint = "https://api.cognitive.microsofttranslator.com"

# Add your location, also known as region. The default is global.
# This is required if using a Cognitive Services resource.
location = "eastus"

path = '/translate'
constructed_url = endpoint + path

params = {
    'api-version': '3.0',
    'from': 'en',
    'to': ['de', 'it']
}
constructed_url = endpoint + path

headers = {
if __name__ == '__main__':
```

There are several different ways to write your code. This is just one of them.

Run: main

```
C:\Users\caio\PycharmProjects\text-translator\venv\Scripts\python.exe C:/Users/caio\PycharmProjects\text-translator/main.py
```

2: Structure

2: Favorites

The code // Pycharm

AIDI1006-text-translator.ipynb

```
import requests, uuid, json
```

```
# Add your subscription key and endpoint
subscription_key = "YOUR SUBSCRIPTION"
endpoint = "https://api.cognitive.microsofttranslator.com"
```

```
# Add your location, also known as region. The default is global.
# This is required if using a Cognitive Services resource.
location = "YOUR SUBSCRIPTION LOCATION"
```

```
path = '/translate'
constructed_url = endpoint + path
```

```
params = {
    'api-version': '3.0',
    'from': 'en',
    'to': ['de', 'it']
}
```

```
constructed_url = endpoint + path
```

```
headers = {
    'Ocp-Apim-Subscription-Key': subscription_key,
    'Ocp-Apim-Subscription-Region': location,
    'Content-type': 'application/json',
    'X-ClientTraceId': str(uuid.uuid4())
}
```

```
# You can pass more than one object in body.
body = [
    {
        'text': 'Hello World!'
    }
]
```

```
request = requests.post(constructed_url, params=params, headers=headers, json=body)
response = request.json()
```

```
print(json.dumps(response, sort_keys=True, ensure_ascii=False, indent=4, separators=(',', ': ')))
```

There are several different ways to write your code. This is just one of them.

Home > cognitiveservices-caio

 cognitiveservices-caio | Keys and Endpoint
Cognitive Services

Cognitive Services

Search (Ctrl + /)

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Diagnose and solve problems

Resource Management

 Quick start

Keys and Endpoint

Pricing tier

 Networking

 Identity

Billing By Subscription

三、

8

The code

 Regenerate Key1  Regenerate Key2

 Regenerate Key1  Regenerate Key2

Show Key

KEY 1

.....

KEY 2

Page 10 of 10

Location ⓘ

brazilsout

Endpoint

<https://cognitiveservices-cafe.cognitiveServices.azure.com>



jupyter Untitled1 Last Checkpoint: 14 minutes ago (autosaved)

```
File Edit View Insert Cell Kernel Widgets Help  
File + % & Run Stop Cell Code  
'Ocp-Apim-Subscription-Region': location,  
'Content-type': 'application/json',  
'X-ClientTraceId': str(uuid.uuid4())  
}  
  
# You can pass more than one object in body.  
body = [{  
    'text': 'Hello World!'  
}]  
  
request = requests.post(constructed_url, params=params, headers=headers, json=body)  
response = request.json()  
  
print(json.dumps(response, sort_keys=True, ensure_ascii=False, indent=4, separators=(',', ': ')))
```

```
[  
  {  
    "translations": [  
      {  
        "text": "Hallo Welt!",  
        "to": "de"  
      },  
      {  
        "text": "Salve, mondo!",  
        "to": "it"  
      }  
    ]  
  }  
]
```



There are several different ways to write your code. This is just one of them.

About Keys

- **Key 1 – can be refreshed**
- **Key 2 – can be refreshed**

They are backups in case of endpoint misuse



Challenge #4.6

Translator API (Translator)



Translator ♥ Add to Favorites

Microsoft
★★★★★ 4.0 (212 ratings)

Create



Cognitive Services ♥ Add to Favorites

Microsoft
★★★★★ 4.4 (29 ratings)

Create

Translator - Microsoft Azure x + ▼ - □ x

portal.azure.com/#blade/Microsoft_Azure_Marketplace/GalleryItemDetailsBladeNopdl/product/%7B"displayName"%3A"Translator"%2C"itemDisplayName"%3A"Translator"%2C"id"%3A"...

Microsoft Azure Upgrade Search resources, services, and docs (G+) ... 1 ? ?

Home > Create a resource >

Translator

Microsoft

 **Translator** Add to Favorites

Microsoft ★★★★★ 4.0 (212 ratings)

Create

Overview Plans Usage Information + Support Reviews

Easily integrate real-time text translation capabilities into your application's websites, tools, or any solution requiring multi-language support such as website localization, e-commerce, customer support, messaging applications, internal communication, and more.

More offers from Microsoft See All

 Workspace Microsoft Virtual Machine Azure Virtual Desktop resource	 Microsoft HPC Pack 2012 R2 Microsoft Virtual Machine Enterprise-class HPC solution. Easy to deploy, cost-effective and supports Windows/Linux workloads.	 Windows 10 IoT Core Services Microsoft Azure Service Commercialize your project with enterprise-grade security and support	 Web App + SQL Microsoft Azure Service Enjoy secure and flexible development, deployment, and scaling options for your web app
--	---	---	--

Search for TRANSLATOR

Create Translator - Microsoft Azure +

portal.azure.com/#create/Microsoft.CognitiveServicesTextTranslation

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Home > Create a resource > Translator >

Create Translator

manage all your resources.

Subscription * Free Trial

Resource group * rg-caio-ai

Create new

Region * East US

Name * translator-caio

Pricing tier * Free F0 (Up to 2M characters translated per month)

View full pricing details

Review + create < Previous Next : Identity >

Add all the information for your resource

A translator-caio - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveSe... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ 🔍 🌐 🚧 🛡️ ? 🔍

Home > Microsoft.CognitiveServicesTextTranslation-20210611093411 > translator-caio

 translator-caio | Quick start ... ×

Cognitive Services

Search (Ctrl+ /) «

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

Quick start Keys and Endpoint Encryption Pricing tier Networking

Identity Billing By Subscription Properties Locks

Monitoring

Congratulations! Your keys are ready.

Now explore the Quickstart guidance to get up and running with Translator.



1 Get the API Key to authenticate your applications and start sending calls to the service.
Every call to Translator API requires the subscription key. The key can be found in the Keys and Endpoint section in the left pane. This key needs to be either passed through a query string parameter or specified in the request header.

2 Make an API call
Get in-depth information about the properties and methods of the API. Test your keys with the built-in testing console without writing a single line of code.
[API reference](#)

3 Enjoy coding
Speed up your learning with quick starts, how-to guidance and much more
[Documentation](#) [Code samples](#)

Translator up and running!

A translator-caio - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveSe... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ 🔍 🚧 🛡️ ? 🔍

Home > Microsoft.CognitiveServicesTextTranslation-20210611093411 > translator-caio

translator-caio | Keys and Endpoint

Cognitive Services

Search (Ctrl+ /) Regenerate Key1 Regenerate Key2

necessary to make an API call. When regenerating the first key, you can use the second key for continued access to the service.

Show Keys

KEY 1
.....

KEY 2
.....

Location ⓘ
eastus

Web API Containers

ⓘ Use the below endpoints while using the Web API. To force the request to be handled by a specific geography, see here.

Text Translation <https://api.cognitive.microsofttranslator.com/>

Document Translation <https://translator-caio.cognitiveservices.azure.com/>

Check your Endpoints (Web API)



SCREENSHOT!

- (1) Now try to run your code using the **Translator** resource instead of **Cognitive Services**

- (2) Add translations (text next slide) to Filipino, French (Canada), Punjabi, Turkish, and English.

Text to be translated: (Brazilian Portuguese)

Tudo em torno de Paulo Coelho é superlativo. Do banheiro para visitas decorado com um quadro assinado por Andy Warhol ao elevador de vidro que vai da sala de estar ao enorme terraço sob os Alpes suíços. Dos mais de 325 milhões de livros vendidos e um bilhão de leitores em 150 países, ao recorde de escritor vivo mais traduzido do mundo e quase 50 milhões de seguidores em redes sociais. Da tortura a que foi submetido durante três meses, em 1974, à forma contundente como critica o governo brasileiro, em 2019.

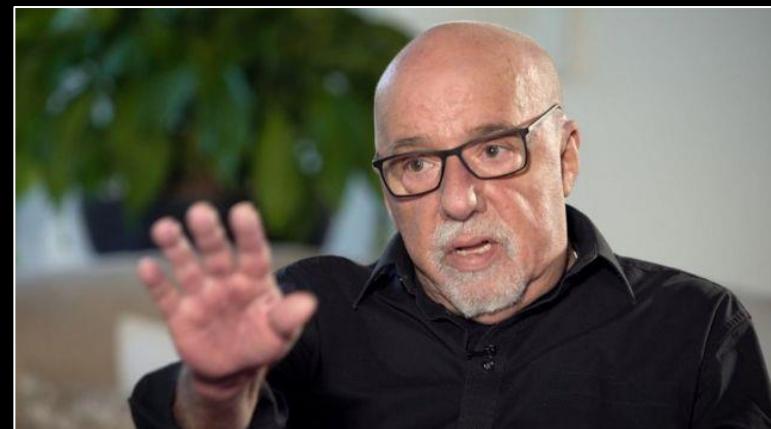
"O compromisso histórico é não ficar calado. Eu tenho que falar. Vou perder leitores? Vou. Tenho perdido? Devo estar perdendo? Não sei. Eu não fico contabilizando", diz, enquanto a esposa Christina Oiticica, que acompanha a entrevista, assente com um leve gesto de aprovação.

Em livros como *Hippie*, o mais recente (2018), ou *O Aleph*, de 2010, Paulo Coelho alerta que o passado pode destruir o presente. Mas, nesta entrevista, ele decide lembrar com detalhes dos meses em que foi espancado, teve os genitais presos a eletrodos e foi trancafiado nu, com um capuz, em uma sala gelada e escura por agentes da ditadura.

Interview with Paulo Coelho
Brazilian writer on September 25th 2019.

BBC News Brazil

<https://www.bbc.com/portuguese/brasil-49665128>



Home x AIDI1006-text-translator - Jupyter +

localhost:8888/notebooks/AIDI1006-text-translator.ipynb

jupyter AIDI1006-text-translator Last Checkpoint: Last Friday at 9:50 AM (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

response = request.json()
print(json.dumps(response, sort_keys=True, ensure_ascii=False, indent=4, separators=(',', ': ')))

[
 {
 "translations": [
 {
 "text": "Alles rund um Paulo Coelho ist superlativ. Vom Gästebad mit einem von Andy Warhol signierten Gemälde bis zum gläsernen Aufzug, der vom Wohnzimmer auf die riesige Terrasse unter den Schweizer Alpen führt. Von den mehr als 325 Millionen verkauften Büchern und einer Milliarde Lesern in 150 Ländern, auf den Rekord für den weltweit meistübersetzten lebenden Schriftsteller und fast 50 Millionen Follower in sozialen Netzwerken. Von der Folter, der er 1974 drei Monate lang ausgesetzt war, bis hin zu der harten Art und Weise, wie er die brasilianische Regierung 2019 kritisiert. Das historische Engagement besteht nicht darin, zu schweigen. Ich muss reden. Werde ich Leser verlieren? Ich werde gehen. Habe ich verloren? Sollte ich verlieren? Ich weiß nicht, ich weiß nicht Ich zähle nicht weiter, sagt er, während seine Frau Christina Oiticica, die das Interview begleitet, sich mit einer leichten Geste der Zustimmung niederließ. In Büchern wie Hippie, dem jüngsten (2018) oder The Aleph, 2010, warnt Paulo Coelho davor, dass die Vergangenheit die Gegenwart zerstören kann. Aber in diesem Interview beschließt er, sich im Detail an die Monate zu erinnern, in denen er geschlagen wurde, seine Genitalien an Elektroden hängen ließ und nackt, mit Kapuze, in einem kalten und dunklen Raum von Agenten der Diktatur eingesperrt wurde.",
 "to": "de"
 },
 {
 "text": "Tutto intorno a Paulo Coelho è superlativo. Dal bagno degli ospiti decorato con un dipinto firmato da Andy Warhol all'ascensore di vetro che va dal soggiorno all'enorme terrazza sotto le Alpi svizzere. Degli oltre 325 milioni di libri venduti e un miliardo di lettori in 150 paesi, al record per lo scrittore vivente più tradotto al mondo e quasi 50 milioni di follower sui social network. Dalla tortura a cui è stato sottoposto per tre mesi, nel 1974, al modo duro in cui critica il governo brasiliano nel 2019. L'impegno storico non è quello di tacere. Devo parlare. Perderò lettori? Me ne vado. Ho perso? Dovrei perdere? Non lo so, non lo so Non continuo a contare - dice - mentre sua moglie Christina Oiticica, che accompagna l'intervista, si è sistemata con un leggero gesto di approvazione. In libri come Hippie, il più recente (2018), o The Aleph, 2010, Paulo Coelho avverte che il passato può distruggere il presente. Ma in questa intervista, decide di ricordare nel dettaglio i mesi in cui è stato picchiato, ha attaccato i genitali agli elettrodi ed è stato chiuso nudo, con un cappuccio, in una stanza fredda e buia dagli agenti della dittatura.",
 "to": "it"
 },
]
 }]

SCRENSHOT!

Expected result...

Challenge #4.7

Azure Cognitive Services

Run your code using Azure ML Studio

A machinelearning-ai1006 - Micros x Notebooks - Microsoft Azure Ma x + ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-460f-ae

Microsoft Azure Machine Learning

Home > Notebooks

Notebooks

Files Samples

text-translator.ipynb

machinelearning-pc · Jupyter kernel idle

```
24     'Content-type': 'application/json',
25     'X-ClientTraceId': str(uuid.uuid4())
26 }
27
28 # You can pass more than one object in body.
29 body = [
30     'text': 'Hello World!'
31 ]
32
33 request = requests.postconstructed_url, params=params, headers=headers, json=body)
34 response = request.json()
35
36 print(json.dumps(response, sort_keys=True, ensure_ascii=False, indent=4, separators=', : '))
```

<1 sec

```
[{
    "translations": [
        {
            "text": "Hallo Welt!",
            "to": "de"
        },
        {
            "text": "Salve, mondo!",
            "to": "it"
        }
    ]
}]
```

Editors Compute: machinelearning-pc - Running

SCRENSHOT! Python 3.6.9

There are several different ways to write your code. This is just one of them.

A machinelearning-ai1006 - Micros x Notebooks - Microsoft Azure Ma x New Tab x | +

← → C ⌘ ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=36

Microsoft Azure Machine Learning

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Notebooks

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machinelearning-pc · Jupyter kernel idle

Confirm stop compute

Stopping the compute will stop the kernel and halt any notebook execution.

Are you sure you want to continue?

Confirm Cancel

ATTENTION!

The screenshot shows the Microsoft Azure Machine Learning Studio interface. On the left, there's a sidebar with various icons and a list of notebooks. A file named 'text-translator.ipynb' is selected. In the main area, a code editor window is open with Python 3.6 - AzureML selected. The code in the editor is related to a text translator API. A confirmation dialog box is overlaid on the screen, asking if the user wants to stop the compute. The dialog has 'Confirm' and 'Cancel' buttons. The background of the dialog is white, and it has a semi-transparent black overlay. The word 'ATTENTION!' is written in large, yellow, stylized letters on a red speech bubble graphic in the top right corner of the page.

Challenge #4.8

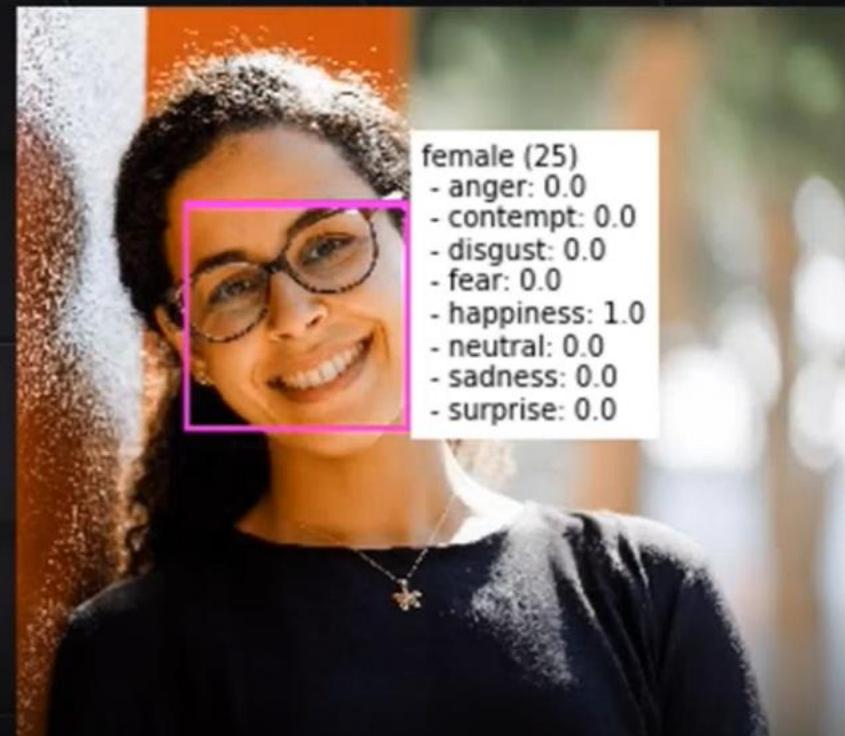
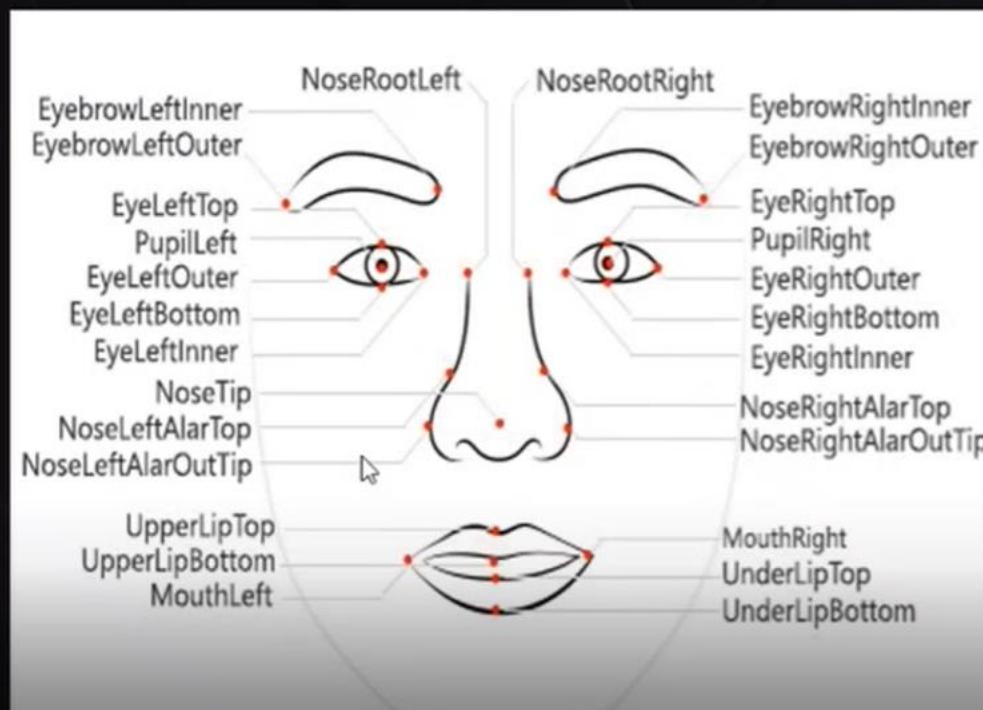
Azure Cognitive Services

Face API

Face API

The Azure Face service provides AI algorithms that detect, recognize, and analyze human faces in images. Facial recognition software is important in many different scenarios, such as security, natural user interface, image content analysis and management, mobile apps, and robotics.

Facial analysis



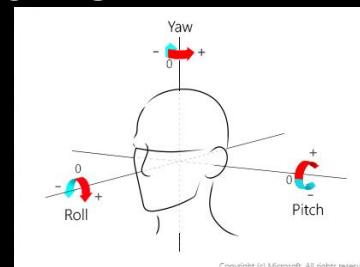
Attributes

Attributes are a set of features that can optionally be detected by the [Face - Detect](#) API. The following attributes can be detected:

- **Accessories.** Whether the given face has accessories. This attribute returns possible accessories including headwear, glasses, and mask, with confidence score between zero and one for each accessory.
- **Age.** The estimated age in years of a particular face.
- **Blur.** The blurriness of the face in the image. This attribute returns a value between zero and one and an informal rating of low, medium, or high.
- **Emotion.** A list of emotions with their detection confidence for the given face. Confidence scores are normalized, and the scores across all emotions add up to one. The emotions returned are happiness, sadness, neutral, anger, contempt, disgust, surprise, and fear.
- **Exposure.** The exposure of the face in the image. This attribute returns a value between zero and one and an informal rating of underExposure, goodExposure, or overExposure.
- **Facial hair.** The estimated facial hair presence and the length for the given face.
- **Gender.** The estimated gender of the given face. Possible values are male, female, and genderless.
- **Glasses.** Whether the given face has eyeglasses. Possible values are NoGlasses, ReadingGlasses, Sunglasses, and Swimming Goggles.
- **Hair.** The hair type of the face. This attribute shows whether the hair is visible, whether baldness is detected, and what hair colors are detected.

Attributes (2)

- **Head pose.** The face's orientation in 3D space. This attribute is described by the roll, yaw, and pitch angles in degrees, which are defined according to the right-hand rule. The order of three angles is roll-yaw-pitch, and each angle's value range is from -180 degrees to 180 degrees. 3D orientation of the face is estimated by the roll, yaw, and pitch angles in order. See the following diagram for angle mappings:
- **Makeup.** Whether the face has makeup. This attribute returns a Boolean value for eyeMakeup and lipMakeup.
- **Mask.** Whether the face is wearing a mask. This attribute returns a possible mask type, and a Boolean value to indicate whether nose and mouth are covered.
- **Noise.** The visual noise detected in the face image. This attribute returns a value between zero and one and an informal rating of low, medium, or high.
- **Occlusion.** Whether there are objects blocking parts of the face. This attribute returns a Boolean value for eyeOccluded, foreheadOccluded, and mouthOccluded.
- **Smile.** The smile expression of the given face. This value is between zero for no smile and one for a clear smile.



face-api-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveServices...

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Home > face-api-ai1006

face-api-ai1006 | Quick start

Cognitive Services

Search (Ctrl+/)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource Management

Quick start

Keys and Endpoint

Pricing tier

Networking

Identity

Billing By Subscription

Properties

Locks

Monitoring

Alerts

Explore the Quickstart guidance to get up and running with Face.



Get the API Key and endpoint to authenticate your applications and start sending calls to the service.

1 All Face calls and docker container activations require a key. The key can be found in the Keys and Endpoint section in the left pane. Specify the key either in the request header (Web API), the Face client (SDK), or through the command-line (Docker container).

2 Try the service in the API console - requires API Key and selecting your location.
Use the API Console to try the API without writing code. Be sure to select the correct location for this resource. The API key and the location can be found in the Keys and Endpoint section in the left tab.

3 Make a web API call - requires your API Key and endpoint
Use the sample code in these quickstarts to begin integrating Face into your applications to detect, recognize and analyze human faces in images

C# Quickstart

Python Quickstart

Learn more about the APIs

https://go.microsoft.com/fwlink/?linkid=2109273

Face API Console

face-api-ai1006 - Microsoft Azure × Cognitive Services APIs Reference × +

westus.dev.cognitive.microsoft.com/docs/services/563879b61984550e40cbbe8d/operations/563879b61984550f30395236

Microsoft Cognitive Services

APIs Documentation > API Reference

Face

- POST** Detect
- POST** Find Similar
- POST** Group
- POST** Identify
- POST** Verify

FaceList

LargeFaceList

LargePersonGroup

LargePersonGroup Person

PersonGroup

PersonGroup Person

Snapshot

Face API - v1.0

This API is currently available in:

- Australia East - australiaeast.api.cognitive.microsoft.com
- Brazil South - brazilsouth.api.cognitive.microsoft.com
- Canada Central - canadacentral.api.cognitive.microsoft.com
- Central India - centralindia.api.cognitive.microsoft.com
- Central US - centralus.api.cognitive.microsoft.com
- East Asia - eastasia.api.cognitive.microsoft.com
- East US - eastus.api.cognitive.microsoft.com
- East US 2 - eastus2.api.cognitive.microsoft.com
- France Central - francecentral.api.cognitive.microsoft.com
- Japan East - japaneast.api.cognitive.microsoft.com
- Japan West - japanwest.api.cognitive.microsoft.com
- Korea Central - koreacentral.api.cognitive.microsoft.com
- North Central US - northcentralus.api.cognitive.microsoft.com
- North Europe - northeurope.api.cognitive.microsoft.com
- South Africa North - southafricanorth.api.cognitive.microsoft.com
- South Central US - southcentralus.api.cognitive.microsoft.com
- Southeast Asia - southeastasia.api.cognitive.microsoft.com
- UK South - uksouth.api.cognitive.microsoft.com
- West Central US - westcentralus.api.cognitive.microsoft.com
- West Europe - westeurope.api.cognitive.microsoft.com
- West US - westus.api.cognitive.microsoft.com
- West US 2 - westus2.api.cognitive.microsoft.com
- UAE North - uaenorth.api.cognitive.microsoft.com

Face - Detect

Detect human faces in an image, return face rectangles, and optionally with faceIds, landmarks, and attributes.

<https://westus.dev.cognitive.microsoft.com/docs/services/563879b61984550e40cbbe8d/operations/563879b61984550f30395236>

face-api-ai1006 - Microsoft Azure

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveSe... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > face-api-ai1006

face-api-ai1006 | Keys and Endpoint

Cognitive Services

Search (Ctrl+ /) Regenerate Key1 Regenerate Key2

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

- Quick start
- Keys and Endpoint**
- Pricing tier
- Networking
- Identity
- Billing By Subscription
- Properties
- Locks

Monitoring

- Alerts

Show Keys

KEY 1
..... 

KEY 2
..... 

Location ⓘ
brazilsouth 

Endpoint
<https://face-api-ai1006.cognitiveservices.azure.com/> 



Face API // Keys and Endpoints

face-api-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.CognitiveServices...

Microsoft Azure Upgrade Search resources, services, and docs (G+)

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face-api-ai1006 | Quick start

Cognitive Services

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Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

Quick start Keys and Endpoint Pricing tier Networking Identity Billing By Subscription Properties Locks Monitoring Alerts

Explore the Quickstart guidance to get up and running with Face.



1 Get the API Key and endpoint to authenticate your applications and start sending calls to the service.
All Face calls and docker container activations require a key. The key can be found in the Keys and Endpoint section in the left pane. Specify the key either in the request header (Web API), the Face client (SDK), or through the command-line (Docker container).

2 Try the service in the API console - requires API Key and selecting your location.
Use the API Console to quickly try the API without writing code. Be sure to select the correct location for this resource. The API key and the location can be found in the Keys and Endpoint section in the left tab.
[API Console](#)

3 Make a web API call - requires your API Key and endpoint
Use the sample code in these quickstarts to begin integrating Face into your applications to detect, recognize and analyze human faces in images
[C# Quickstart](#) [Python Quickstart](#)

Learn more about the APIs

<https://ao.microsoft.com/fwlink/?linkid=2109273>

Face API QuickStart

There are several different ways to write your code. This is just one of them.

```
import json, os, requests

subscription_key = "YOUR SUBSCRIPTION"
face_api_url = "YOUR ENDPOINT" + '/face/v1.0/detect'

image_url = 'https://raw.githubusercontent.com/Azure-Samples/cognitive-services-sample-data-files/master/ComputerVision/Images/faces.jpg'

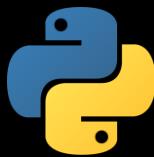
headers = {'Ocp-Apim-Subscription-Key': subscription_key}

params = {
    'detectionModel': 'detection_03',
    'returnFacelid': 'true'
}

response = requests.post(face_api_url, params=params,
                         headers=headers, json={"url": image_url})
print(json.dumps(response.json()))
```



The code



AIDI1006-face-detection.ipynb

Home Page - Select or create a n AIDI1006-face-detection - Jupyter cognitiveservices-caio - Microsoft

localhost:8888/notebooks/AIDI1006-face-detection.ipynb

jupyter AIDI1006-face-detection Last Checkpoint: 39 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [2]:

```
import json, os, requests

subscription_key = "950[REDACTED]1beb"
face_api_url = "https://[REDACTED].cognitiveservices.azure.com" + '/face/v1.0/detect'

image_url = 'https://raw.githubusercontent.com/Azure-Samples/cognitive-services-sample-data-files/master/ComputerVision/Images/face[REDACTED].jpg'

headers = {'Ocp-Apim-Subscription-Key': subscription_key}

params = {
    'detectionModel': 'detection_03',
    'returnFaceId': 'true'
}

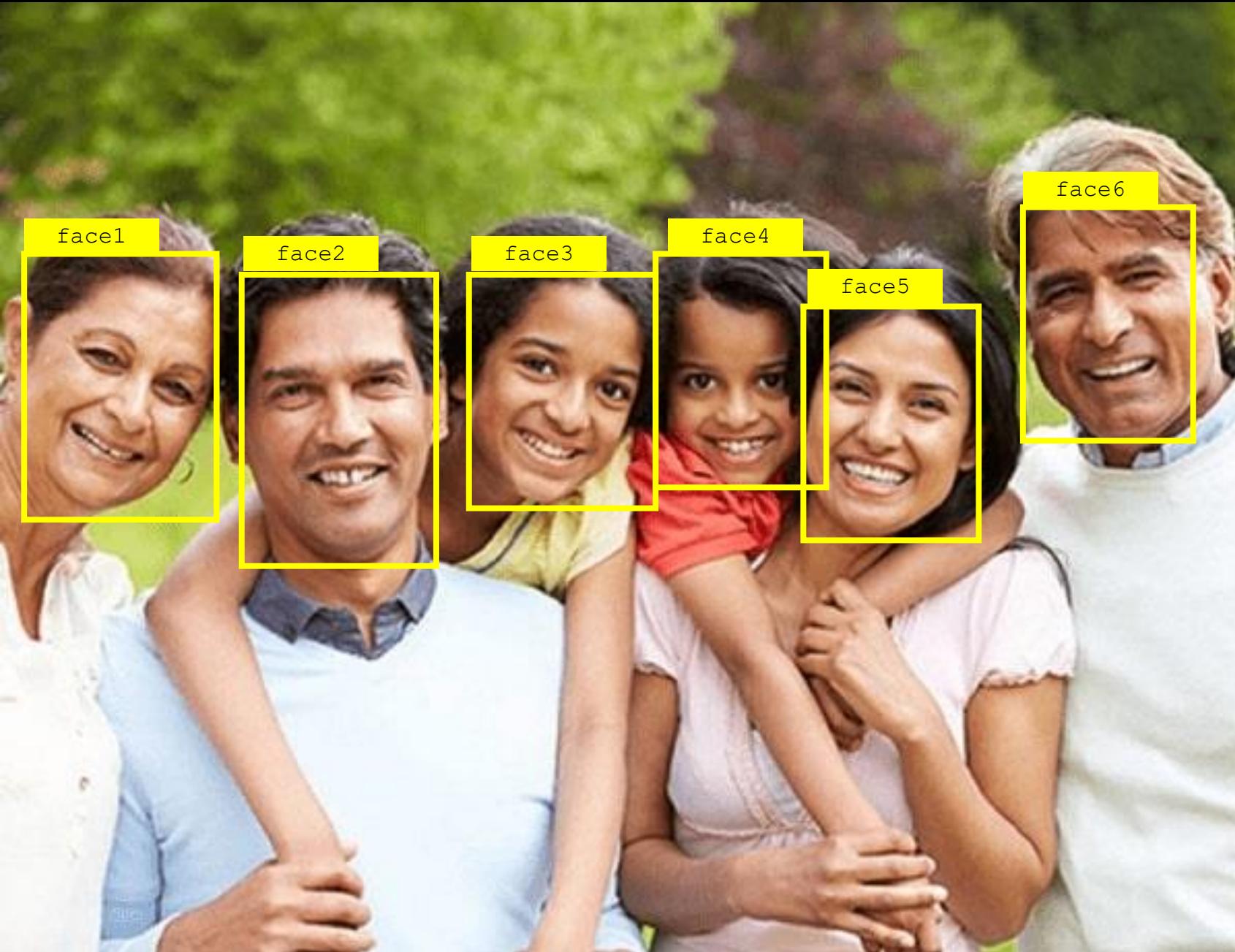
response = requests.post(face_api_url, params=params,
                         headers=headers, json={"url": image_url})
print(json.dumps(response.json()))
```

[{"faceId": "2715ba90-5d64-4c15-966d-69216ef33e36", "faceRectangle": {"top": 139, "left": 118, "width": 89, "height": 126}}, {"faceId": "66ab66d2-ba1a-4224-9b1a-93862f6ecc54", "faceRectangle": {"top": 95, "left": 494, "width": 92, "height": 115}}, {"faceId": "c1134d6c-d283-476b-b449-0c223bd0f3f3", "faceRectangle": {"top": 131, "left": 12, "width": 92, "height": 110}}, {"faceId": "5090fad2-fecb-4f2e-9ed8fea1e56ca615", "faceRectangle": {"top": 149, "left": 389, "width": 82, "height": 107}}, {"faceId": "7193b0a6-80f0-454c-9ee0-8023e339eef3", "faceRectangle": {"top": 136, "left": 226, "width": 83, "height": 104}}, {"faceId": "7fd0c4b-16f6-4740-b36d-c3230c57cd46", "faceRectangle": {"top": 143, "left": 320, "width": 68, "height": 90}}]

There are several different ways to write your code. This is just one of them.



AIDI1006-face-detection.ipynb



The result // 6 faces

Public-Domain Test Images for Homeworks and Projects

[Face recognition ORL database](#)

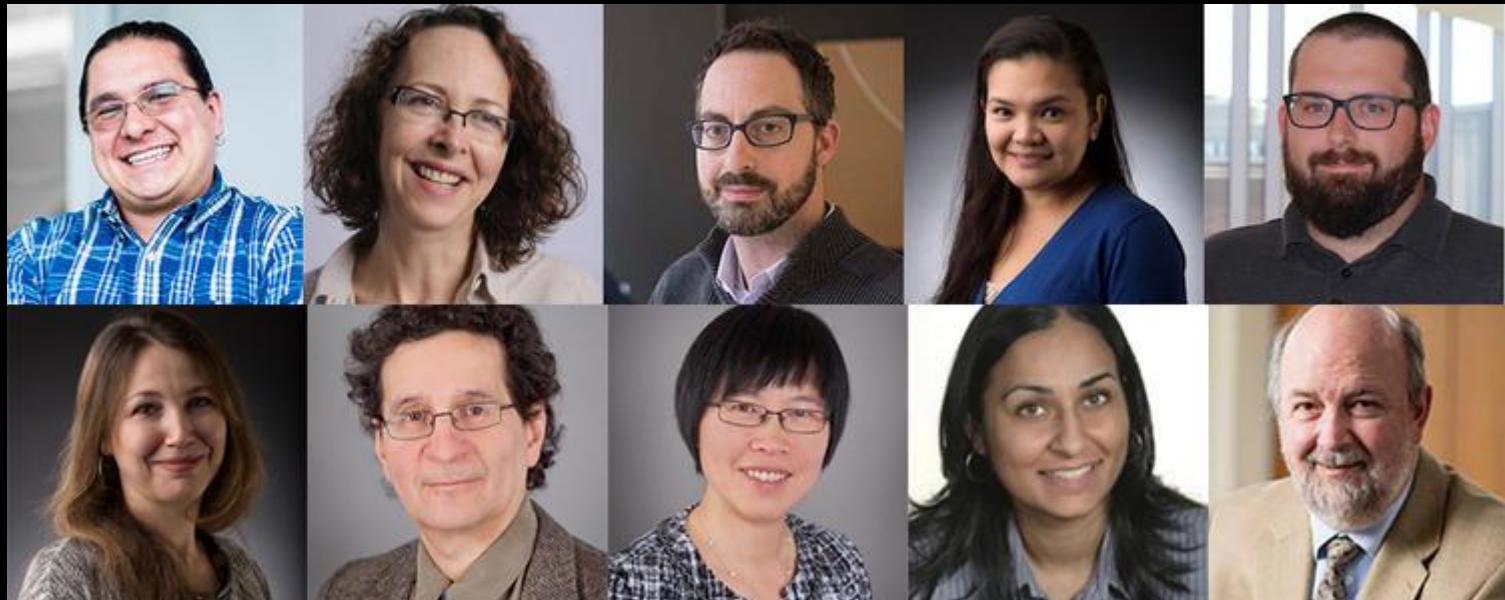
[Photo database provided by Fabien a. p. petitcolas](#)

Other images

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- [arctichare.png](#)
- [baboon.png](#)
- [barbara.bmp](#), [barbara.png](#)
- [boat.png](#)
- [boy.bmp](#), [boy.ppm](#)
- [cameraman.tif](#)
- [cat.png](#)
- [fprint3.pgm](#)
- [fruits.png](#)
- [frymire.png](#)
- [girl.png](#)
- [goldhill.bmp](#), [goldhill.png](#)
- [lena.bmp](#), [lenacolor.png](#), [lena.ppm](#), [Lenaclor.ppm](#)
- [monarch.png](#)
- [mountain.png](#), [mountain.bmp](#)
- [p64int.txt](#)
- [peppers.png](#)
- [pool.png](#)
- [sails.bmp](#), [sails.png](#)
- [serrano.png](#)
- [tulips.png](#)
- [us021.pgm](#)
- [us092.pgm](#)
- [watch.png](#)
- [zelda.png](#)



SCREENSHOT!



Analyse this file in the following address: <https://uwaterloo.ca/public-health-sciences/sites/ca.public-health-sciences/files/resize/uploads/images/sphhs-people-banner-2019-750x300.jpg>

AIDI1006-face-detection - Jupyter +

localhost:8888/notebooks/AIDI1006-face-detection.ipynb

jupyter AIDI1006-face-detection Last Checkpoint: 2 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [6]:

```
import json, os, requests

subscription_key = "950[REDACTED]1beb"
face_api_url = "https://cognitiveservices-caio.cognitiveservices.azure.com" + '/face/v1.0/detect'

image_url = 'https://uwaterloo.ca/public-health-sciences/sites/ca.public-health-sciences/files/resize/uploads/images/sphhs-people'

headers = {'Ocp-Apim-Subscription-Key': subscription_key}

params = {
    'detectionModel': 'detection_03',
    'returnFaceId': 'true'
}

response = requests.post(face_api_url, params=params,
                         headers=headers, json={"url": image_url})
print(json.dumps(response.json()))
```

The result...

SCREENSHOT!

There are several different ways to write your code. This is just one of them.

Challenge #4.9

Azure Cognitive Services

Computer Vision

Computer Vision // Describe + Categorize

Categorize an image

Identify and categorize an entire image, using a category taxonomy with parent/child hereditary hierarchies.

Categories can be used alone, or with our new tagging models.

Currently, English is the only supported language for tagging and categorizing images. Categorize an image

Describe an image

Generate a description of an entire image in human-readable language, using complete sentences. Computer Vision's algorithms generate various descriptions based on the objects identified in the image. The descriptions are each evaluated, and a confidence score generated. A list is then returned ordered from highest confidence score to lowest. Describe an image

Home Page - Select or create a n × wAIIDI1006-describe-categorize - × + localhost:8888/notebooks/wAIIDI1006-describe-categorize.ipynb

jupyter wAIIDI1006-describe-categorize (autosaved)

File Edit View Insert Cell Kernel Widgets Help

Code

```
# <snippet_describe>
...
Describe an Image - local
Description of local image:
'a group of people posing for a photo' with confidence 70.30%

===== Describe an image - remote =====
Description of remote image:
'a plane flying over snowy mountains' with confidence 53.50%

===== Categorize an Image - local =====
Categories from local image:
'people_group' with confidence 78.52%

===== Categorize an image - remote =====
Categories from remote image:
'sky_object' with confidence 79.69%
'others_' with confidence 0.78%
'outdoor' with confidence 0.78%
```

<snippet_categorize>
...
Categorize an Image - remote
This example extracts (general) categories from a remote image with a confidence score.
...
print("===== Categorize an image - remote =====")
Select the visual feature(s) you want.
remote_image_features = ["categories"]
Call API with URL and features
categorize_results_remote = computervision_client.analyze_image(remote_image_url , remote_image_features)

Print results with confidence score
print("Categories from remote image: ")
if (len(categorize_results_remote.categories) == 0):
 print("No categories detected.")
else:
 for category in categorize_results_remote.categories:
 print("{}'{}' with confidence {:.2f}%".format(category.name, category.score * 100))
</snippet_categorize>
print()

There are several different ways to write your code. This is just one of them.



Results // Describe and categorize // REMOTE + LOCAL FILES



File Edit View Insert Cell Kernel Widgets Help Trusted | Python 3

```
In [3]: from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from azure.cognitiveservices.vision.computervision.models import OperationStatusCodes
from azure.cognitiveservices.vision.computervision.models import VisualFeatureTypes
from msrest.authentication import CognitiveServicesCredentials

from array import array
import os
from PIL import Image
import sys
import time

subscription_key = "6[REDACTED]a72"
endpoint = "https://[REDACTED]eservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))

# Quickstart variables // These variables are shared by several examples
#images_folder = os.path.join(os.path.dirname(os.path.abspath(__file__)), "images")
images_folder = "C:\\images"
remote_image_url = "https://homepages.cae.wisc.edu/~ece533/images/airplane.png"

print("===== Describe an Image - local =====")
# Open Local image file
local_image_path = os.path.join(images_folder, "people.jpg")
local_image = open(local_image_path, "rb")

# Call API
description_result = computervision_client.describe_image_in_stream(local_image)

# Get the captions (descriptions) from the response, with confidence level
print("Description of local image: ")
if (len(description_result.captions) == 0):
    print("No description detected.")
else:
    for caption in description_result.captions:
        print('{0} with confidence {1:.2f}%'.format(caption.text, caption.confidence * 100))
print()
```
END - Describe an Image - local
```



## jupyter wAIDI1006-describe-categorize Last Checkpoint: 3 minutes ago (autosaved)



Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3



```
===== Describe an Image - local =====
Open local image file
local_image_path = os.path.join (images_folder, "people.jpg")
local_image = open(local_image_path, "rb")

Call API
description_result = computervision_client.describe_image_in_stream(local_image)

Get the captions (descriptions) from the response, with confidence level
print("Description of local image: ")
if (len(description_result.captions) == 0):
 print("No description detected.")
else:
 for caption in description_result.captions:
 print("{} with confidence {:.2f}%".format(caption.text, caption.confidence * 100))
print()
'''

END - Describe an Image - local
'''

'''

Describe an Image - remote
This example describes the contents of an image with the confidence score.
'''

print("===== Describe an image - remote =====")
Call API
description_results = computervision_client.describe_image(remote_image_url)

Get the captions (descriptions) from the response, with confidence Level
print("Description of remote image: ")
if (len(description_results.captions) == 0):
 print("No description detected.")
else:
 for caption in description_results.captions:
 print("{} with confidence {:.2f}%".format(caption.text, caption.confidence * 100))
</snippet_describe>
print()
'''

END - Describe an Image - remote
'''
```



Home Page - Select or create a n × wAIDI1006-describe-categorize × +

localhost:8888/notebooks/wAIDI1006-describe-categorize.ipynb

jupyter wAIDI1006-describe-categorize Last Checkpoint: 4 minutes ago (unsaved changes) Logout Trusted Python 3

```
...
Categorize an Image - local
This example extracts categories from a local image with a confidence score
...
print("===== Categorize an Image - local =====")
Open local image file
local_image = open(local_image_path, "rb")
Select visual feature type(s)
local_image_features = ["categories"]
Call API
categorize_results_local = computervision_client.analyze_image_in_stream(local_image, local_image_features)
Print category results with confidence score
print("Categories from local image: ")
if (len(categorize_results_local.categories) == 0):
 print("No categories detected.")
else:
 for category in categorize_results_local.categories:
 print("{} with confidence {:.2f}%".format(category.name, category.score * 100))
print()
END - Categorize an Image - local
...
...
Categorize an Image - remote
This example extracts (general) categories from a remote image with a confidence score.
...
print("===== Categorize an image - remote =====")
Select the visual features you want.
remote_image_features = ["categories"]
Call API with URL and features
categorize_results_remote = computervision_client.analyze_image(remote_image_url , remote_image_features)
Print results with confidence score
print("Categories from remote image: ")
if (len(categorize_results_remote.categories) == 0):
 print("No categories detected.")
else:
 for category in categorize_results_remote.categories:
 print("{} with confidence {:.2f}%".format(category.name, category.score * 100))
print()
===== Describe an Image - local =====
Description of local image:
```

The code // Analyze Method

AIDI1006-describe-categorize



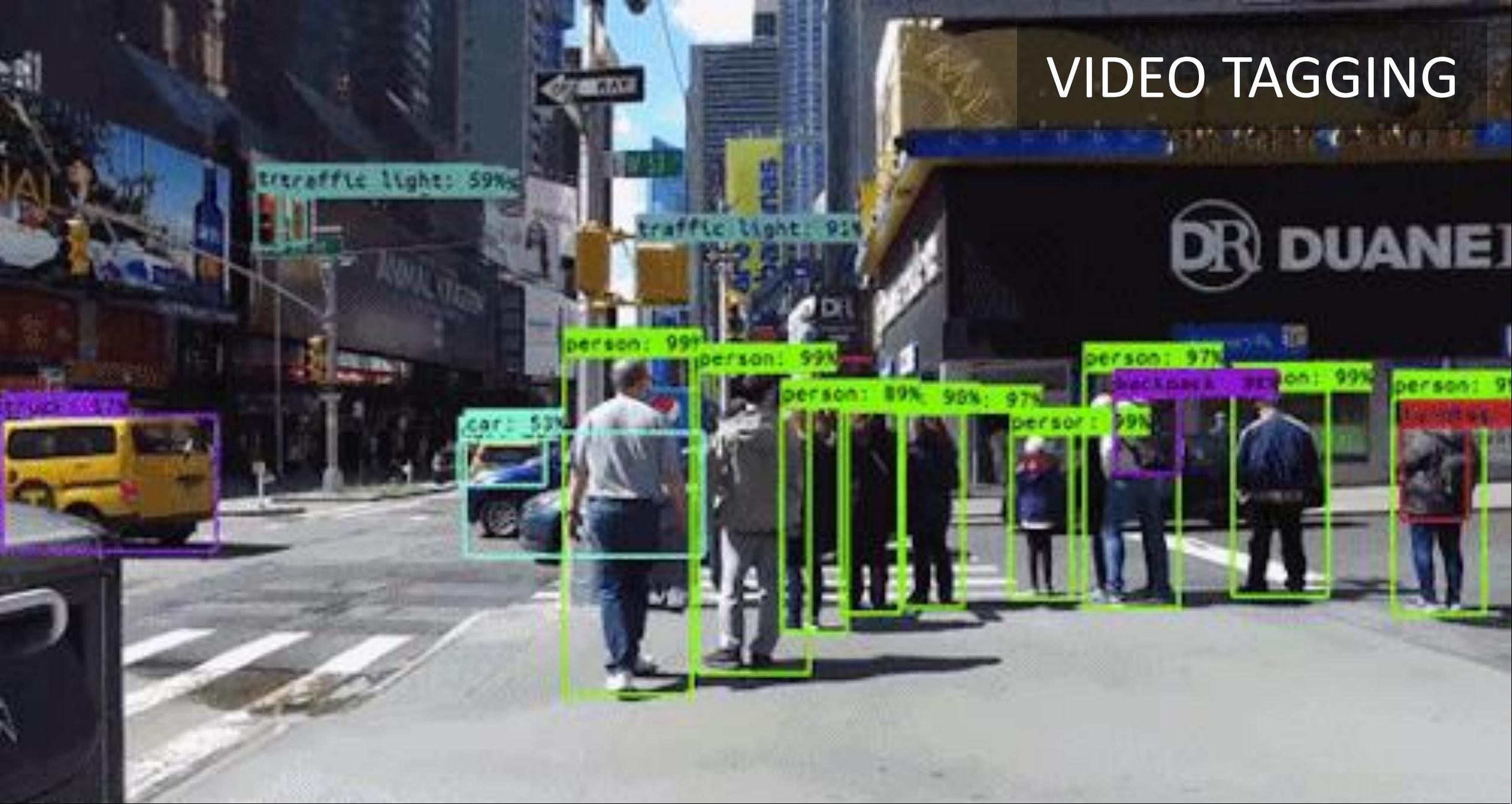
SCREENSHOT!

## Your Turn!

Using cognitive services, write your code to analyse your preferred local file (image) and an URL image.

Take a screenshot of your result and add the local image and the URL image.

# VIDEO TAGGING



Example

## **Computer Vision // Image Tagging // REMOTE**

Computer vision returns tags based on thousands of recognizable objects, living beings, scenery and actions.

After uploading an image or specifying an image URL, Computer Vision algorithms output tags based on the objects, living beings, and actions identified in the image.

File Edit View Navigate Code Refactor Run Tools VCS Window Help image-tagging - main.py

image-tagging > main.py

Project main.py

```
from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from msrest.authentication import CognitiveServicesCredentials
Authenticate // Authenticates your credentials and creates a client.
subscription_key = "66e[REDACTED]8a72"
endpoint = "https://[REDACTED].cognitiveservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))

remote_image_url = "https://health.gov/sites/default/files/styles/max_650x650/public/2020-12/HP2030-LHI.jpg?itok=0rf0g4kM"

Tag an Image - remote // This example returns a tag (key word) for each thing in the image.
print("===== Tag an image - remote =====")
Call API with remote image
tags_result_remote = computervision_client.tag_image(remote_image_url)
Print results with confidence score
print("Tags in the remote image: ")
if __name__ == '__main__':
 pass
```

Run: main

C:\Users\caio\PycharmProjects\image-tagging\venv\Scripts\python.exe C:/Users/caio/PycharmProjects/image-tagging/main.py

===== Tag an image - remote =====

Tags in the remote image:

- 'clothing' with confidence 99.95%
- 'person' with confidence 99.90%
- 'human face' with confidence 99.74%
- 'outdoor' with confidence 99.47%
- 'smile' with confidence 90.81%
- 'people' with confidence 86.09%
- 'mammal' with confidence 84.10%
- 'woman' with confidence 74.32%
- 'standing' with confidence 72.33%
- 'street' with confidence 58.61%

Process finished with exit code 0

There are several different ways to write your code. This is just one of them.



AIDI1006 - image-tagging

<https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/quickstarts-sdk/image-analysis-client-library?tabs=visual-studio&pivots=programming-language-python>

===== Tag an image - remote =====

Tags in the remote image:

'clothing' with confidence 99.95%

'person' with confidence 99.90%

'human face' with confidence 99.74%

'outdoor' with confidence 99.47%

'smile' with confidence 90.81%

'people' with confidence 86.09%

'mammal' with confidence 84.10%

'woman' with confidence 74.32%

'standing' with confidence 72.33%

'street' with confidence 58.61%



AIDI1006 - image-tagging - Jupyter

localhost:8888/notebooks/AIDI1006%20-%20image-tagging.ipynb

jupyter AIDI1006 - image-tagging Last Checkpoint: Last Wednesday at 3:39 PM (unsaved changes)

File Edit View Insert Cell Kernel Widgets Help

Not Trusted | Python 3

In [1]:

```
from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from msrest.authentication import CognitiveServicesCredentials
Authenticate // Authenticates your credentials and creates a client.
subscription_key = "66e[REDACTED]Ba72"
endpoint = "https://[REDACTED].cognitiveservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))
remote_image_url = "https://health.gov/sites/default/files/styles/max_650x650/public/2020-12/HP2030-LHI.jpg?itok=OrfQg4kM"
Tag an Image - remote // This example returns a tag (key word) for each thing in the image.
print("===== Tag an image - remote =====")
call API with remote image
tags_result_remote = computervision_client.tag_image(remote_image_url)
Print results with confidence score
print("Tags in the remote image: ")
if (len(tags_result_remote.tags) == 0):
 print("No tags detected.")
else:
 for tag in tags_result_remote.tags:
 print("{} with confidence {:.2f}%".format(tag.name, tag.confidence * 100))
```

===== Tag an image - remote =====

Tags in the remote image:

- 'clothing' with confidence 99.95%
- 'person' with confidence 99.90%
- 'human face' with confidence 99.74%
- 'outdoor' with confidence 99.47%
- 'smile' with confidence 90.81%
- 'people' with confidence 86.09%
- 'mammal' with confidence 84.10%
- 'woman' with confidence 74.32%
- 'standing' with confidence 72.33%
- 'street' with confidence 58.61%

There are several different ways to write your code. This is just one of them.



[https://health.gov/sites/default/files/styles/max\\_650x650/public/2020-12/HP2030-LHI.jpg?itok=OrfQg4kM](https://health.gov/sites/default/files/styles/max_650x650/public/2020-12/HP2030-LHI.jpg?itok=OrfQg4kM)

## **Computer Vision // Image Tagging // LOCAL**

Computer vision returns tags based on thousands of recognizable objects, living beings, scenery and actions.

After uploading an image or specifying an image URL, Computer Vision algorithms output tags based on the objects, living beings, and actions identified in the image.

Home Page - Select or create a n × wAIIDI1006-full\_file - Jupyter Notebooks +

localhost:8888/notebooks/wAIIDI1006-full\_file.ipynb

jupyter wAIIDI1006-full\_file (autosaved) Logout Trusted Python 3

File Edit View Insert Cell Kernel Widgets Help

Tag an Image - local  
This example returns a tag (key word) for each thing in the image.  
...  
print("===== Tag an Image - local =====")  
# Open Local image file  
local\_image = open(local\_image\_path, "r")  
# Call API local image  
tags\_result\_local = computervision\_client.tag\_image\_in\_stream(local\_image)  
  
# Print results with confidence score  
print("Tags in the local image: ")  
if len(tags\_result\_local.tags) == 0:  
 print("No tags detected.")  
else:  
 for tag in tags\_result\_local.tags:  
 print("{}' with confidence {:.2f}%".format(tag.name, tag.confidence \* 100))  
print()  
...  
END - Tag an Image - local  
...  
# <snippet\_tags>  
Tag an Image - remote  
This example returns a tag (key word) for each thing in the image.  
...  
print("===== Tag an Image - remote =====")  
# Call API with remote image  
tags\_result\_remote = computervision\_client.tag\_image(remote\_image\_url )  
  
# Print results with confidence score  
print("Tags in the remote image: ")  
if len(tags\_result\_remote.tags) == 0:  
 print("No tags detected.")  
else:  
 for tag in tags\_result\_remote.tags:  
 print("{}' with confidence {:.2f}%".format(tag.name, tag.confidence \* 100))  
# </snippet\_tags>  
print()  
...  
END - Tag an Image - remote  
...  
Local method: tag\_image\_in\_stream // Remote method: tag\_image



## Your Turn!

Using cognitive services, write your code to analyse the following URL and the following local file. URL:

[https://wp.en.aleteia.org/wp-content/uploads/sites/2/2020/05/web3-family-large-big-home-brother-sister-mother-father-shutterstock\\_1197877477.jpg?w=640&crop=1](https://wp.en.aleteia.org/wp-content/uploads/sites/2/2020/05/web3-family-large-big-home-brother-sister-mother-father-shutterstock_1197877477.jpg?w=640&crop=1)

Local: C:\images\happy-family.jpg

AIDI1006 - image-tagging - Jupyter

localhost:8888/notebooks/AIDI1006%20-%20image-tagging.ipynb

jupyter AIDI1006 - image-tagging Last Checkpoint: Last Wednesday at 3:39 PM (unsaved changes)

File Edit View Insert Cell Kernel Widgets Help Not Trusted Python 3

In [1]:

```
from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from msrest.authentication import CognitiveServicesCredentials
Authenticate // Authenticates your credentials and creates a client.
subscription_key = "66d[REDACTED]Ba72"
endpoint = "https://[REDACTED].cognitiveservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))
remote_image_url = "https://health.gov/sites/default/files/styles/max_650x650/public/2020-12/HP2030-LHI.jpg?itok=OrfQg4kM"
Tag an Image - remote // This example returns a tag (key word) for each thing in the image.
print("===== Tag an image - remote =====")
call API with remote image
tags_result_remote = computervision_client.tag_image(remote_image_url)
Print results with confidence score
print("Tags in the remote image: ")
if (len(tags_result_remote.tags) == 0):
 print("No tags detected.")
else:
 for tag in tags_result_remote.tags:
 print("{} with confidence {:.2f}%".format(tag.name, tag.confidence * 100))
```

===== Tag an image - remote =====

Tags in the remote image:

- 'clothing' with confidence 99.95%
- 'person' with confidence 99.90%
- 'human face' with confidence 99.74%
- 'outdoor' with confidence 99.47%
- 'smile' with confidence 90.81%
- 'people' with confidence 86.09%
- 'mammal' with confidence 84.10%
- 'woman' with confidence 74.32%
- 'standing' with confidence 72.33%
- 'street' with confidence 58.61%

There are several different ways to write your code. This is just one of them.



Results // REMOTE

# **Computer Vision // Domain Specific Models**

**Moderate Content**

**Detect Adult or Racy Content**



File Edit View Insert Cell Kernel Widgets Help  
New Run Cell Code Cell

Trusted | Python 3

In [1]

```
from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from azure.cognitiveservices.vision.computervision.models import OperationStatusCodes
from azure.cognitiveservices.vision.computervision.models import VisualFeatureTypes
from msrest.authentication import CognitiveServicesCredentials

from array import array
import os
from PIL import Image
import sys
import time

subscription_key = "6d[REDACTED]72"
endpoint = "https://cq[REDACTED].cognitiveservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))

local_image_path = "C:\images\kim.jpg"
remote_image_url = "https://earlybirdcatchestheworm.files.wordpress.com/2015/08/cosmo-september-15-demi-lovato-newsstand.jpg"
...
```

Detect Adult or Racy Content - local  
This example detects adult or racy content in a local image, then prints the adult/racy score.  
The score is ranged 0.0 - 1.0 with smaller numbers indicating negative results.

```
...
print("===== Detect Adult or Racy Content - local =====")
Open Local file
local_image = open(local_image_path, "rb")
Select visual features you want
local_image_features = ["adult"]
Call API with local image and features
detect_adult_results_local = computervision_client.analyze_image_in_stream(local_image, local_image_features)

Print results with adult/racy score
print("Analyzing local image for adult or racy content ... ")
print("Is adult content: {} with confidence {:.2f}".format(detect_adult_results_local .adult.is_adult_content, detect_adult_results_local .adult.confidence))
print("Has racy content: {} with confidence {:.2f}".format(detect_adult_results_local .adult.is_racy_content, detect_adult_results_local .adult.confidence))
print()
END - Detect Adult or Racy Content - Local
```

...
Detect Adult or Racy Content - remote  
This example detects adult or racy content in a remote image, then prints the adult/racy score.  
The score is ranged 0.0 - 1.0 with smaller numbers indicating negative results.





Logout

jupyter wAIIDI1006-moderate-content Last Checkpoint: Last Thursday at 10:41 AM (autosaved)

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

```
local_image_path = "C:\images\kim.jpg"
remote_image_url = "https://cognitiveservices.blob.core.windows.net/computer-vision-test-images/2015/09/cosmo-september-15-day-19-santa-newsstand.jpg"

...
Detect Adult or Racy Content - local
This example detects adult or racy content in a local image, then prints the adult/racy score.
The score is ranged 0.0 - 1.0 with smaller numbers indicating negative results.
"""
print("===== Detect Adult or Racy Content - local =====")
Open local file
local_image = open(local_image_path, "rb")
Select visual features you want
local_image_features = ["adult"]
Call API with local image and features
detect_adult_results_local = computervision_client.analyze_image_in_stream(local_image, local_image_features)

Print results with adult/racy score
print("Analyzing local image for adult or racy content ... ")
print("Is adult content: {} with confidence {:.2f}".format(detect_adult_results_local .adult.is_adult_content, detect_adult_results_local .adult.confidence))
print("Has racy content: {} with confidence {:.2f}".format(detect_adult_results_local .adult.is_racy_content, detect_adult_results_local .adult.confidence))
print()
END - Detect Adult or Racy Content - Local

...

Detect Adult or Racy Content - remote
This example detects adult or racy content in a remote image, then prints the adult/racy score.
The score is ranged 0.0 - 1.0 with smaller numbers indicating negative results.
"""
print("===== Detect Adult or Racy Content - remote =====")
Select the visual feature(s) you want
remote_image_features = ["adult"]
Call API with URL and features
detect_adult_results_remote = computervision_client.analyze_image(remote_image_url, remote_image_features)

Print results with adult/racy score
print("Analyzing remote image for adult or racy content ... ")
print("Is adult content: {} with confidence {:.2f}".format(detect_adult_results_remote.adult.is_adult_content, detect_adult_results_remote.adult.confidence))
print("Has racy content: {} with confidence {:.2f}".format(detect_adult_results_remote.adult.is_racy_content, detect_adult_results_remote.adult.confidence))
</snippet_adult>
print()
END - Detect Adult or Racy Content - Remote
```



AIDI1006-moderate-  
content.ipynb

jupyter AIDI1006-moderate-content Last Checkpoint: a few seconds ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

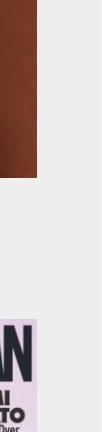
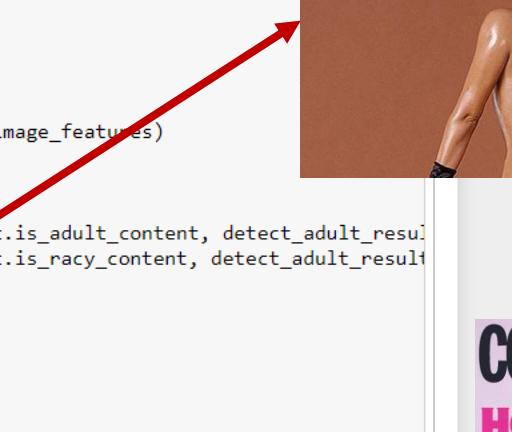
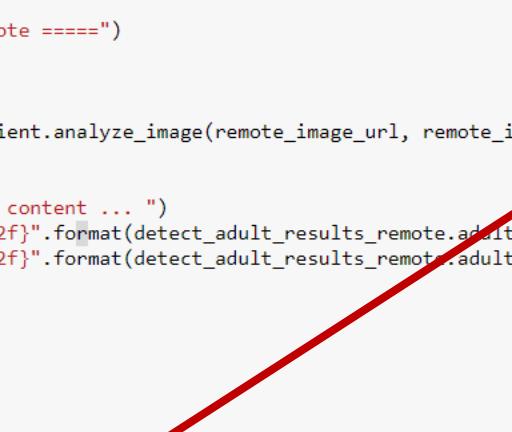
Code

```
...
Detect Adult or Racy Content - remote
This example detects adult or racy content in a remote image, then prints the adult/racy score.
The score is ranged 0.0 - 1.0 with smaller numbers indicating negative results.
...
print("===== Detect Adult or Racy Content - remote =====")
Select the visual feature(s) you want
remote_image_features = ["adult"]
Call API with URL and features
detect_adult_results_remote = computervision_client.analyze_image(remote_image_url, remote_image_features)

Print results with adult/racy score
print("Analyzing remote image for adult or racy content ...")
print("Is adult content: {} with confidence {:.2f}{}".format(detect_adult_results_remote.is_adult_content, detect_adult_results_remote.adult_confidence))
print("Has racy content: {} with confidence {:.2f}{}".format(detect_adult_results_remote.is_racy_content, detect_adult_results_remote.racy_confidence))
</snippet_adult>
print()
END - Detect Adult or Racy Content - remote
```

In [ ]:

===== Detect Adult or Racy Content - local =====  
Analyzing local image for adult or racy content ...  
Is adult content: False with confidence 9.16  
Has racy content: True with confidence 96.98  
  
===== Detect Adult or Racy Content - remote =====  
Analyzing remote image for adult or racy content ...  
Is adult content: False with confidence 1.74  
Has racy content: False with confidence 68.11

AIDI1006-moderate-  
content.ipynb



SCREENSHOT!

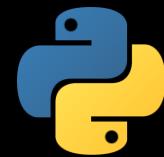
## Your Turn!

Using cognitive services, write your code to analyse your preferred local file (image) and an URL image.

Take a screenshot of your result and add the local image and the URL image.

# Computer Vision // Domain Specific Models

## Celebrities and Landmarks



AIDI1006-landmark-  
celeb.ipynb



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```
In [1]: from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from azure.cognitiveservices.vision.computervision.models import OperationStatusCodes
from azure.cognitiveservices.vision.computervision.models import VisualFeatureTypes
from msrest.authentication import CognitiveServicesCredentials

from array import array
import os
from PIL import Image
import sys
import time

subscription_key = "66[REDACTED]8a72"
endpoint = "https://co[REDACTED]veservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))

Quickstart variables // These variables are shared by several examples
#images_folder = os.path.join(os.path.dirname(os.path.abspath(__file__)), "images")
images_folder = "C:\images"

local_landmark_path = "c:\images\landmark7.jpg"
local_celeb_path = "c:\images\celeb.jpg"

...
Detect Domain-specific Content - local
This example detects celebrites and landmarks in local images.
...
print("===== Detect Domain-specific Content - local =====")
Open local image file containing a celebtry
local_image = open(local_celeb_path, "rb")
Call API with the type of content (celebrities) and local image
detect_domain_results_celebs_local = computervision_client.analyze_image_by_domain_in_stream("celebrities", local_image)

Print which celebrities (if any) were detected
print("Celebrities in the local image:")
if len(detect_domain_results_celebs_local.result["celebrities"]) == 0:
 print("No celebrities detected.")
else:
 for celeb in detect_domain_results_celebs_local.result["celebrities"]:
```



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```
...
...
Detect Domain-specific Content - local
This example detects celebrites and landmarks in local images.
...
print("===== Detect Domain-specific Content - local =====")
Open Local image file containing a celebtry
local_image = open(local_image_path, "rb")
Call API with the type of content (celebrities) and local image
detect_domain_results_celebs_local = computervision_client.analyze_image_by_domain_in_stream("celebrities", local_image)

Print which celebrities (if any) were detected
print("Celebrities in the local image:")
if len(detect_domain_results_celebs_local.result["celebrities"]) == 0:
 print("No celebrities detected.")
else:
 for celeb in detect_domain_results_celebs_local.result["celebrities"]:
 print(celeb["name"])

Open local image file containing a landmark
local_image_path_landmark = os.path.join(images_folder, "landmark.jpg")
local_image_landmark = open(local_image_path_landmark, "rb")
Call API with type of content (landmark) and local image
detect_domain_results_landmark_local = computervision_client.analyze_image_by_domain_in_stream("landmarks", local_image_landmark)
print()

Print results of Landmark detected
print("Landmarks in the local image:")
if len(detect_domain_results_landmark_local.result["landmarks"]) == 0:
 print("No landmarks detected.")
else:
 for landmark in detect_domain_results_landmark_local.result["landmarks"]:
 print(landmark["name"])
print()
...
END - Detect Domain-specific Content - local
...
<snippet_celebs>
...

```



AIDI1006-landmark-celeb.ipynb

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```
"""
<snippet_celebs>
"""
Detect Domain-specific Content - remote
This example detects celebrites and landmarks in remote images.
"""

print("===== Detect Domain-specific Content - remote =====")
URL of one or more celebrities
remote_image_url_celebs = "https://raw.githubusercontent.com/Azure-Samples/cognitive-services-sample-data-files/master/ComputerVision/Images/celebrities.jpg"
Call API with content type (celebrities) and URL
detect_domain_results_celebs_remote = computervision_client.analyze_image_by_domain("celebrities", remote_image_url_celebs)

Print detection results with name
print("Celebrities in the remote image:")
if len(detect_domain_results_celebs_remote.result["celebrities"]) == 0:
 print("No celebrities detected.")
else:
 for celeb in detect_domain_results_celebs_remote.result["celebrities"]:
 print(celeb["name"])
</snippet_celebs>

<snippet_Landmarks>
"""
Call API with content type (landmarks) and URL
detect_domain_results_landmarks = computervision_client.analyze_image_by_domain("landmarks", remote_image_url)
print()

print("Landmarks in the remote image:")
if len(detect_domain_results_landmarks.result["landmarks"]) == 0:
 print("No landmarks detected.")
else:
 for landmark in detect_domain_results_landmarks.result["landmarks"]:
 print(landmark["name"])
</snippet_Landmarks>
print()
"""

END - Detect Domain-specific Content - remote
"""

Detect Image Types - local
```



AIDI1006-landmark-celeb.ipynb

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jupyter wAIDI1006-landmark-celeb (unsaved changes)

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local\_image = open(local\_celeb\_path, "rb")  
# Call API with the type of content (celebrities) and local image  
detect\_domain\_results\_celebs\_local = computervision\_client.analyze\_image\_by\_domain\_in\_stream("celebrities", local\_image)  
  
# Print which celebrities (if any) were detected  
print("Celebrities in the local image:")  
if len(detect\_domain\_results\_celebs\_local.result["celebrities"]) == 0:  
 print("No celebrities detected.")  
else:  
 for celeb in detect\_domain\_results\_celebs\_local.result["celebrities"]:  
 print(celeb["name"])  
  
# Open Local image file containing a Landmark  
local\_image\_path\_landmark = os.path.join(images\_folder, "landmark2.jpeg")  
local\_image\_landmark = open(local\_landmark\_path, "rb")  
# Call API with type of content (landmark) and local image  
detect\_domain\_results\_landmark\_local = computervision\_client.analyze\_image\_by\_domain\_in\_stream("landmarks", local\_image\_landmark)  
print()  
  
# Print results of Landmark detected  
print("Landmarks in the local image:")  
if len(detect\_domain\_results\_landmark\_local.result["landmarks"]) == 0:  
 print("No landmarks detected.")  
else:  
 for landmark in detect\_domain\_results\_landmark\_local.result["landmarks"]:  
 print(landmark["name"])  
print()

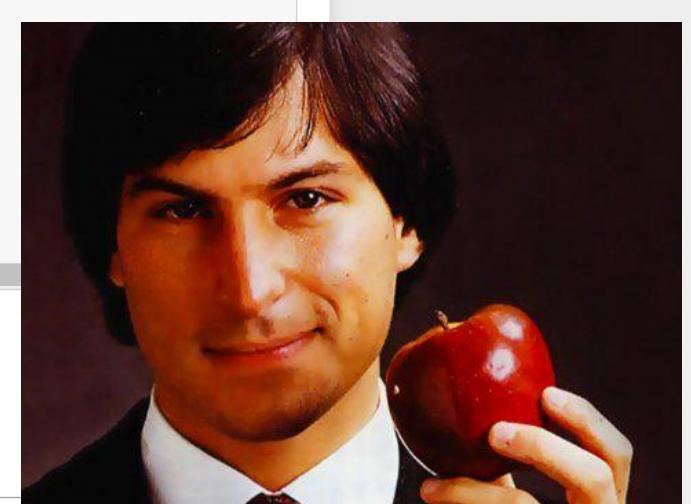
===== Detect Domain-specific Content - local =====

Celebrities in the local image:  
Steve Jobs

Landmarks in the local image:  
Taj Mahal

In [ ]:

A photograph of the Taj Mahal in Agra, India, showing the white marble mausoleum with its central dome and four smaller minarets, reflected perfectly in the clear blue water of the reflecting pool in front of it.

A portrait of Steve Jobs, co-founder of Apple, smiling and holding a red apple in his right hand. He is wearing a dark suit and tie.

AIDI1006-landmark-celeb.ipynb



SCREENSHOT!

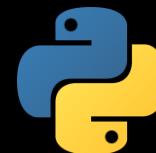
## Your Turn!

Using cognitive services, write your code to analyse your preferred local file (image) and an URL image.

Take a screenshot of your result and add the local image and the URL image.

# Computer Vision // Domain Specific Models

Brands



AIDI1006-brands.ipynb

jupyter wAIID1006-brands (unsaved changes)



Logout

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```
In [1]: from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from azure.cognitiveservices.vision.computervision.models import OperationStatusCodes
from azure.cognitiveservices.vision.computervision.models import VisualFeatureTypes
from msrest.authentication import CognitiveServicesCredentials

from array import array
import os
from PIL import Image
import sys
import time

subscription_key = "66e81584f4914a38a0f627b3ee888a72"
endpoint = "https://computer-vision-caio.cognitiveservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))

Quickstart variables // These variables are shared by several examples
#images_folder = os.path.join(os.path.dirname(os.path.abspath(__file__)), "images")
images_folder = "C:\images"
```

...  
Detect Brands - local  
This example detects common brands like logos and puts a bounding box around them.

```
print("===== Detect Brands - local =====")
Open image file
local_image_path_shirt = os.path.join(images_folder, "gray-shirt-logo.jpg")
local_image_shirt = open(local_image_path_shirt, "rb")
Select the visual feature(s) you want
local_image_features = ["brands"]
Call API with image and features
detect_brands_results_local = computervision_client.analyze_image_in_stream(local_image_shirt, local_image_features)

Print detection results with bounding box and confidence score
print("Detecting brands in local image: ")
if len(detect_brands_results_local.brands) == 0:
 print("No brands detected.")
else:
```



AIDI1006-brands.ipynb

## jupyter wAIIDI1006-brands (unsaved changes)



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```
Quickstart variables // These variables are shared by several examples
#images_folder = os.path.join (os.path.dirname(os.path.abspath(__file__)), "images")
images_folder = "C:\images"

...
Detect Brands - local
This example detects common brands like logos and puts a bounding box around them.
...
print("===== Detect Brands - local =====")
Open image file
local_image_path_shirt = os.path.join (images_folder, "gray-shirt-logo.jpg")
local_image_shirt = open(local_image_path_shirt, "rb")
Select the visual feature(s) you want
local_image_features = ["brands"]
Call API with image and features
detect_brands_results_local = computervision_client.analyze_image_in_stream(local_image_shirt, local_image_features)

Print detection results with bounding box and confidence score
print("Detecting brands in local image: ")
if len(detect_brands_results_local.brands) == 0:
 print("No brands detected.")
else:
 for brand in detect_brands_results_local.brands:
 print("{}' brand detected with confidence {:.1f}% at location {}, {}, {}, {}".format(\
 brand.name, brand.confidence * 100, brand.rectangle.x, brand.rectangle.x + brand.rectangle.w, \
 brand.rectangle.y, brand.rectangle.y + brand.rectangle.h))
 print()
...
END - Detect brands - local
...

<snippet_brands>
...
Detect Brands - remote
This example detects common brands like logos and puts a bounding box around them.
...
print("===== Detect Brands - remote =====")
Get a URL with a brand logo
remote_image_url = "https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/images/gray-shirt-l
```



AIDI1006-brands.ipynb

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```
 brand.rectangle.y, brand.rectangle.y + brand.rectangle.h))
print()
...
END - Detect brands - local
...

<snippet_brands>
Detect Brands - remote
This example detects common brands like logos and puts a bounding box around them.
...
print("===== Detect Brands - remote =====")
Get a URL with a brand logo
remote_image_url = "https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/images/gray-shirt-logo.jpg"
Select the visual feature(s) you want
remote_image_features = ["brands"]
Call API with URL and features
detect_brands_results_remote = computervision_client.analyze_image(remote_image_url, remote_image_features)

print("Detecting brands in remote image: ")
if len(detect_brands_results_remote.brands) == 0:
 print("No brands detected.")
else:
 for brand in detect_brands_results_remote.brands:
 print("{}' brand detected with confidence {:.1f}% at location {}, {}, {}, {}".format(\
 brand.name, brand.confidence * 100, brand.rectangle.x, brand.rectangle.x + brand.rectangle.w, \
 brand.rectangle.y, brand.rectangle.y + brand.rectangle.h))
</snippet_brands>
print()

===== Detect Brands - local =====
Detecting brands in local image:
'Tommy Hilfiger' brand detected with confidence 69.1% at location 215, 254, 146, 172

===== Detect Brands - remote =====
Detecting brands in remote image:
'Microsoft' brand detected with confidence 62.5% at location 58, 113, 106, 152
'Microsoft' brand detected with confidence 69.8% at location 58, 260, 86, 149
```



AIDI1006-brands.ipynb

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```
END - Detect brands - local
...
<snippet_brands>
...
Detect Brands - remote
This example detects common brands like logos and puts a bounding box around them.
...
print("===== Detect Brands - remote =====")
Get a URL with a brand logo
remote_image_url = "https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/images/gray-shirt-logo.jpg"
Select the visual feature(s) you want
remote_image_features = ["brands"]
Call API with URL and features
detect_brands_results_remote = computervision_client.analyze_image(remote_image_url, remote_image_features)

print("Detecting brands in remote image: ")
if len(detect_brands_results_remote.brands) == 0:
 print("No brands detected.")
else:
 for brand in detect_brands_results_remote.brands:
 print("{}' brand detected with confidence {:.1f}% at location {}, {}, {}, {}.".format(\
 brand.name, brand.confidence * 100, brand.rectangle.x, brand.rectangle.x + brand.rectangle.w, \
 brand.rectangle.y, brand.rectangle.y + brand.rectangle.h))
</snippet_brands>
print()
```

```
===== Detect Brands - local =====
Detecting brands in local image:
'Tommy Hilfiger' brand detected with confidence 69.1% at location 215, 254, 146, 172
```

```
===== Detect Brands - remote =====
Detecting brands in remote image:
'Microsoft' brand detected with confidence 62.5% at location 58, 113, 106, 152
'Microsoft' brand detected with confidence 69.8% at location 58, 260, 86, 149
```

In [ ]:



AIDI1006-brands.ipynb





# Computer Vision

## Domain Specific Models // LOCAL

Call API with image and features // LOCAL

```
Open image file
```

```
local_image_path_shirt = os.path.join(images_folder, "gray-shirt-logo.jpg")
```

```
local_image_shirt = open(local_image_path_shirt, "rb")
```

```
Select the visual feature(s) you want
```

```
local_image_features = ["brands"]
```

```
Call API with image and features
```

```
detect_brands_results_local = computervision_client.analyze_image_in_stream(local_image_shirt, local_image_features)
```



# Computer Vision

## Domain Specific Models // REMOTE



Call API with image and features // REMOTE

```
Get a URL with a brand logo
```

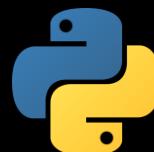
```
remote_image_url = "https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/images/gray-shirt-logo.jpg"
```

```
Select the visual feature(s) you want
```

```
remote_image_features = ["brands"]
```

```
Call API with URL and features
```

```
detect_brands_results_remote = computervision_client.analyze_image(remote_image_url, remote_image_features)
```



AIDI1006-brands.ipynb



SCREENSHOT!

## Your Turn!

Using cognitive services, write your code to analyse the following URL and the following local file:

(1) URL:

[https://www.incimages.com/uploaded\\_files/image/1920x1080/GettyImages-71974463\\_431181.jpg](https://www.incimages.com/uploaded_files/image/1920x1080/GettyImages-71974463_431181.jpg)

(2) Local: C:\images\brand2.jpg

# EXPECTED RESULTS!



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===== Detect Brands - local =====

Detecting brands in local image:

'Pepsi' brand detected with confidence 88.9% at location 773, 867, 284, 443

'Pepsi' brand detected with confidence 69.8% at location 1026, 1165, 461, 518

'Pepsi' brand detected with confidence 88.3% at location 1008, 1177, 268, 441

'Coca-Cola' brand detected with confidence 77.7% at location 210, 501, 302, 507

'Pepsi' brand detected with confidence 88.5% at location 593, 763, 284, 482

===== Detect Brands - remote =====

Detecting brands in remote image:

'Starbucks' brand detected with confidence 78.2% at location 1470, 1818, 3, 278

'Starbucks' brand detected with confidence 94.1% at location 427, 656, 576, 832

# Computer Vision

## Thumbnails

## **Computer Vision // Thumbnails**

A thumbnail is a miniature representation of a page or image that is used to identify a file by its contents. Thumbnails are an option in file managers, such as Windows Explorer, and they are found in photo editing and graphics program to quickly browse multiple images in a folder.



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```
In [17]: from azure.cognitiveservices.vision.computervision import ComputerVisionClient
from azure.cognitiveservices.vision.computervision.models import OperationStatusCodes
from azure.cognitiveservices.vision.computervision.models import VisualFeatureTypes
from msrest.authentication import CognitiveServicesCredentials

from array import array
import os
from PIL import Image
import sys
import time

subscription_key = "66e81584f4914a38a0f627b3ee888a72"
endpoint = "https://computer-vision-caio.cognitiveservices.azure.com/"
computervision_client = ComputerVisionClient(endpoint, CognitiveServicesCredentials(subscription_key))

Quickstart variables // These variables are shared by several examples
#images_folder = os.path.join(os.path.dirname(os.path.abspath(__file__)), "images")
images_folder = "C:\images"
local_image_path_objects = "C:\images\objects.jpg"

Generate Thumbnail - This example creates a thumbnail from both a local and URL image.

print("===== Generate Thumbnail =====")

Generate a thumbnail from a local image
local_image_path_thumb = os.path.join(images_folder, "objects.jpg")
local_image_thumb = open(local_image_path_objects, "rb")

print("Generating thumbnail from a local image...")
Call the API with a local image, set the width/height if desired (pixels)
Returns a Generator object, a thumbnail image binary (list).
thumb_local = computervision_client.generate_thumbnail_in_stream(100, 100, local_image_thumb, True)

Write the image binary to file
with open("thumb_local.png", "wb") as f:
 for chunk in thumb_local:
 f.write(chunk)
```





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```
print("===== Generate thumbnail =====")

Generate a thumbnail from a local image
local_image_path_thumb = os.path.join (images_folder, "objects.jpg")
local_image_thumb = open(local_image_path_objects, "rb")

print("Generating thumbnail from a local image...")
Call the API with a local image, set the width/height if desired (pixels)
Returns a Generator object, a thumbnail image binary (list).
thumb_local = computervision_client.generate_thumbnail_in_stream(100, 100, local_image_thumb, True)

Write the image binary to file
with open("thumb_local.png", "wb") as f:
 for chunk in thumb_local:
 f.write(chunk)

Uncomment/use this if you are writing many images as thumbnails from a list
for i, image in enumerate(thumb_local, start=0):
 with open('thumb_{0}.jpg'.format(i), 'wb') as f:
 f.write(image)

print("Thumbnail saved to local folder.")
print()

Generate a thumbnail from a URL image
URL of faces
remote_image_url_thumb = "https://raw.githubusercontent.com/Azure-Samples/cognitive-services-sample-data-files/master/ComputerVision/Images/faces.jpg"

print("Generating thumbnail from a URL image...")
Returns a Generator object, a thumbnail image binary (list).
thumb_remote = computervision_client.generate_thumbnail(
 100, 100, remote_image_url_thumb, True)

Write the image binary to file
with open("thumb_remote.png", "wb") as f:
 for chunk in thumb_remote:
 f.write(chunk)

print("Thumbnail saved to local folder.")
Uncomment/use this if you are writing many images as thumbnails from a list
```



AIDI1006-moderate-content.ipynb

localhost:8888/notebooks/wAIDI1006-thumbnails.ipynb

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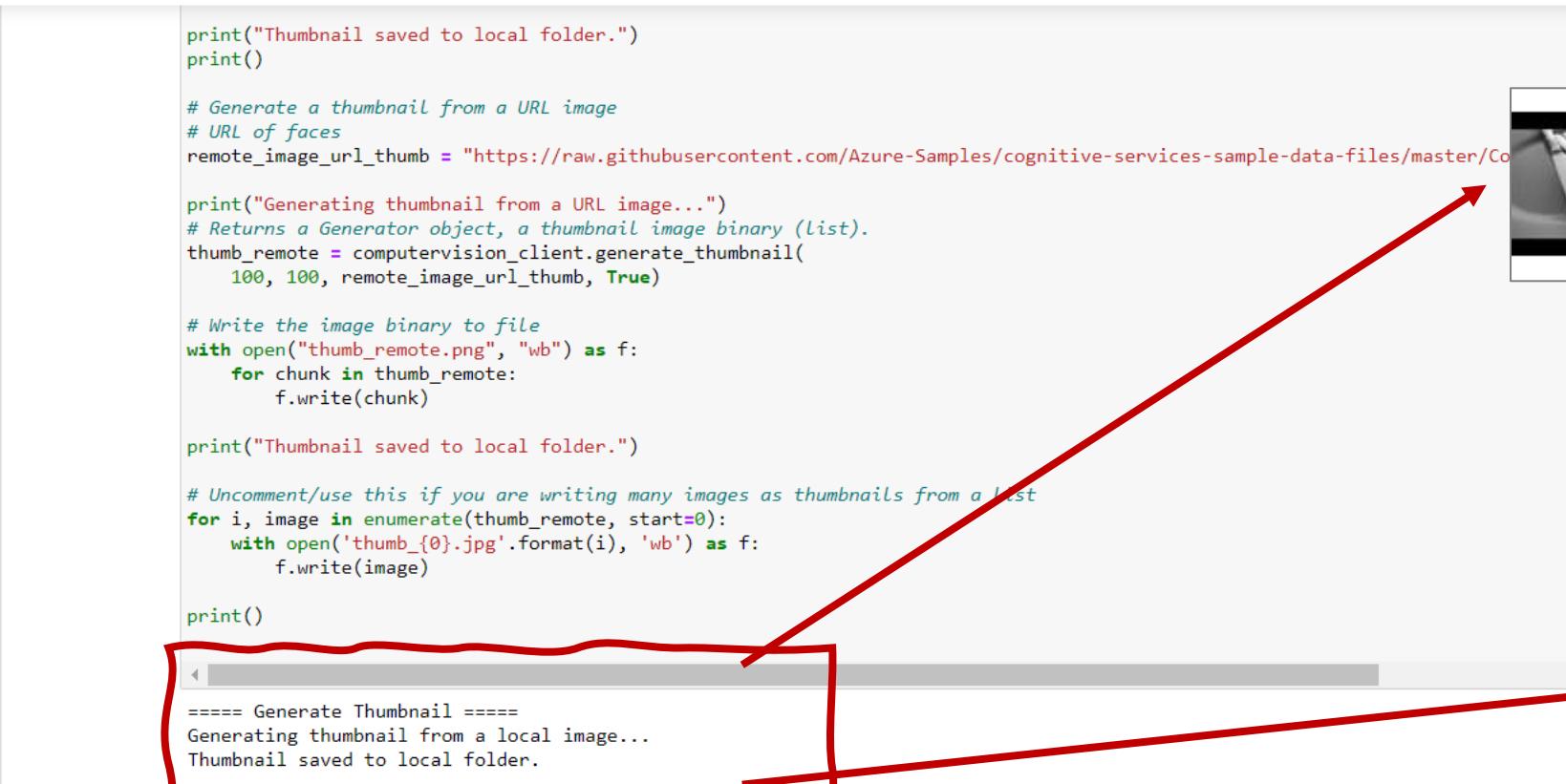
Logout

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print("Thumbnail saved to local folder.")  
print()  
  
# Generate a thumbnail from a URL image  
# URL of faces  
remote\_image\_url\_thumb = "https://raw.githubusercontent.com/Azure-Samples/cognitive-services-sample-data-files/master/ComputerVision/Images/forkspoon.jpg"  
  
print("Generating thumbnail from a URL image...")  
# Returns a Generator object, a thumbnail image binary (list).  
thumb\_remote = computervision\_client.generate\_thumbnail(  
 100, 100, remote\_image\_url\_thumb, True)  
  
# Write the image binary to file  
with open("thumb\_remote.png", "wb") as f:  
 for chunk in thumb\_remote:  
 f.write(chunk)  
  
print("Thumbnail saved to local folder.")  
  
# Uncomment/use this if you are writing many images as thumbnails from a list  
for i, image in enumerate(thumb\_remote, start=0):  
 with open('thumb\_{0}.jpg'.format(i), 'wb') as f:  
 f.write(image)  
  
print()

In [ ]:

===== Generate Thumbnail =====  
Generating thumbnail from a local image...  
Thumbnail saved to local folder.  
  
Generating thumbnail from a URL image...  
Thumbnail saved to local folder.





SCREENSHOT!

## Your Turn!

Using cognitive services, write your code to analyse your preferred local file (image) and an URL image and generate your thumbnails.

Take a screenshot of your result and add the local image and the URL image.

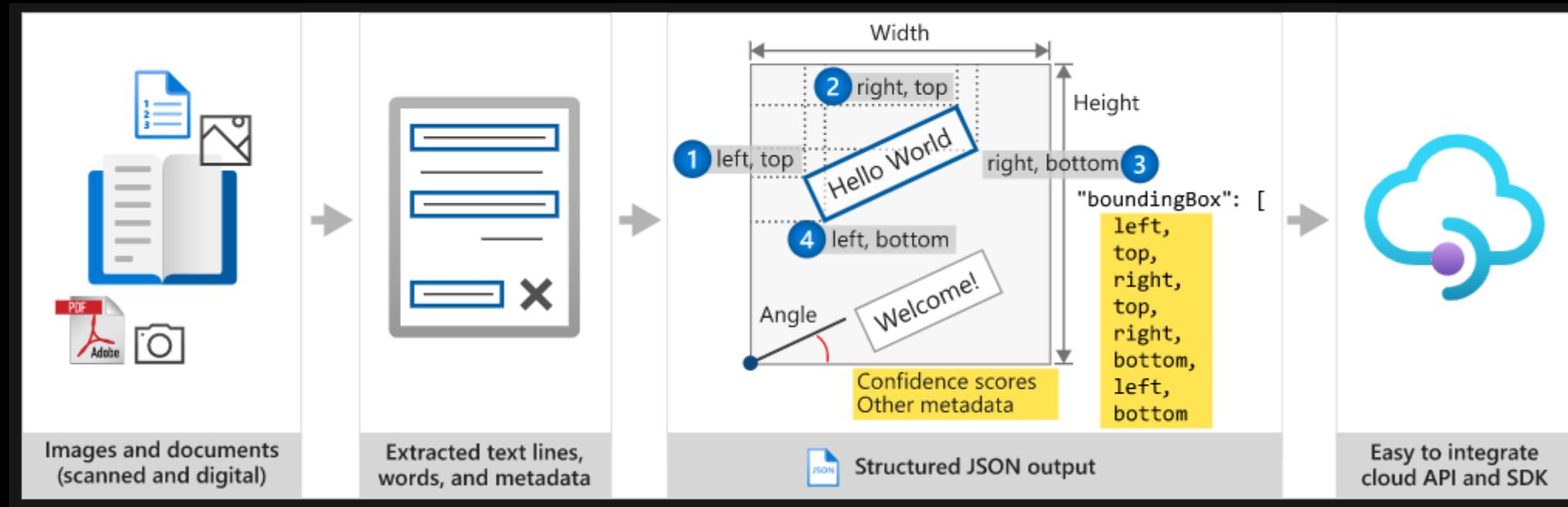
# **Computer Vision**

## **Text Detection**

## Computer Vision // Text Detection

Optical Character Recognition (OCR) allows you to extract printed or handwritten **text** from images, such as photos of street signs and products, as well as from documents – invoices, bills, financial reports, articles, and more. Microsoft’s OCR technologies support extracting **printed text** in several languages.

# Computer Vision // Text Detection



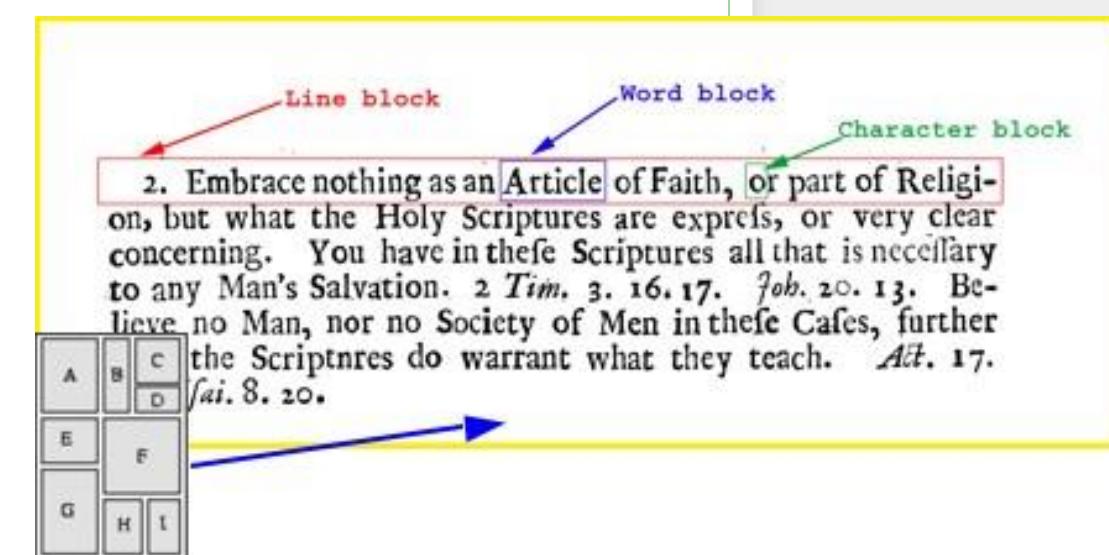


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```
if read_result.status == OperationStatusCodes.succeeded:
 for text_result in read_result.analyze_result.read_results:
 for line in text_result.lines:
 print(line.text)
 print(line.bounding_box)
print()
```

```
===== Read File - remote =====
Line block
[99.0, 28.0, 165.0, 27.0, 165.0, 38.0, 99.0, 38.0]
Word block
[235.0, 25.0, 301.0, 25.0, 301.0, 36.0, 235.0, 36.0]
Character block
[323.0, 40.0, 421.0, 40.0, 421.0, 51.0, 323.0, 51.0]
2. Embrace nothing as an Article of Faith, or part of Religi-
[40.0, 59.0, 389.0, 59.0, 389.0, 74.0, 40.0, 75.0]
on, but what the Holy Scriptures are expres, or very clear
[28.0, 75.0, 390.0, 75.0, 390.0, 89.0, 28.0, 89.0]
concerning. You have in thefe Scriptures all that is necefary
[27.0, 89.0, 390.0, 88.0, 390.0, 102.0, 27.0, 103.0]
to any Man's Salvation. 2 Tim. 3. 16. 17. foh. 20. 13. Be-
[29.0, 103.0, 390.0, 102.0, 390.0, 116.0, 29.0, 117.0]
lieve no Man, nor no Society of Men in thefe Cafes, further
[28.0, 117.0, 390.0, 116.0, 390.0, 130.0, 28.0, 131.0]
the Scriptnres do warrant what they teach. Alt. 17.
[57.0, 131.0, 388.0, 130.0, 388.0, 145.0, 57.0, 146.0]
A
[11.0, 141.0, 18.0, 142.0, 17.0, 149.0, 10.0, 148.0]
c
[45.0, 134.0, 56.0, 134.0, 55.0, 144.0, 44.0, 143.0]
D
[44.0, 151.0, 55.0, 151.0, 55.0, 159.0, 44.0, 159.0]
Vai. 8. 20.
[56.0, 145.0, 118.0, 145.0, 118.0, 159.0, 56.0, 159.0]
E
[9.0, 167.0, 16.0, 167.0, 16.0, 175.0, 9.0, 175.0]
H
[32.0, 202.0, 39.0, 202.0, 38.0, 209.0, 32.0, 209.0]
```





SCREENSHOT!

## Your Turn!

Using cognitive services, write your code to analyse the following URL:

[https://media.wired.com/photos/59327d3b44db296121d6b881/master/w\\_1600%2Cc\\_limit/bond\\_0011\\_Layer-5.jpg](https://media.wired.com/photos/59327d3b44db296121d6b881/master/w_1600%2Cc_limit/bond_0011_Layer-5.jpg)

# EXPECTED RESULTS!

===== Read File - remote =====

BEN MILLER

[416.0, 42.0, 583.0, 43.0, 582.0, 68.0, 416.0, 68.0]

Dear sam.

[87.0, 164.0, 291.0, 170.0, 290.0, 217.0, 86.0, 211.0]

Welcome onboard. I'm very excited to have you

[122.0, 253.0, 897.0, 253.0, 897.0, 301.0, 122.0, 302.0]

on our team for this project. your skills will

[120.0, 315.0, 819.0, 310.0, 819.0, 357.0, 120.0, 364.0]

certainly be a valued asset and I'm looking

[119.0, 372.0, 810.0, 370.0, 810.0, 415.0, 119.0, 416.0]

forward to seeing what you come up with

[111.0, 429.0, 825.0, 427.0, 825.0, 472.0, 111.0, 477.0]

Best,

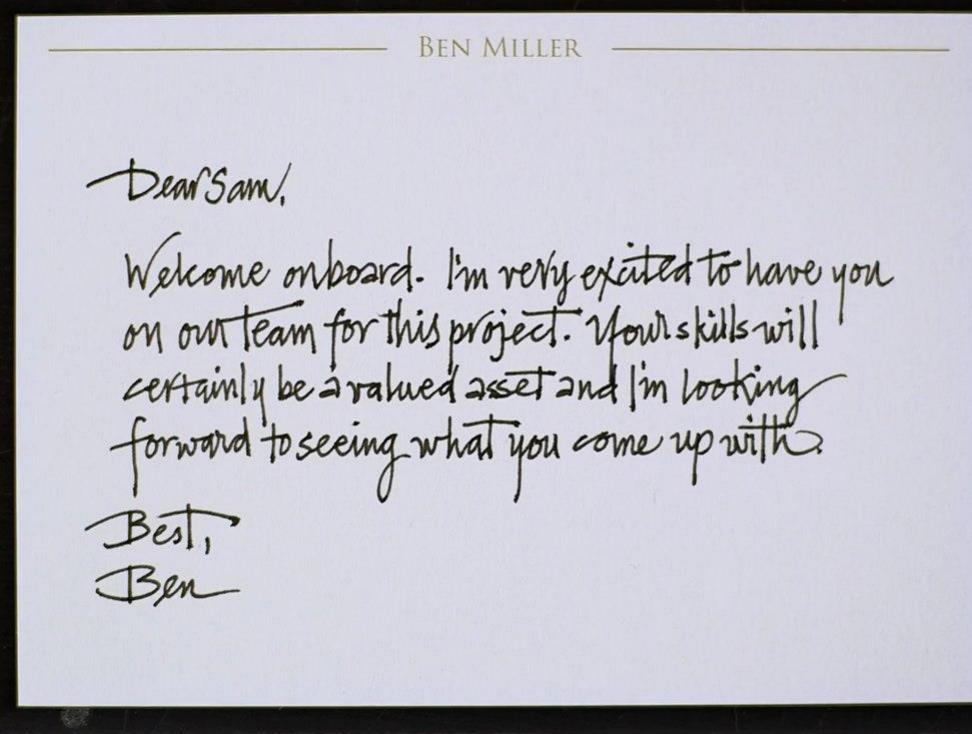
[88.0, 516.0, 229.0, 516.0, 229.0, 559.0, 88.0, 558.0]

Ben

[102.0, 570.0, 235.0, 574.0, 234.0, 615.0, 100.0, 614.0]



SCREENSHOT!



## **Computer Vision // Face Detection**

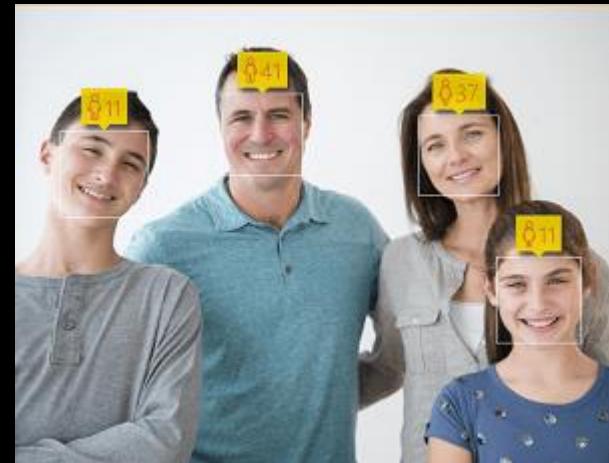
Computer Vision can detect human faces within an image and generate the age, gender, and rectangle for each detected face.

# Computer Vision // Face Detection



JSON

```
{
 "faces": [
 {
 "age": 23,
 "gender": "Female",
 "faceRectangle": {
 "top": 45,
 "left": 194,
 "width": 44,
 "height": 44
 }
 }
],
 "requestId": "8439ba87-de65-441b-a0f1-c85913157ecd",
 "metadata": {
 "height": 200,
 "width": 300,
 "format": "Png"
 }
}
```



JSON

```
{
 "faces": [
 {
 "age": 11,
 "gender": "Male",
 "faceRectangle": {
 "top": 62,
 "left": 22,
 "width": 45,
 "height": 45
 }
 },
 {
 "age": 11,
 "gender": "Female",
 "faceRectangle": {
 "top": 127,
 "left": 240,
 "width": 42,
 "height": 42
 }
 },
 {
 "age": 37,
 "gender": "Female",
 "faceRectangle": {
 "top": 55,
 "left": 200,
 "width": 41,
 "height": 41
 }
 },
 {
 "age": 41,
 "gender": "Male",
 "faceRectangle": {
 "top": 127,
 "left": 400,
 "width": 42,
 "height": 42
 }
 }
]
}
```

File Edit View Navigate Code Refactor Run Tools VCS Window Help AIDI1006-faceattributes - main.py

AIDI1006-faceattributes > main.py main

Project AIDI1006-faceattributes C:\Users\cailog\PycharmProjects\AIDI1006-faceattributes venv library root main.py External Libraries Scratches and Consoles

main.py

```
22 # Create an authenticated FaceClient.
23 face_client = FaceClient(ENDPOINT, CognitiveServicesCredentials(KEY))
24
25 ...
26 Detect face(s) with attributes in a URL image
27 ...
28 # Image of face(s)
29 face1_url = 'https://www.cheapflights.co.uk/news/wp-content/uploads/sites/138/2016/03/11-people-you-ll-find-in-london-01-620x414.jpg'
30 face1_name = os.path.basename(face1_url)
31 face2_url = 'https://assets.londonist.com/uploads/2018/11/i875/img-20171028-wa0004.jpg'
32 face2_name = os.path.basename(face2_url)
33
34 # List of url images
35 url_images = [face1_url, face2_url]
36
37 # Attributes you want returned with the API call, a list of FaceAttributeType enum (string format)
38 face_attributes = ['age', 'gender', 'headPose', 'smile', 'facialHair', 'glasses', 'emotion']
39
40 # Detect a face with attributes, returns a list[DetectedFace]
41 for image in url_images:
42 detected_faces = face_client.face.detect_with_url(url=image, return_face_attributes=face_attributes)
43 if not detected_faces:
44 raise Exception(
45 'No face detected from image {}'.format(os.path.basename(image)))
46
47 if __name__ == '__main__':
48
```

Run: main

C:\Users\cailog\PycharmProjects\AIDI1006-faceattributes\venv\Scripts\python.exe C:/Users/cailog/PycharmProjects/AIDI1006-faceattributes/main.py

Detected face ID from 11-people-you-ll-find-in-london-01-620x414.jpg :  
5713f667-f36d-4fec-9b75-1a8d29aa6aad

Facial attributes detected:

Computer Vision / Face Detection / Code

AIDI1006-faceatributes.py



Detected face ID from 11-people-you-ll-find-in-london-01-620x414.jpg :  
805e497a-b6cb-43ab-b846-540814f956a1

Facial attributes detected:

Age: 28.0

Gender: Gender.female

Head pose: {'additional\_properties': {}, 'roll': 9.7, 'yaw': -4.0, 'pitch': -6.3}

Smile: 1.0

Facial hair: {'additional\_properties': {}, 'moustache': 0.0, 'beard': 0.0, 'sideburns': 0.0}

Glasses: GlassesType.no\_glasses

Emotion:

Anger: 0.0

Contempt: 0.0

Disgust: 0.0

Fear: 0.0

Happiness: 1.0

Neutral: 0.0

Sadness: 0.0

Surprise: 0.0

Drawing rectangle around face... see popup for results.



Detected face ID from img-20171028-wa0004.jpg : d507a419-8426-447b-bd57-b5400d3f3ede

Facial attributes detected:

Age: 27.0

Gender: Gender.male

Head pose: {'additional\_properties': {}, 'roll': 0.1, 'yaw': 4.9, 'pitch': -0.1}

Smile: 1.0

Facial hair: {'additional\_properties': {}, 'moustache': 0.1, 'beard': 0.1, 'sideburns': 0.1}

Glasses: GlassesType.no\_glasses

Emotion:

Anger: 0.0

Contempt: 0.0

Disgust: 0.0

Fear: 0.0

Happiness: 1.0

Neutral: 0.0

Sadness: 0.0

Surprise: 0.0

Detected face ID from img-20171028-wa0004.jpg : 9d79f1dc-237b-4a33-864a-07945943cc1e

Facial attributes detected:

Age: 29.0

Gender: Gender.female

Head pose: {'additional\_properties': {}, 'roll': 4.9, 'yaw': -20.7, 'pitch': -0.0}

Smile: 0.992

Facial hair: {'additional\_properties': {}, 'moustache': 0.0, 'beard': 0.0, 'sideburns': 0.0}

Glasses: GlassesType.no\_glasses

Emotion:

Anger: 0.0

Contempt: 0.0

Disgust: 0.0

Fear: 0.0

Happiness: 0.992

Neutral: 0.008

Sadness: 0.0

Surprise: 0.0

# **Computer Vision // Available API's returns (1)**

## **Describe an Image**

- This example describes the contents of an image with the confidence score.

## **Categorize an Image**

- This example extracts (general) categories from a remote image with a confidence score.

## **Tag an Image**

- This example returns a tag (key word) for each thing in the image.

## **Detect Faces**

- This example detects faces in a local image, gets their gender and age, and marks them with a bounding box.

## **Detect Adult or Racy Content**

- This example detects adult or racy content in a local image, then prints the adult/racy score.

## **Detect Color**

- This example detects the different aspects of its color scheme in a local image.

## **Computer Vision // Available API's returns (2)**

### **Detect Domain-specific Content**

- This example detects celebrities and landmarks in local images.

### **Detect Image Types**

- This example detects an image's type (clip art/line drawing).

### **Detect Objects**

- This example detects different kinds of objects with bounding boxes in a local image.

### **Detect Brands**

- This example detects common brands like logos and puts a bounding box around them.

### **Generate Thumbnail**

- This example creates a thumbnail from both a local and URL image.

**Challenge #4.10**

**Azure Cognitive Services**

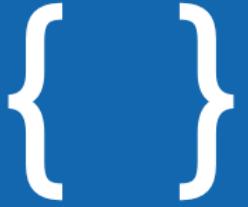
**LUIS**



# Language Understanding (LUIS)

Is a cloud-based conversational AI service that applies custom machine-learning intelligence to a users' conversational, natural language text to predict overall meaning, and pull out relevant, detailed information.

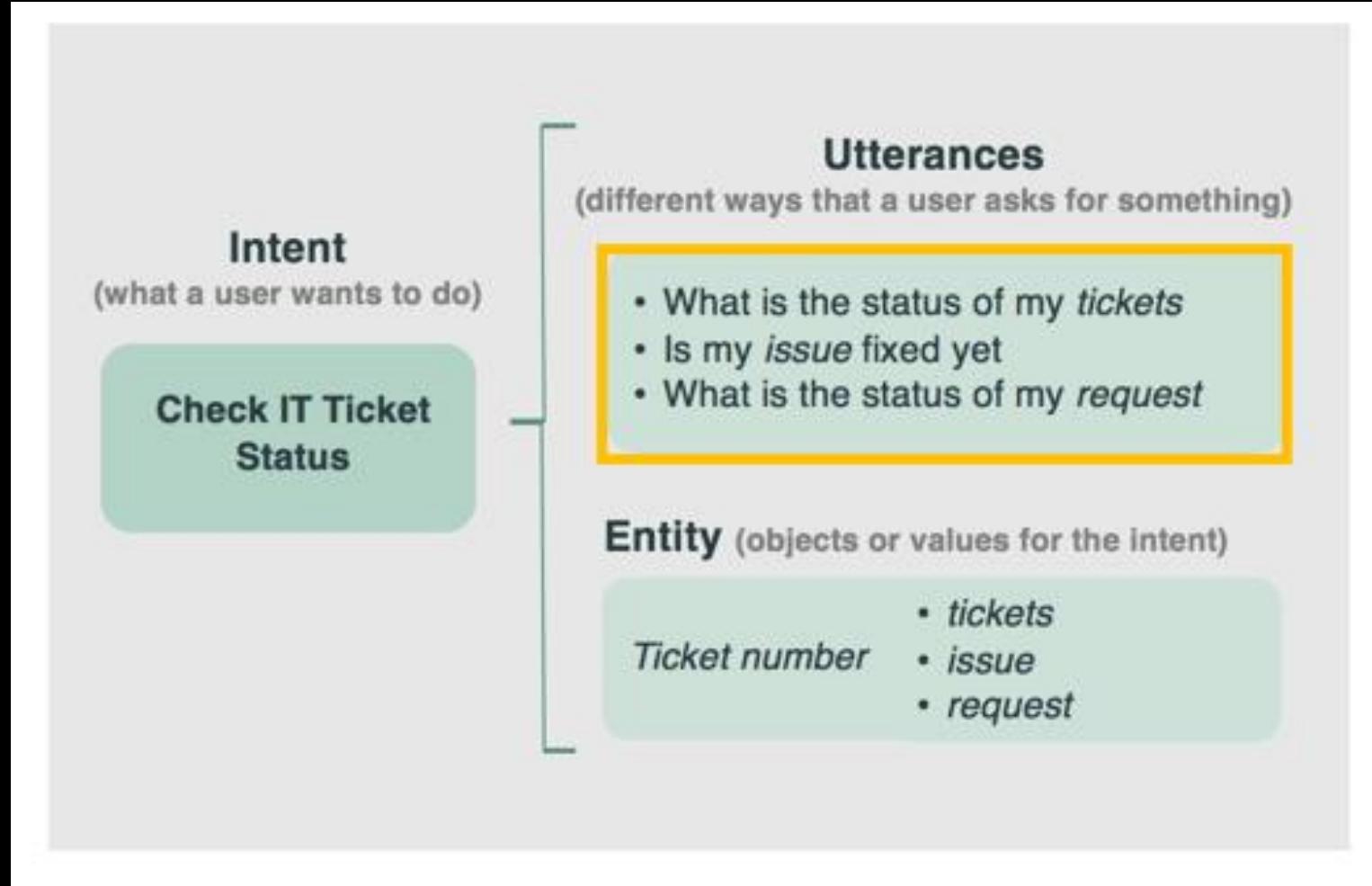
# What is NLP?



- Text analysis and entity recognition
- Sentiment analysis
- Speech recognition and synthesis
- Machine translation
- Semantic language modeling

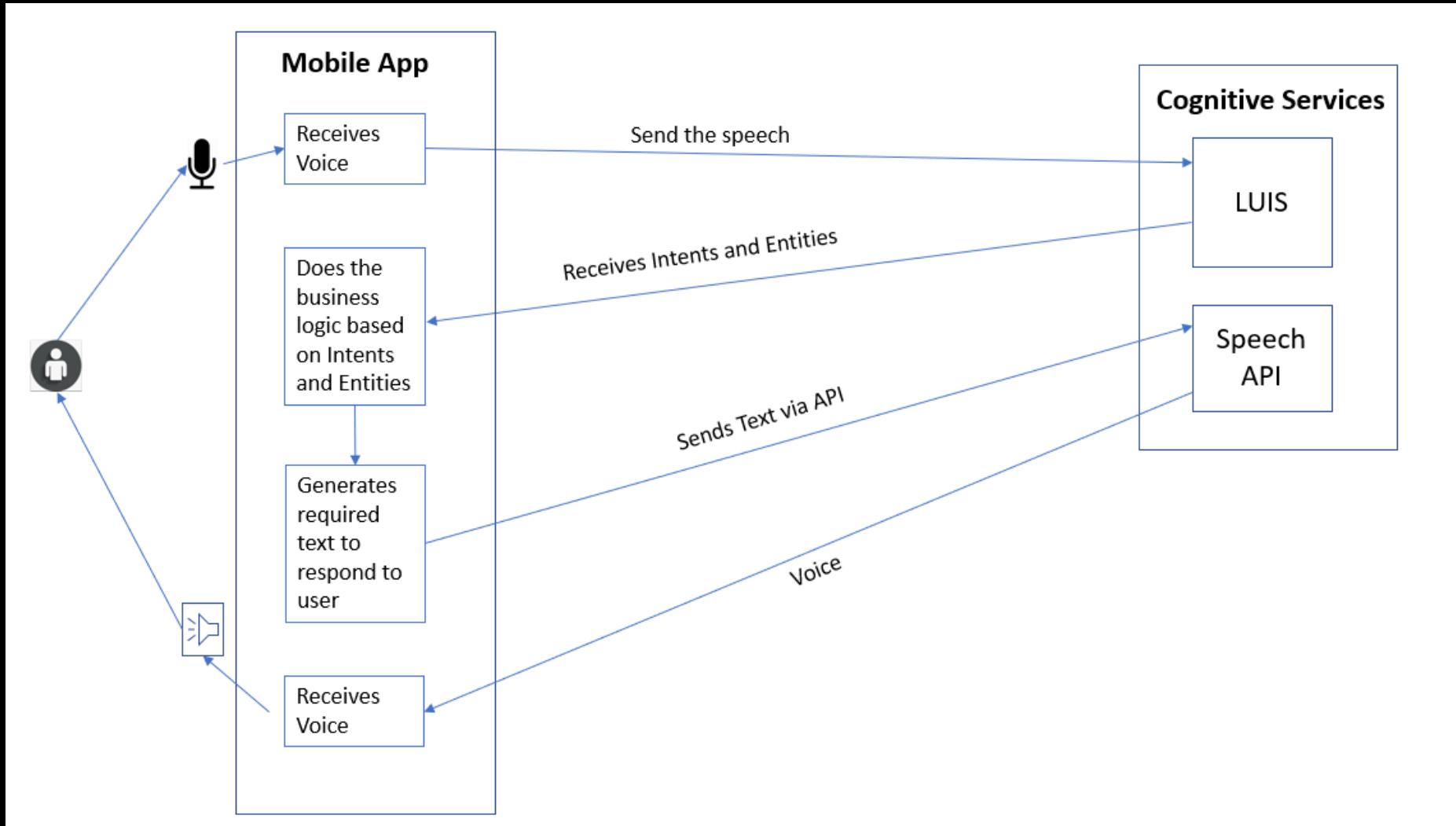
# Utterance – Entity – Intent

{ }



# Possible Project

{ }



LUIS (Language Understanding) - x +

luis.ai

Microsoft Azure Cognitive Services Language Understanding Support Resources Sign in

# Language Understanding (LUIS)

A machine learning-based service to build natural language into apps, bots, and IoT devices. Quickly create enterprise-ready, custom models that continuously improve.

Login / Sign up

2 tickets from Cairo to Seattle

intent = bookFlight  
source = cairo  
destination = seattle  
quantity = 2

## See Language Understanding in action

LUIS (Language Understanding) - x +

luis.ai

Microsoft Azure Cognitive Services Language Understanding Support Resources Sign in

# See Language Understanding in action

What the user says (utterances)

Book me a flight to Cairo

Order me 2 pizzas

Remind me to call my dad tomorrow

Where is the nearest club?

What LUIS returns

```
{
 "query": "Book me a flight to Cairo",
 "prediction": {
 "topIntent": "BookFlight",
 "intents": {
 "BookFlight": {
 "score": 0.9887482
 },
 "None": {
 "score": 0.04272597
 },
 "LocationFinder": {
 "score": 0.0125702191
 }
 }
 }
}
```

Language Understanding - Micro +    

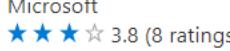
portal.azure.com/#blade/Microsoft\_Azure\_Marketplace/GalleryItemDetailsBladeNopdl/product/%7B"displayName"%3A"Language%20Understanding"%2C"itemDisplayName"%3A"Language... ☆

Microsoft Azure Search resources, services, and docs (G+/)

Home > Create a resource >

**Language Understanding** Microsoft

 **Language Understanding** Microsoft Add to Favorites



Create

Language Understanding Add to Favorites

→

Overview Plans Usage Information + Support Reviews

Language Understanding (LUIS) is a natural language processing service that enables you to understand human language in your own application, website, chatbot, IoT device, and more. After you configure and publish your LUIS model, your application can easily receive user input in natural language and take action. You don't need to understand machine learning to solve the problem of extracting meaning from input. Instead you get to focus on your own application logic and let LUIS do the heavy lifting on your behalf. After your LUIS model is built and deployed, it exports a simple HTTP endpoint that is called by your application.

More offers from Microsoft See All

|                                                                                                                                                                           |                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>Workspace</b><br>Microsoft<br>Virtual Machine<br>Azure Virtual Desktop resource | <br><b>Microsoft HPC Pack 2012 R2</b><br>Microsoft<br>Virtual Machine<br>Enterprise-class HPC solution. Easy to deploy, cost-effective and supports Windows/Linux workloads | <br><b>Windows 10 IoT Core Services</b><br>Microsoft<br>Azure Service<br>Commercialize your project with enterprise-grade security and support | <br><b>Web App + SQL</b><br>Microsoft<br>Azure Service<br>Enjoy secure and flexible development, deployment, and scaling options for your web app |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Create - Microsoft Azure

portal.azure.com/#create/Microsoft.CognitiveServicesLUISAllInOne

Microsoft Azure    Upgrade    Search resources, services, and docs (G+/-)

Home > Create a resource > Language Understanding >

## Create

Luis all in one

\* Basics   Tags   Review + create

Language Understanding (LUIS) is a natural language processing service that enables you to build your own custom model to understand human language programmatically or through the UI in the LUIS portal. After you are satisfied with your LUIS model, you publish it and query its prediction endpoint through your client application for an end to end conversational flow. To build, manage, train, test and publish your LUIS Model, you will need to create the below Authoring Resource. This also gives you 1,000 requests/month endpoint requests. If you want your client app to request beyond the 1,000 requests provided by the authoring, create the below Prediction Resource. If you know from the start you will be needing more than 1000 prediction requests as well as the authoring experience, create using the "Both" option. This will create two resources, one for each type. [Learn more](#)

Create options ⓘ   Both   Authoring   Prediction

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ   Free Trial

Resource group \* ⓘ   rg-caio-ai

Name \* ⓘ   language-understanding-caio1

Review + create   Next : Tags >

Add your resource information

The screenshot shows the Microsoft Azure 'Create' interface for a Language Understanding (LUIS) resource. The 'Basics' tab is active. A red box highlights the 'Subscription', 'Resource group', and 'Name' fields. An orange arrow points to the 'Name' field, which contains 'language-understanding-caio1'. The 'Subscription' dropdown shows 'Free Trial', and the 'Resource group' dropdown shows 'rg-caio-ai' with a 'Create new' option. At the bottom, there are 'Review + create' and 'Next : Tags >' buttons.

Create - Microsoft Azure

portal.azure.com/#create/Microsoft.CognitiveServicesLUISAllInOne

Microsoft Azure    Upgrade    Search resources, services, and docs (G+/-)

Home > Create a resource > Language Understanding >

**Create**

Luis all in one  
manage all your resources.

Subscription \* ⓘ    Free Trial

Resource group \* ⓘ    rg-caio-ai    Create new

Name \* ⓘ    language-understanding-caio1

**Authoring Resource**  
Select pricing and location for Authoring Resource

Authoring location \* ⓘ    (US) West US

Authoring pricing tier (Learn More) \* ⓘ    Free F0 (5 Calls per second, 1M Calls per month)

**Prediction Resource**  
Select pricing and location for Prediction Resource

Prediction location \* ⓘ    (US) East US

Prediction pricing tier (Learn More) \* ⓘ    Standard S0 (50 Calls per second)

Review + create    Next : Tags >

Add your resource information

The screenshot shows the Microsoft Azure 'Create a resource' interface for 'Language Understanding'. On the left, a sidebar lists various service categories like Home, Dashboard, All services, Favorites, and App Services. The main form is titled 'Create' and shows fields for Subscription (Free Trial), Resource group (rg-caio-ai), and Name (language-understanding-caio1). A large red box highlights the 'Authoring Resource' and 'Prediction Resource' sections, which include dropdowns for location and pricing tier. An orange arrow points to the 'Name' input field. At the bottom, there are 'Review + create' and 'Next : Tags >' buttons.

Create - Microsoft Azure

portal.azure.com/#create/Microsoft.CognitiveServicesLUISAllInOne

Microsoft Azure    Upgrade    Search resources, services, and docs (G+/)

Home > Create a resource > Language Understanding >

**Create**

Luis all in one  
manage all your resources.

Subscription \* (Free Trial)

Resource group \* (rg-caio-ai)

Name \* (language-understanding-caio1)

**Authoring Resource**

Select pricing and location for Authoring Resource

Authoring location \* (US) West US

Authoring pricing tier (Learn More) \* (Free F0 (5 Calls per second, 1M Calls per month))

**Prediction Resource**

Select pricing and location for Prediction Resource

Prediction location \* (US) East US

Prediction pricing tier (Learn More) \* (Standard S0 (50 Calls per second))

**Remember to always use the Free Tier to save money in your subscription**

**Review + create**    Next : Tags >

Select REVIEW+CREATE

LUIS (Language Understanding) - x +

luis.ai

Microsoft Azure Cognitive Services Language Understanding Support Resources Sign in

# Language Understanding (LUIS)

A machine learning-based service to build natural language into apps, bots, and IoT devices. Quickly create enterprise-ready, custom models that continuously improve.

Login / Sign up

2 tickets from Cairo to Seattle

intent = bookFlight  
source = cairo  
destination = seattle  
quantity = 2

## See Language Understanding in action

Conversation apps x + luis.ai/applications ? ☆

Cognitive Services | Language Understanding

## Conversation apps

Azure subscription: No subscription selected / Authoring resource: No authoring resource selected [Choose a different authoring resource.](#)

+ New app | Rename | Export | Import |  |

Name

Welcome to the Language Understanding Intelligent Service (LUIS)!

To access LUIS, you need an authoring resource. You can use an existing resource in your Azure subscription or create a new one. [Learn more about creating an Azure resource.](#)

Current Azure directory

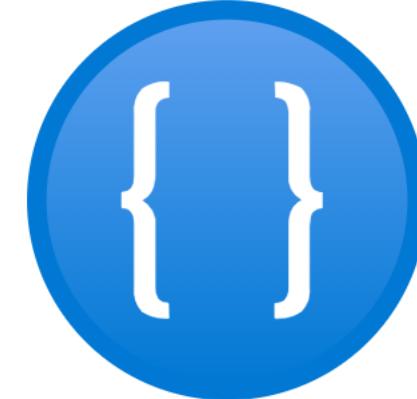
- Name: Default Directory
- Id: 362067a6-2936-460f-ae05-bf263cebe940

[Switch to a different Azure directory](#)

Subscription

Azure subscription 1

Select or create an authoring resource



An orange arrow points to the "Select or create an authoring resource" button at the bottom of the modal window.

Conversation apps x + luis.ai/applications ? ☆

Cognitive Services | Language Understanding

## Conversation apps

Azure subscription: Azure subscription 1 / Authoring resource: No authoring resource selected

+ New app | Rename | Export | Import logs

Name

Choose an authoring resource

Switching your authoring resource will also switch to your apps. You can switch back at any time. [Learn more about resources in Azure.](#)

Azure directory

Default Directory

Note: To switch to another directory, use the top right user avatar.

Azure subscription \*

Azure subscription 1

Authoring resource\* ⓘ

Select an authoring resource ...

language-understanding-ai1006-Aut... (westus, F0)

Create a new authoring resource

Done Cancel ...

Select your SUBSCRIPTION and your RESOURCE

Conversation apps x + luis.ai/applications

Cognitive Services | Language Understanding ? 📈 😊 🚨

## Conversation apps

Azure subscription: Azure subscription 1 / Authoring resource: No autho

+ New app | Rename | Export | Import logs

Name

Choose an authoring resource

Switching your authoring resource will also switch to your apps. You can switch back at any time. [Learn more about resources in Azure.](#)

Azure directory

Default Directory

Note: To switch to another directory, use the top right user avatar.

Azure subscription \*

Azure subscription 1

Authoring resource\* ⓘ

language-understanding-ai1006-Authoring

Pricing tier: Free (F0)

Managed identity: Disabled

Create a new authoring resource

Done Cancel ...

Select DONE

Conversation apps x + luis.ai/applications ? ☆

Cognitive Services | Language Understanding - westus

## Conversation apps

Azure subscription: Azure subscription 1 / Authoring resource: language-understanding-ai1006-Authoring [Choose a different authoring resource.](#)

+ New app  Rename Export Import logs Export logs Delete



| Name | Last modified | Culture | Endpoint hits |
|------|---------------|---------|---------------|
|------|---------------|---------|---------------|

You don't have any apps yet.

Select NEW APP

Conversation apps x + luis.ai/applications ? ☆

Cognitive Services | Language Understanding - westus

## Conversation apps

Azure subscription: Azure subscription 1 / Authoring resource: language-understanding-ai1006

+ New app | Rename | Export | Import logs

Name Culture Endpoint hits

Create new app

Name \* first\_App

Culture \* English

Description Type app description ...

Prediction resource language-understanding-ai1006

Done Cancel ...

Enter your App Name / Select DONE

Intents x + luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents ? 1 ☺ ⚙

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1 Train Test Publish

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

Intents

How to create an effective LUIS app

1. Design your schema

2. Build your model

3. Improve your app

Create a schema that matches your real-world scenario.

Create an intent for each action your bot can perform. Use entities to collect data needed to complete that action.

Example schema — Determine your bot's capabilities; create corresponding intents; add example utterances, and create entities to collect data. Create additional entities for each type of information collected.

Bot action: Purchase airline tickets Reserve rental cars Make hotel reservations

Intent: bookFlight rentCar reserveHotel

Example utterances:

| Purchase airline tickets                                                                                                                                                       | Reserve rental cars                                                                | Make hotel reservations                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| "Book a flight to <u>Seattle</u> "<br>"Buy 3 tickets to <u>New York</u> "<br>"book a flight to <u>Rio</u> on <u>Contoso Air</u> "<br>"get me a flight to <u>Rio</u> next week" | "Book a car on July 1 from <u>Seattle</u> "<br>"reserve a car in <u>New York</u> " | "find hotels in <u>Seattle</u> from May 1-5"<br>"reserve a hotel room in <u>New York</u> " |

Entities: city, airline city city

Search for an intent by name ...

```
graph LR; PA[Purchase airline tickets] --> bookFlight[bookFlight]; RC[Reserve rental cars] --> rentCar[rentCar]; MH[Make hotel reservations] --> reserveHotel[reserveHotel];
```

Intents

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

Intents i

+ Create Add prebuilt domain intent Rename Delete

Search for an intent by name ...

Name ↑ Examples Features

None 0 + Add feature

Select INTENTS / CREATE

The screenshot shows the Microsoft LUIS (Language Understanding) interface. The top navigation bar includes 'Cognitive Services' and 'Language Understanding - westus'. Below it, the application path is 'My LUIS / first\_App v0.1'. The main tabs are 'DASHBOARD', 'BUILD' (which is selected), and 'MANAGE'. Sub-tabs include 'Train', 'Test', and 'Publish'. On the left, a sidebar lists 'App Assets', 'Intents' (which is highlighted with an orange arrow), 'Entities', 'Prebuilt Domains', 'Improve app performance', 'Review endpoint utterances', 'Features', and 'Patterns'. The main content area is titled 'Intents' with a help icon. It features a 'Create' button with an orange arrow pointing to it, followed by 'Add prebuilt domain intent', 'Rename', and 'Delete' buttons. A search bar says 'Search for an intent by name ...'. Below is a table with columns 'Name ↑', 'Examples', and 'Features'. One row is listed with 'None' in the Name column, '0' in Examples, and a '+ Add feature' button in Features.

Intents

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

Intents

+ Create + Add prebuilt domain intent ⚙ Rename 🗑 Delete

Search for an intent by name ...

Name ↑ Examples Features

None

Create new intent

Intent name \*

switch OFF

Done Cancel ...

The screenshot shows the Microsoft LUIS interface for creating a new intent. A modal dialog titled "Create new intent" is open, prompting for an "Intent name \*". The input field contains the value "switch OFF". At the bottom of the dialog are two buttons: "Done" (highlighted with an orange arrow) and "Cancel ...". The background shows the main LUIS dashboard with a list of intents and other application settings.

Enter your INTENT name

LUIS: Intent Page: switch\_OFF

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents/938631e7-e618-4313-ba02-12580573dd40

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

switch\_OFF

Machine learning features ⓘ

+ Add feature

Examples ⓘ

✓ Confirm all entities ⏪ Move to ⏴ Delete ⏴ ...

View options ⏴

Example user input Score

Type an example of what a user might say and hit Enter.

turn the light off

turn off the ligh

Add a couple of INTENTS

Type an example of what a user might say and hit Enter.

LUIS: Intent Page: switch\_OFF

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents/938631e7-e618-4313-ba02-12580573dd40

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

switch\_OFF

Machine learning features

Examples

✓ Confirm all entities Move to Delete ...

Example user input Score

Type an example of what a user might say and hit Enter.

turn the light off

turn off the ligh

Select TRAIN to train your model

App has untrained changes

Turn the light off

Turn off the ligh

LUIS: Intent Page: switch\_OFF

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents/938631e7-e618-4313-ba02-12580573dd40

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

switch\_OFF

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

Machine learning features

+ Add feature

Examples

✓ Confirm all entities Move to Delete ...

View options @

Example user input Score

Type an example of what a user might say and hit Enter.

turn the light off 0.956

turn off the ligh 0.958

Select TEST to test your model

Luis: Intent Page: switch\_OFF

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/build/intents/938631e7-e618-4313-ba02-12580573dd40

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE

App Assets

Intents

Entities

Prebuilt Domains

Improve app performance

Review endpoint utterances

Features

Patterns

## switch\_OFF

Machine learning features

+ Add feature

Examples

✓ Confirm all entities Move to Delete ...

Example user input

Type an example of what a user might say and hit Enter.

turn the light off

turn off the ligh

Test

Start over

Batch testing panel

Type a test utterance ...

off ligths

switch\_OFF (0.566)

Inspect

ligths off

switch\_OFF (0.566)

Inspect

ligths offe

None (0.891)

Inspect

ligths off

switch\_OFF (0.566)

Inspect

Enter some test utterances

The screenshot shows the Microsoft LUIS web interface for the 'switch\_App' application. The 'BUILD' tab is active. In the center, the 'switch\_OFF' intent is displayed with its machine learning features and examples. The 'Test' pane on the right shows predicted intents for various test utterances. An orange arrow points to the 'Type a test utterance ...' input field in the 'Test' pane.

Application Settings x +

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/manage/general

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

Application Settings

App name

App description (optional)  
Type text here ...

App ID  5ff6d0bd-33c0-429d-b7fd-80cb9c706885

Culture en-us

Make endpoints public i  Off

Version Settings

Use non-deterministic training i  On (recommended)

Select MANAGE



Application Settings x +

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/manage/general

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

Settings

Publish Settings

Azure Resources

Versions

Application Settings

App name 

first\_App

App description (optional)

Type text here ... 

App ID

 5ff6d0bd-33c0-429d-b7fd-80cb9c706885

Culture

en-us

Make endpoints public 

Off

Version Settings

Use non-deterministic training 

On (recommended)

https://www.luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/mana...

Define your App description and select PUBLISH 

Application Settings x + luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/manage/general

Cognitive Services | Language Understanding - westus ? 5 ☺⚙️

My LUIS / first\_App v0.1 DASHBOARD BUILD MANAGE Train Test Publish

«

Settings

Publish Settings

Azure Resources

Versions

## Application Settings

App name

App description (optional)

App ID 5ff6d0bd-33c0-429d-b

Culture en-us

Make endpoints public  Off

### Choose your publishing slot and settings

Staging Slot  
Last Published: 6/28/2021  
Sentiment Analysis:  Off  
Speech Priming:  Off  
[Change settings](#)

Production slot

**Done** **Cancel ...**

## Version Settings

Use non-deterministic training  On (recommended)

Select STAGING OR PRODUCTION / Select DONE

Cognitive Services | Language Understanding - westus

?  ☺ ☰

## DASHBOARD

BUILD

## MANAGE

 Train

## A Test

 Publish

My LUIS / first App v0.1 ▾

## Application Settings

App name 

first App

App description (optional)

final App

App ID

 5ff6d0bd-33c0-429d-b7fd-80cb9c70688

Culture

en-us

Make endpoints public ⓘ

Off

## Version Settings

Use non-deterministic training

On (recommended)

 Publish app 'first\_App' completed

4:18 PM

### Access your endpoint Urls



Azure Resources

luis.ai/applications/5ff6d0bd-33c0-429d-b7fd-80cb9c706885/versions/0.1/manage/resources

Cognitive Services | Language Understanding - westus

My LUIS / first\_App v0.1

DASHBOARD BUILD MANAGE Train Test Publish

Settings Publish Settings Azure Resources Versions

« Azure Resources

LUIS uses two types of resources: authoring and prediction. The authoring key is needed for authoring, publishing, managing collaborators, and versioning. An authoring resource is created for you when you create your azure cognitive service account. When you are ready to publish your LUIS app, you need to create the prediction resource key and use the prediction key with endpoint queries. [Learn more.](#)

Prediction Resources Authoring Resource

Add prediction resource

**language-understanding-ai1006**

Un-assign key

Resource group: rg-caio-ai

Location: eastus

Primary Key: [1f37eae4fb0405a9c599b159c958d4a](#)

Secondary Key: [ea9ecbc985754216852d48f76b568f89](#)

Endpoint URL: <https://language-understanding-ai1006.cognitiveservices.azure.com/>

Pricing Tier: F0 (Free)

Example Query: <https://language-understanding-ai1006.cognitiveservices.azure.com/luis/prediction/v3.0/apps/5ff6d0bd-33c0-429d-b7fd-80cb9c706885>

Copy the Example Query field and paste it in your browser

```
{
 query: "YOUR_QUERY_HERE",
 prediction: {
 topIntent: "switch_OFF",
 intents: {
 switch_OFF: {
 score: 0.3454776
 },
 None: {
 score: 0.29123414
 }
 },
 entities: {}
 }
}
```

**Download the source code  
(ai-fundamentals)**

GitHub - MicrosoftDocs/ai-fundamentals +

github.com/MicrosoftDocs/ai-fundamentals

Why GitHub? Team Enterprise Explore Marketplace Pricing

Search Sign in Sign up

MicrosoftDocs / ai-fundamentals Notifications Star Fork 498

Code Issues 1 Pull requests Actions Projects Wiki Security Insights

master 1 branch 0 tags Go to file Code

sherzyang Merge pull request #19 from sherzyang/master ... 8e9f404 on Nov 20, 2020 93 commits

|                                        |                                       |               |
|----------------------------------------|---------------------------------------|---------------|
| .devcontainer                          | Suppress Python page                  | 11 months ago |
| .vscode                                | Change kernel.                        | 8 months ago  |
| data                                   | Update form-receipt code              | 12 months ago |
| images                                 | Custom Vision v 1                     | 13 months ago |
| instructions                           | Remove extra step in instructions.    | 7 months ago  |
| python_code                            | Updates to support Azure ML Notebooks | 9 months ago  |
| .gitignore                             | Initial commit                        | 15 months ago |
| 01a - Image Analysis with Computer ... | Remove extra copy paste instructions. | 9 months ago  |
| 01b - Image Classification.ipynb       | Remove extra copy paste instructions. | 9 months ago  |
| 01c - Object Detection.ipynb           | Remove extra copy paste instructions. | 9 months ago  |
| 01d - Face Analysis.ipynb              | Remove extra copy paste instructions. | 9 months ago  |

About

Code samples for AI fundamentals

Readme MIT License

Releases No releases published

Packages No packages published

Contributors 3

GraemeMalcolm Graeme Malcolm

sherzyang Sherzy Yang

<https://github.com/MicrosoftDocs/ai-fundamentals>

Microsoft Azure Machine Learning

Home > Notebooks

## Notebooks

Files Samples

Users  
caiogasparine  
regression-automl-nyc-taxi-data  
.amlignore  
text-translator.ipynb

- ...
- [Create new file](#)
- [Create new folder](#)
- [Upload files](#)
- [Upload folder](#)
- [Copy folder path](#)
- [Open terminal](#)



Notebooks allow users to work with files, folders and Jupyter Notebooks directly in the workspace.

Browse your files and shared files with easy collaboration tools. You can also start with a Jupyter Notebook in the workspace with easy access to all workspace assets including experiment details, datasets, models and more. [Learn more](#)

+ Create Terminal

## Microsoft Azure Machine Learning

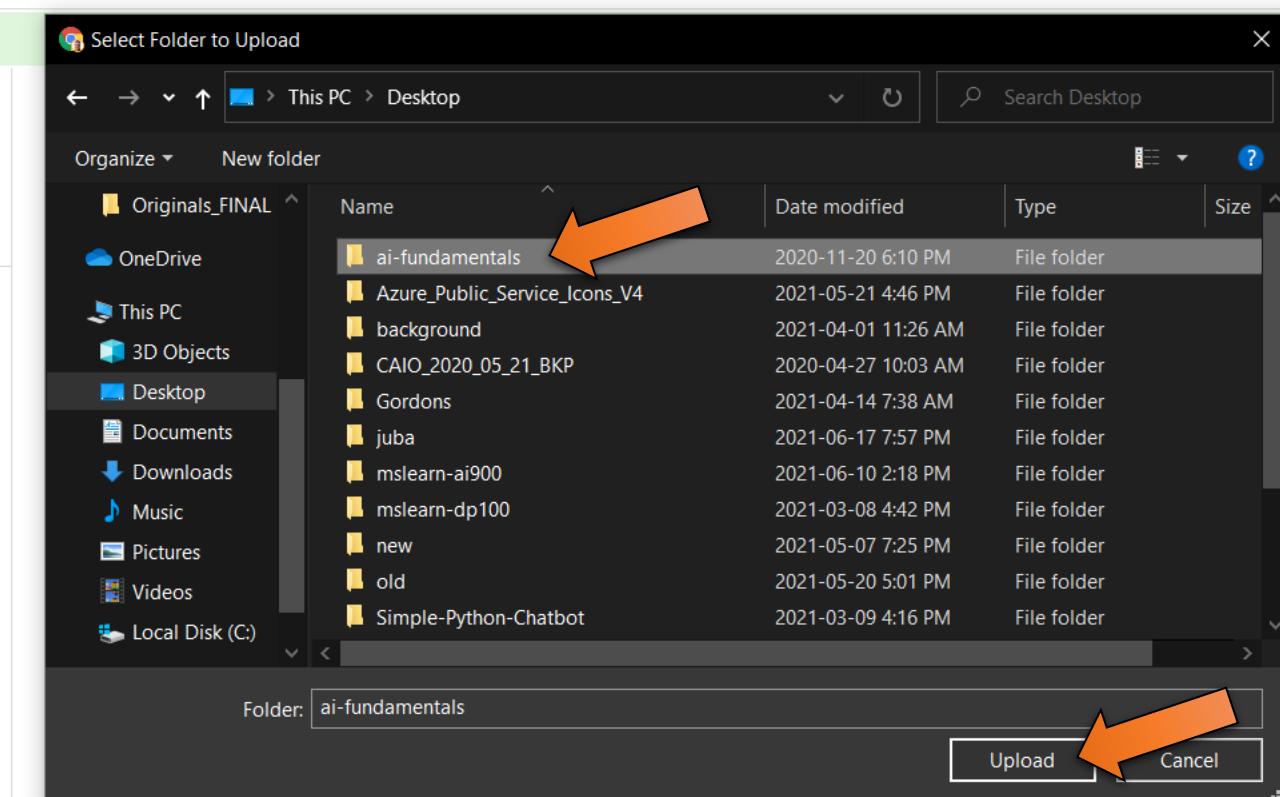
- New
- Home
- Author
- Notebooks**
- Automated ML
- Designer
- Assets
- Datasets
- Experiments
- Pipelines
- Models
- Endpoints
- Manage
- Compute
- Environments (preview)
- Datastores
- Data Labeling
- Linked Services

Success: Successfully uploaded all files

### Notebooks

Files Samples

- Users
  - caiogasparine
    - ai-fundamentals ↗
    - regression-automl-nyc-taxi-data
    - .amlignore
    - text-translator.ipynb



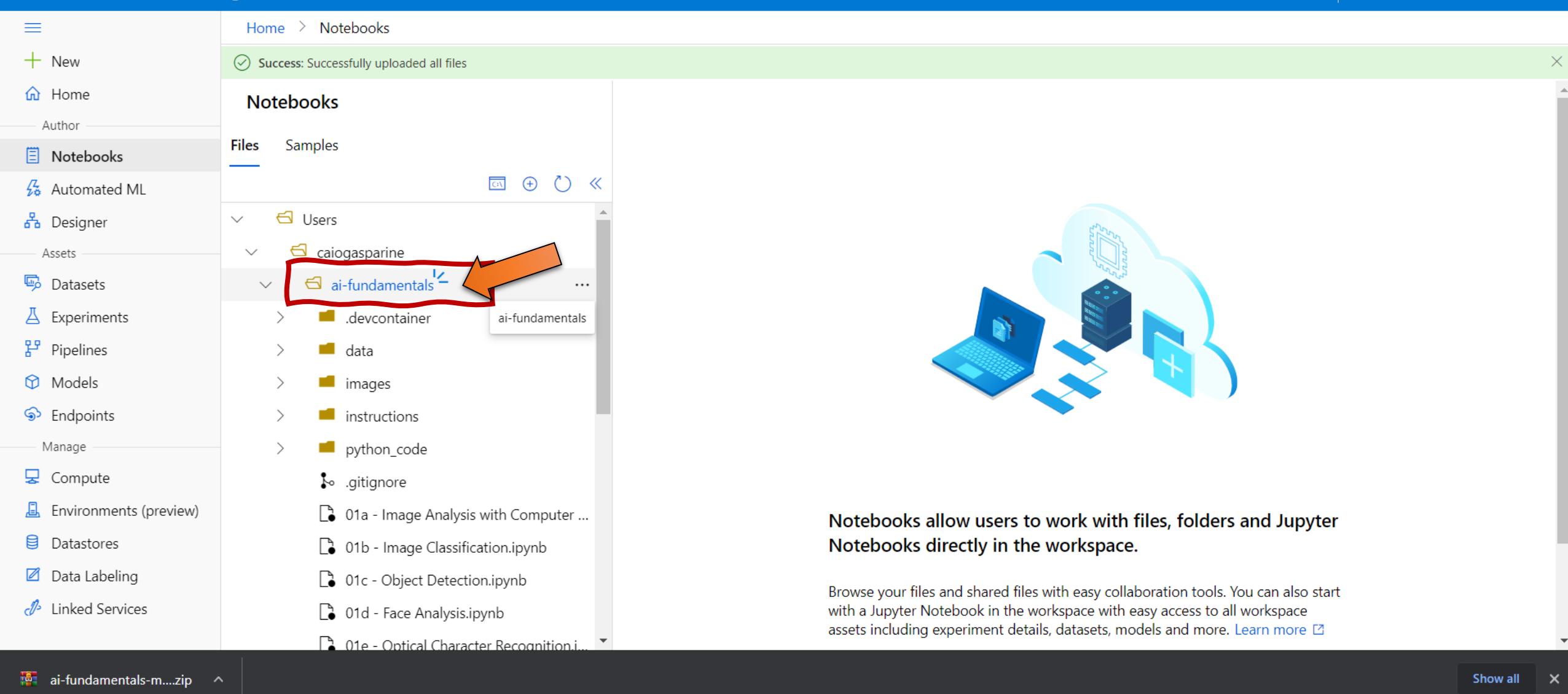
Notebooks directly in the workspace.

Browse your files and shared files with easy collaboration tools. You can also start with a Jupyter Notebook in the workspace with easy access to all workspace assets including experiment details, datasets, models and more. [Learn more](#)

And upload all the files (python code)

Show all

Microsoft Azure Machine Learning



Wait for the upload and check the imported folder

A machinelearning-ai1006 - Micros x Notebooks - Microsoft Azure Ma x +

ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-46... ☆

## Microsoft Azure Machine Learning

Home > Notebooks

Success: Successfully uploaded all files

### Notebooks

Files Samples

- 01a - Image Analysis with Computer Vision.ipynb
- 01b - Image Classification.ipynb
- 01c - Object Detection.ipynb
- 01d - Face Analysis.ipynb
- 01e - Optical Character Recognition.ipynb
- 01f - Receipts with Form Recognizer.ipynb
- 02a - Text Analytics.ipynb
- 02b - Speech.ipynb
- 02c - Translation.ipynb
- 02d - Language Understanding.ipynb
- 03a - QnA Bot.ipynb

M CODE\_OF\_CONDUCT.md

L LICENSE

M README.md

M SECURITY.md



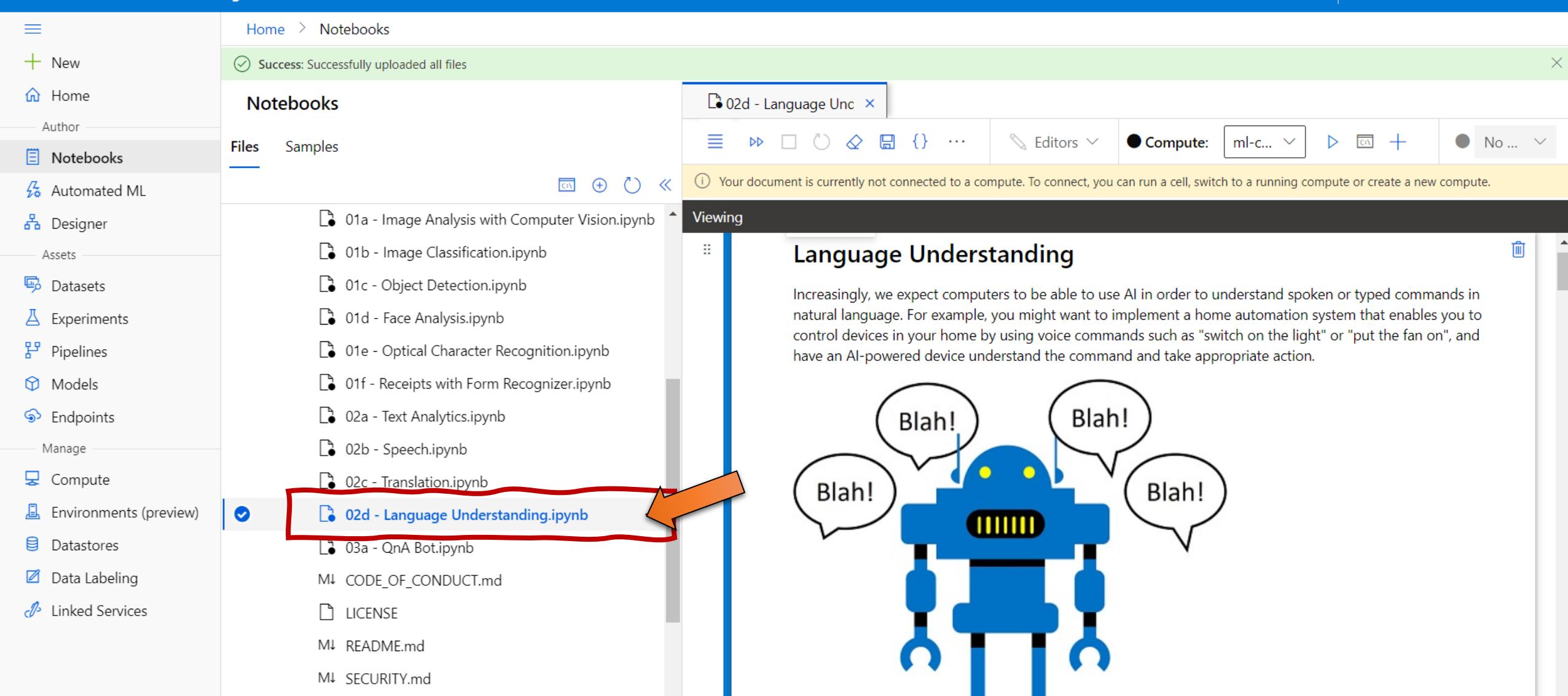
Notebooks allow users to work with files, folders and Jupyter Notebooks directly in the workspace.

Browse your files and shared files with easy collaboration tools. You can also start with a Jupyter Notebook in the workspace with easy access to all workspace assets including experiment details, datasets, models and more. [Learn more](#)

+ Create Terminal

There are several examples using python

Microsoft Azure Machine Learning



machinelearning-ai1006 - Micros x Notebooks - Microsoft Azure Ma x + ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-46... ☆

## Microsoft Azure Machine Learning

Home > Notebooks

Success: Successfully uploaded all files

### Notebooks

Files Samples

- 01a - Image Analysis with Computer Vision.ipynb
- 01b - Image Classification.ipynb
- 01c - Object Detection.ipynb
- 01d - Face Analysis.ipynb
- 01e - Optical Character Recognition.ipynb
- 01f - Receipts with Form Recognizer.ipynb
- 02a - Text Analytics.ipynb
- 02b - Speech.ipynb
- 02c - Translation.ipynb
- 02d - Language Understanding.ipynb
- 03a - QnA Bot.ipynb

M CODE\_OF\_CONDUCT.md

LICENSE

M README.md

M SECURITY.md

### 02d - Language Unc x

Editors Compute: ml-c... No ...

Your document is currently not connected to a compute. To connect, you can run a cell, switch to a running compute or create a new compute.

### Editing

```
from python_code import luis
import matplotlib.pyplot as plt
from PIL import Image
import os
%matplotlib inline

try:
 # Set up API configuration
 luis_app_id = 'YOUR_LU_APP_ID'
 luis_key = 'YOUR_LU_KEY'
 luis_endpoint = 'YOUR_LU_ENDPOINT'

 # prompt for a command
 command = input('Please enter a command: \n')

 # get the predicted intent and entity (code in python_code.home_auto.py)
 action = luis.get_intent(luis_app_id, luis_key, luis_endpoint, command)

 # display an appropriate image
 img_name = action + '.jpg'
 img = Image.open(os.path.join("data", "luis", img_name))
 plt.axis('off')
 plt.imshow(img)
except Exception as ex:
 print(ex)
```

Add your APP-ID, KEY and ENDPOINT to the code

There are several different ways to write your code. This is just one of them.

language-understanding-ai1006 x Notebooks - Microsoft Azure Ma +

ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-460f-ae05-bf263cebe940

Microsoft Azure Machine Learning

Home > Notebooks

Success: Successfully uploaded all files

Notebooks

Files Samples

01a - Image Analysis with Computer Vision.ipynb  
01b - Image Classification.ipynb  
01c - Object Detection.ipynb  
01d - Face Analysis.ipynb  
01e - Optical Character Recognition.ipynb  
01f - Receipts with Form Recognizer.ipynb  
02a - Text Analytics.ipynb  
02b - Speech.ipynb  
02c - Translation.ipynb  
**02d - Language Understanding.ipynb**  
03a - QnA Bot.ipynb  
CODE\_OF\_CONDUCT.md  
LICENSE  
README.md  
SECURITY.md

Run all cells (Alt+R) Help

Editors Compute: ml-c... No ...

'ml-compute' connecting

```
1 from python_code import luis
2 import matplotlib.pyplot as plt
3 from PIL import Image
4 import os
5 %matplotlib inline
6
7 # Set up API configuration
8 luis_app_id = '1'
9 luis_key = '1'
10 luis_endpoint = '1'
11
12 # prompt for a command
13 command = input('Please enter a command: \n')
14
15 # get the predicted intent and entity (code in python_code.home_auto.py)
16 action = luis.get_intent(luis_app_id, luis_key, luis_endpoint, command)
17
18 # display an appropriate image
19 img_name = action + '.jpg'
20 img = Image.open(os.path.join("data", "luis", img_name))
21 plt.axis('off')
22 plt.imshow(img)
23 except Exception as ex:
24 print(ex)
```

\* Queued

There are several different ways to write your code. This is just one of them.

## MAIN STEPS

- Create Language Understanding resource - Azure Portal
- Login to LUIS.AI ([www.luis.ai](http://www.luis.ai))
- Create a **new project**
- Enter App + intent + entities
- **Train** the model + **Publish** the model
- Copy **App ID**
- Copy **Keys + Endpoints** to the code
- Execute the code



SCREENSHOT!

## ASSIGNMENT

Prepare your own code. Follow the instructions in the link below and prepare you first LUIS App.

<https://docs.microsoft.com/en-us/azure/cognitive-services/luis/client-libraries-rest-api?tabs=windows&pivots=programming-language-python>

A Cost Management: Azure subscr X

portal.azure.com/#blade/Microsoft\_Azure\_CostManagement/Menu/costanalysisv3

Microsoft Azure

Search resources, services, and docs (G+/)

Home > Cost Management + Billing > Cost Management: Azure subscription 1

# ATTENTION!

Create a resource

Home

Dashboard

All services

FAVORITES

Resource groups

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Storage accounts

Virtual networks

Azure Active Directory

Monitor

Advisor

Security Center

Cost Management + Bill...

Azure subscriptions

Reservations

Cost analysis (preview)

Cost analysis

Cost alerts

Budgets

Advisor recommendations

Cloudyn

Billing

Invoices

Payment methods

Costs + services

Azure subscriptions

Reservations

Subscription: Azure subscription 1 (change)

Resource groups

Customize Download ...

Filter rows Jun 2021

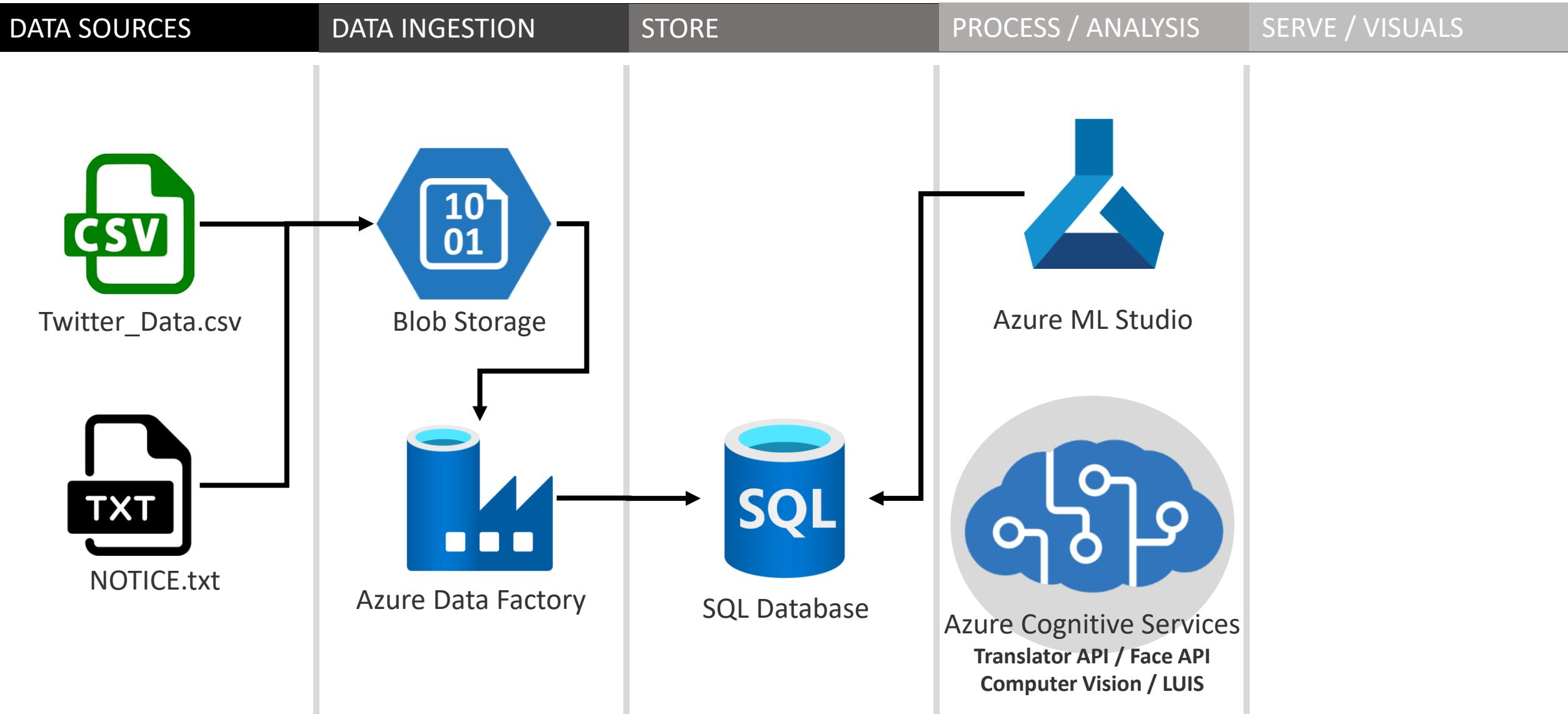
Showing 2 resource groups

| Name                        | Subscription             | Total     |
|-----------------------------|--------------------------|-----------|
| rg-caio-ai                  | azure subscription 1     | R\$181.99 |
| qna-maker-caio              | App Service plan         | R\$55.20  |
| machinelearning-caio        | Machine Learning         | R\$53.14  |
| machinelearning-ai1006      | Machine Learning         | R\$52.51  |
| srv-caio-001 / sql-caio-ai1 | SQL server               | R\$20.64  |
| qna-maker-caio-ai           | Application Insights app | R\$0.42   |
| machinelearnin948838409!    | Storage account          | R\$0.05   |
| bot-handle6                 | Bot Service              | R\$0.02   |
| machinelearnin072001392!    | Storage account          | R\$0.01   |

1 to 2 of 2 | Page 1 of 1 How would you rate the cost analysis preview?

Please do not forget to check your subscription costs.

# Data Architecture so far...



# References

Official Prep Training Exam **AI-102: Designing and Implementing a Microsoft Azure AI Solution**

Azure Portal, <https://portal.azure.com/#home>

Azure **Cognitive Services**, <https://azure.microsoft.com/en-ca/services/cognitive-services/>

Azure **Machine Learning**, <https://azure.microsoft.com/en-ca/services/machine-learning/>

Azure **Machine Learning Studio**, <https://studio.azureml.net/>

**Microsoft Learn**, <https://docs.microsoft.com/en-us/learn/>

**Microsoft Learn**, Course AI-102T00: Designing and Implementing a Microsoft Azure AI Solution,

<https://docs.microsoft.com/en-us/learn/certifications/courses/ai-102t00>

**Microsoft Learn**, AI-102, <https://docs.microsoft.com/en-us/learn/certifications/azure-ai-engineer/>

**Microsoft Learn, Code Samples**, <https://docs.microsoft.com/en-us/samples/browse/>

Microsoft Official **Git Hub**, **AI-Basic examples for all APIs**, <https://github.com/MicrosoftDocs/ai-fundamentals>

Microsoft Official **Git Hub**, **Microsoft learn AI-900**, <https://github.com/MicrosoftLearning/mslearn-ai900>

Microsoft Official **Git Hub**, **Microsoft learn AI-102**, <https://github.com/MicrosoftLearning/AI-102-AIEngineer>

# Thank you! ;-)

Please e-mail me the screenshots of your final steps for each component / service to validate your bonus points.

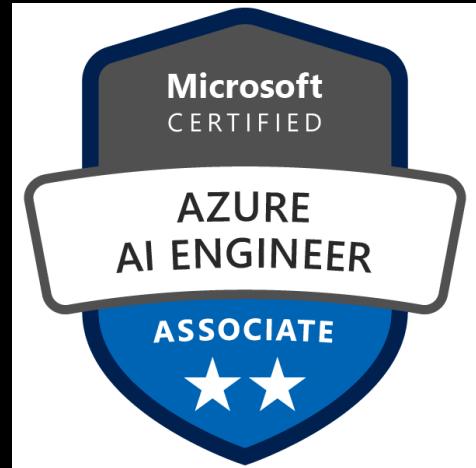
# Challenge #4 // Part 3

## Azure Cognitive Services

### Security

#### IN THIS CHALLENGE:

11. Security Intro
12. Network
13. RBAC and LOCKS
14. Azure Policies
15. Application Registration
16. Exam Sample Questions



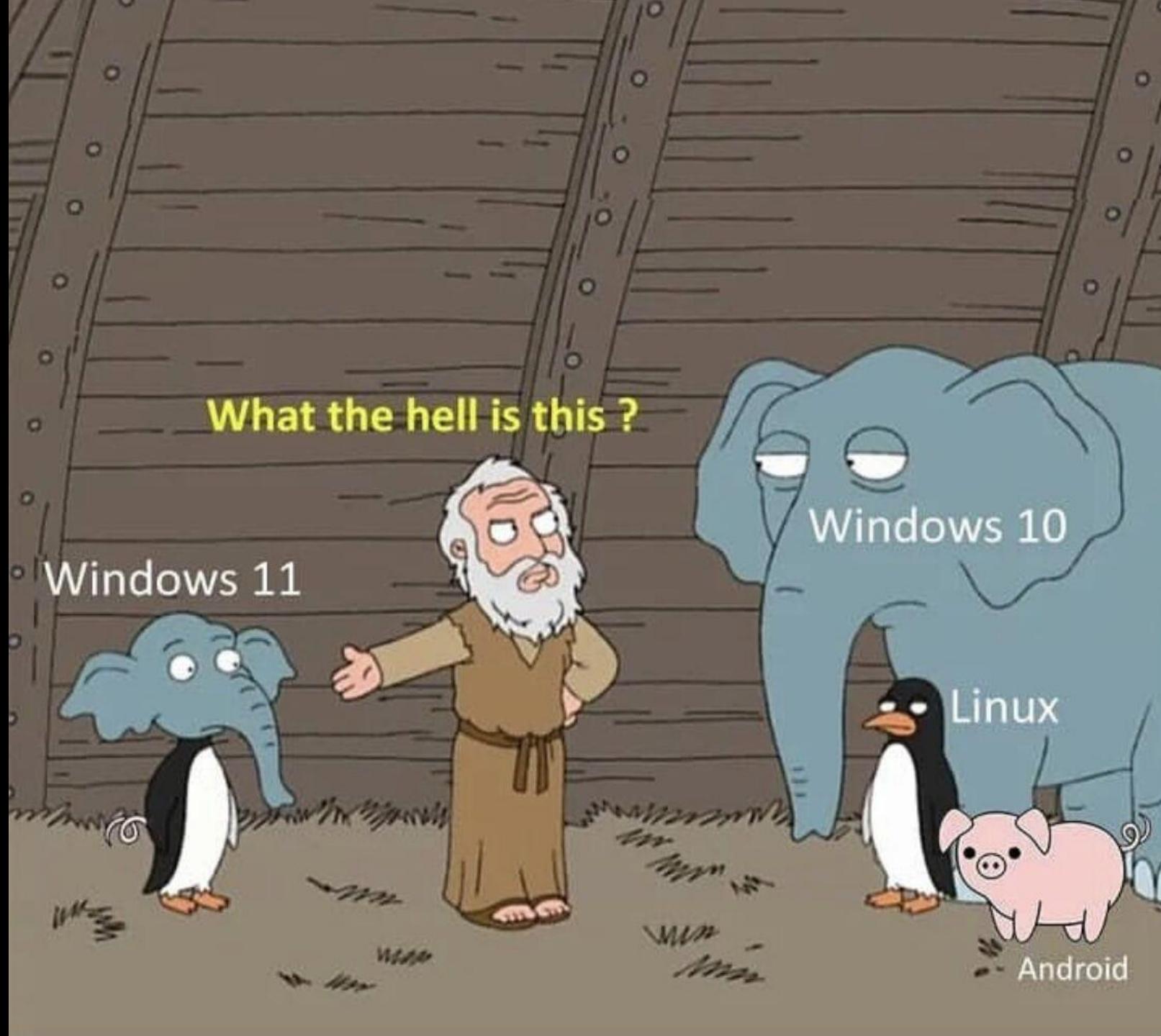
This content is based on the main requirements for AI-102 Certification



# Exam AI-102: Designing and Implementing a Microsoft Azure AI Solution

Candidates for Exam AI-102 should have subject matter expertise building, managing, and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework.

Candidates for this exam should be proficient in C#, Python, or JavaScript and should be able to use REST-based APIs and SDKs to build computer vision, natural language processing, knowledge mining, and conversational AI solutions on Azure. They should also understand the components that make up the Azure AI portfolio and the available data storage options. Plus, candidates need to understand and be able to apply responsible AI principles.



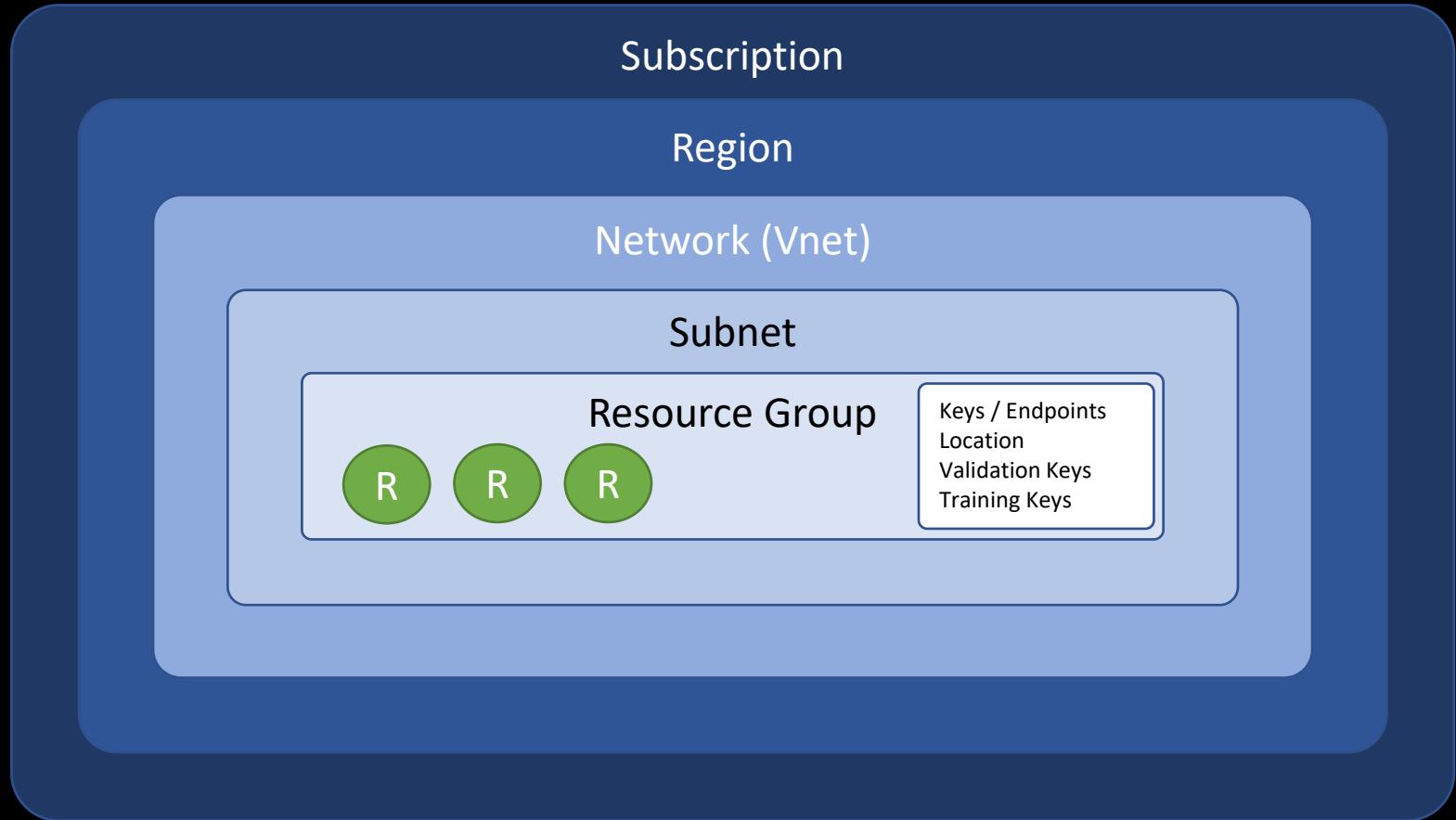
# Before we start there are some important clarifications points:



- (1) Troubleshooting is REALLY important** – It is important for you to find the bugs in your code, env, IDE, etc.
- (2) The code IS JUST a code** – There are several ways to write a code and different languages. The examples here are just one way to do it.
- (3) This IS NOT a prep course** – The main goal here is to show the practical application of the Azure Resources with a focus on Enterprise AI solutions.
- (4) You won't be graded by the challenges** but, they are an important practical component in your learning experience.

Challenge #4.11

Security Intro



The Cognitive Services is linked with the subscription

Challenge #4.12

Networking

portal.azure.com/#home

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Azure services

Create a resource Cost Management ... All resources Subscriptions Data factories SQL databases Quickstart Center Virtual machines App Services More services

Recent resources

| Name                                    | Type               | Last Viewed       |
|-----------------------------------------|--------------------|-------------------|
| speech-ai1006                           | Cognitive Services | a few seconds ago |
| rg-caio-ai                              | Resource group     | 3 minutes ago     |
| language-understanding-ai1006-Authoring | Cognitive Services | 5 minutes ago     |
| Free Trial                              | Subscription       | 52 minutes ago    |
| machinelearning-ai1006                  | Machine learning   | 16 hours ago      |
| machinelearning-caio                    | Machine learning   | 16 hours ago      |
| cognitiveservices-caio                  | Cognitive Services | 4 days ago        |
| translator-caio                         | Cognitive Services | 4 days ago        |
| storageaccountcaio                      | Storage account    | 2 weeks ago       |
| sql-caio-ai1                            | SQL database       | 2 weeks ago       |
| sa-caio-ai1                             | Synapse workspace  | 3 weeks ago       |
| df-caio-001                             | Data factory (V2)  | 4 weeks ago       |

https://portal.azure.com/#@caioquasarine@mail.onmicrosoft.com/asset/Microsoft Azure Pro... https://portal.azure.com/#home

speech-ai1006 - Microsoft Azure

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ 🔍 📈 🚧 🛡️ ? 🔍

Home > speech-ai1006

## speech-ai1006 | Keys and Endpoint

Cognitive Services

Search (Ctrl+ /) Regenerate Key1 Regenerate Key2

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

Keys and Endpoint (selected)

Encryption Pricing tier Networking Identity Billing By Subscription Properties Locks

Monitoring

Alerts

**KEY 1**  
.....

**KEY 2**  
.....

**Location** ⓘ eastus

**Endpoint** <https://eastus.api.cognitive.microsoft.com/sts/v1.0/issuetoken>

These keys are used to access your Cognitive Service API. Do not share your keys. Store them securely— for example, using Azure Key Vault. We also recommend regenerating these keys regularly. Only one key is necessary to make an API call. When regenerating the first key, you can use the second key for continued access to the service.

Show Keys

https://portal.azure.com/#home

A speech-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ 🔍 🌐 🚧 🛡️ ? 🔎

Home > speech-ai1006

## speech-ai1006 | Networking ...

Cognitive Services

Search (Ctrl+/)

Custom Domain Name is required for VNet

Firewalls and virtual networks Private endpoint connections

Save Discard Refresh Generate Custom Domain Name

Allow access from

All networks  Selected Networks and Private Endpoints  Disabled

All networks, including the internet, can access this resource. [Learn more.](#)

Keys and Endpoint  
Encryption  
Pricing tier  
**Networking**  
Identity  
Billing By Subscription  
Properties  
Locks

Monitoring  
Alerts



<https://portal.azure.com/#home>

Generate Custom Domain Name x +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > speech-ai1006

## speech-ai1006 | Networking ...

Cognitive Services

Search (Ctrl+/)

Custom Domain Name is required for VNet

Firewalls and virtual networks Private endpoint connections

Save Discard Refresh Generate Custom Domain Name

Allow access from

All networks Selected Networks and Private Endpoints Disabled

All networks, including the internet, can access this resource. [Learn more.](#)

Generate Custom Domain Name

Enter value for Custom Domain Name \*

ai-1006

Save Save

https://portal.azure.com/#home

The screenshot shows the Microsoft Azure portal interface. On the left, there's a sidebar with various service links like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource Management, Keys and Endpoint, Encryption, Pricing tier, Networking (which is selected), Identity, Billing By Subscription, Properties, Locks, Monitoring, and Alerts. The main content area shows a 'speech-ai1006 | Networking' page under Cognitive Services. A modal window titled 'Generate Custom Domain Name' is overlaid on the page. It has a text input field containing 'ai-1006' with a green checkmark icon at the end. Below the input field are two 'Save' buttons: a blue one on the left and a black one on the right. Two orange arrows point to these buttons. The background shows a warning message: 'Custom Domain Name is required for VNet'.

speech-ai1006 - Microsoft Azure

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > speech-ai1006

speech-ai1006 | Keys and Endpoint Cognitive Services

Search (Ctrl+ /) Regenerate Key1 Regenerate Key2

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

Keys and Endpoint (selected)

Encryption Pricing tier Networking Identity Billing By Subscription Properties Locks

Monitoring

Alerts

**KEY 1**  
..... 

**KEY 2**  
..... 

**Location** ⓘ eastus 

**Endpoint** <https://ai-1006.cognitiveservices.azure.com/sts/v1.0/issuetoken> 

Custom Domain Name 10:42 AM  
Custom Domain Name ai-1006 created successfully for resource speech-ai1006

https://portal.azure.com/#home

Challenge #4.13

RBAC (Role Based Access Control) and Locks

A speech-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ ⓘ 4 🛡 ? 🔍

Home >

speech-ai1006 Cognitive Services

Search (Ctrl+ /) Delete

Help us improve Speech. Take our survey!

Essentials

Resource group (change) : rg-caio-ai API type : Speech  
Status : Active Pricing tier : Free  
Location : East US Endpoint : https://ai-1006.cognitiveservices.azure.com/sts/v1.0/issuetoken  
Subscription (change) : Free Trial Manage keys : Click here to manage keys  
Subscription ID : bf350b48-f641-49a2-b7e4-598ce72df8ab  
Tags (change) : Click here to add tags JSON View

Get Started Discover Develop Deploy

Get Started with Speech Services

The Speech service is the unification of speech-to-text, text-to-speech, speaker recognition, speech translation, and intent recognition into a single Azure subscription.

Learn More

Discover Develop Deploy

https://portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf3... our service in the cloud or on your

https://portal.azure.com/#home

Home > speech-ai1006

## speech-ai1006 | Identity

Cognitive Services

 Search (Ctrl+ /)

System assigned

User assigned

A system assigned managed identity is restricted to one per resource and is tied to the lifecycle of this resource. You can grant permissions to the managed identity by using Azure role-based access control (Azure RBAC). The managed identity is authenticated with Azure AD, so you don't have to store any credentials in code. [Learn more about Managed identities.](#)

 Save  Discard

 Refresh

 Got feedback?

Status 

 Off  On

### Resource Management

 Keys and Endpoint

 Encryption

 Pricing tier

 Networking

 Identity

 Billing By Subscription

 Properties

 Locks

### Monitoring

 Alerts



Microsoft Azure Upgrade Search resources, services, and docs (G+) 4 ? ?

Home > speech-ai1006

## speech-ai1006 | Identity

Cognitive Services

Search (Ctrl + /) « System assigned User assigned 

User assigned managed identities enable Azure resources to authenticate to cloud services (e.g. Azure Key Vault) without storing credentials in code. This type of managed identities are created as standalone Azure resources, and have their own lifecycle. A single resource (e.g. Virtual Machine) can utilize multiple user assigned managed identities. Similarly, a single user assigned managed identity can be shared across multiple resources (e.g. Virtual Machine). [Learn more about Managed identities.](#)

+ Add Remove Refresh Got feedback?

| Name       | resource group | subscription |
|------------|----------------|--------------|
| No results |                |              |

 No user assigned managed identities found on this resource

Add user assigned managed identity

**Role based access control**  
**W – R – Subscription level**  
**Resource Group Level Permission**

<https://portal.azure.com/#home>

speech-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveServices/accounts/speech-ai1006/locks

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ 🔍 4 🚧 ⚙️ ? 🔍

Home > speech-ai1006

## speech-ai1006 | Locks

Cognitive Services

Search (Ctrl+ /) « Add Resource group Subscription Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

- Keys and Endpoint
- Encryption
- Pricing tier
- Networking
- Identity
- Billing By Subscription
- Properties
- Locks**

Monitoring

- Alerts

This resource has no locks.



<https://portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveServices/accounts/speech-ai1006/locks>

<https://portal.azure.com/#home>

speech-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > speech-ai1006

## speech-ai1006 | Locks

Cognitive Services

Search (Ctrl+ /) Add Resource group Subscription Refresh

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Resource Management

Keys and Endpoint Encryption Pricing tier Networking Identity Billing By Subscription Properties Locks

Add lock

Lock name: no-delete Lock type: Read-only Notes: just a test

OK Cancel

Locks

**Read-Only** – Cannot be deleted and cannot be updated.

**Delete** – Cannot be deleted but can be updated.

https://portal.azure.com/#home

A speech-ai1006 - Microsoft Azure +

portal.azure.com/#@caiogasparinegmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/providers/Microsoft.CognitiveSer... 🔒 ⭐

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) ☰ ⓘ 4 ⓘ ? 🔍

Home >

speech-ai1006 Cognitive Services

Search (Ctrl+/)

Delete

Delete

Help us improve Speech. Take our survey!

Essentials

Resource group (change) : rg-caio-ai API type : Speech  
Status : Active Pricing tier : Free  
Location : East US Endpoint : https://ai-1006.cognitiveservices.azure.com/sts/v1.0/issuetoken  
Subscription (change) : Free Trial Manage keys : Click here to manage keys  
Subscription ID : bf350b48-f641-49a2-b7e4-598ce72df8ab  
Tags (change) : Click here to add tags

JSON View

Get Started Discover Develop Deploy

Get Started with Speech Services

The Speech service is the unification of speech-to-text, text-to-speech, speaker recognition, speech translation, and intent recognition into a single Azure subscription.

Learn More

Discover

Whether running our service in the cloud or on your

Develop

Learn the basics, check out our sample code and

Deploy

Decide on hosting options, monitor your usage and

https://portal.azure.com/#home

**Challenge #4.14**

**Azure Policy**

# What is Azure Policy?

Azure Policy helps to enforce organizational standards and to assess compliance at-scale. Through its compliance dashboard, it provides an aggregated view to evaluate the overall state of the environment, with the ability to drill down to the per-resource, per-policy granularity. It also helps to bring your resources to compliance through bulk remediation for existing resources and automatic remediation for new resources.

Common use cases for Azure Policy include implementing governance for resource consistency, regulatory compliance, security, cost, and management. Policy definitions for these common use cases are already available in your Azure environment as built-ins to help you get started.

All Azure Policy data and objects are encrypted at rest.

Home - Microsoft Azure

portal.azure.com/#home

Microsoft Azure

Upgrade

Search: pol

Azure services

Services

- Policy
- Firewall Policies
- Service endpoint policies
- PokitDok Platform
- Application gateways
- Application groups
- Application Insights
- Application Services
- Web Application Firewall policies (WAF)
- Application Change Analysis

Recent resources

Name

- speech
- rg-caio-ai1
- language
- Free Trial
- machin
- machin
- cognit
- translat

Resources

No results were found.

Didn't find what you were looking for?

- Try searching in Activity Log
- Try searching in Azure Active Directory

Searching all subscriptions. [Change](#)

Marketplace

See all

- Datree Policy
- VMware NSX - Policy Manager
- Aruba ClearPass Policy Manager (CPPM)
- Web Application Firewall (WAF)

Documentation

See all

- Quickstart: New policy assignment with portal - Azure ...
- Quickstart: New policy assignment with templates - Azure ...
- Built-in policy definitions for Azure Security Center ...
- Details of the policy assignment structure - Azure Policy ...

Resource Groups

No results were found.

Storage account

SQL database

Synapse workspace

Data factory (V2)

2 weeks ago

2 weeks ago

3 weeks ago

4 weeks ago

More services →

Services

Documentation

Resource Groups

Storage account

SQL database

Synapse workspace

Data factory (V2)

2 weeks ago

2 weeks ago

3 weeks ago

4 weeks ago

Policy - Microsoft Azure

portal.azure.com/#blade/Microsoft\_Azure\_Policy/PolicyMenuBlade/Overview

Microsoft Azure    Upgrade    Search resources, services, and docs (G+)

Home > Policy

Search (Ctrl + /)    Scope: Free Trial

Get notified of compliance state changes! Use event-based architecture to react to notifications with an Azure Function, Logic App, or any other supported event handler. Learn more <https://aka.ms/policyPlusEventGrid>

Overall resource compliance: 0% (0 out of 22)

Resources by compliance state:

- 0 - Compliant
- 0 - Exempt
- 22 - Non-compliant

Non-compliant initiatives: 1 out of 1

Non-compliant policies: 65 out of 199

LEARN MORE: [Learn about Policy](#) [Onboarding tutorial](#)

| Name                                  | Scope      | Compliance state | Resource compli... | Non-Compliant Resources | Non-compliant policies |
|---------------------------------------|------------|------------------|--------------------|-------------------------|------------------------|
| ASC Default (subscription: bf350b...) | Free Trial | Non-compliant    | 0% (0 out of 22)   | 22                      | 65                     |

View all

ASSIGNMENTS BY COMPLIANCE (LAST 7 DAYS)

ASC Default...

20  
15

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>

ASC Default (subscription: bf350b48-f641-49a2-b7e4-598ce72df8ab) + portal.azure.com/#blade/Microsoft\_Azure\_Policy/InitiativeComplianceDetailedBlade/id/%2Fsubscriptions%2Fbf350b48-f641-49a2-b7e4-598ce72df8ab%2Fproviders%2FMicrosoft.Authorization... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > Policy >

## ASC Default (subscription: bf350b48-f641-49a2-b7e4-598ce72df8ab)

Initiative compliance

View definition Edit assignment Assign to another scope Delete assignment Create Remediation Task Create exemption

Essentials

Name : ASC Default (subscription: bf350b48-f641-49a2-b7e4-598ce72df8ab) Scope : Free Trial  
Description : This is the default set of policies monitored by Azure Security Center. It was automatically assigned a... Excluded scopes : --  
Assignment ID : /subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/providers/Microsoft.Authorization/policyAs... Definition : Azure Security Benchmark

Selected Scopes ①

1 selected subscription

Compliance state ① Non-compliant

Overall resource compliance ① 0% 0 out of 22

Resources by compliance state ① 22

- 0 - Compliant
- 0 - Exempt
- 22 - Non-compliant

Non-compliant policies ① 65 out of 199

Groups Policies Non-compliant resources Events

Filter by group name...

Subgroup : All subgroups Compliance state : 7 selected

| Name ↑↓                                                 | Compliance ↑↓ | Subgroup ↑↓      | Non-compliant policies ↑↓ | Total policies ↑↓ |
|---------------------------------------------------------|---------------|------------------|---------------------------|-------------------|
| <a href="#">Implement security for internal traffic</a> | Non-compliant | Network Security | 13                        | 13                |
| <a href="#">...</a>                                     | Non-compliant | ...              | 10                        | 10                |

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>

ASC Default (subscription: bf350b48-f641-49a2-b7e4-598ce72df8ab) +

portal.azure.com/#blade/Microsoft\_Azure\_Policy/InitiativeComplianceDetailedBlade/id/%2Fsubscriptions%2Fbf350b48-f641-49a2-b7e4-598ce72df8ab%2Fproviders%2FMicrosoft.Authorizati... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > Policy >

## ASC Default (subscription: bf350b48-f641-49a2-b7e4-598ce72df8ab)

Initiative compliance

View definition Edit assignment Assign to another scope Delete assignment Create Remediation Task Create exemption

Compliance state Non-compliant Overall resource compliance 0% 0 out of 22 Resources by compliance state 22 Non-compliant policies 65 out of 199

Groups Policies Non-compliant resources Events

Filter by group name... Subgroup : All subgroups Compliance state : 7 selected

| Name ↑↓                                                                | Compliance ↑↓   | Subgroup ↑↓                  | Non-compliant policies ↑↓ | Total policies ↑↓ |
|------------------------------------------------------------------------|-----------------|------------------------------|---------------------------|-------------------|
| Implement security for internal traffic                                | ✗ Non-compliant | Network Security             | 13                        | 13                |
| Enable threat detection for Azure resources                            | ✗ Non-compliant | Logging and Threat Detection | 10                        | 10                |
| Enable threat detection for Azure identity and access management       | ✗ Non-compliant | Logging and Threat Detection | 10                        | 10                |
| Detection and analysis - create incidents based on high quality alerts | ✗ Non-compliant | Incident Response            | 10                        | 10                |
| Detection and analysis - prioritize incidents                          | ✗ Non-compliant | Incident Response            | 10                        | 10                |
| Protect applications and services from external network attacks        | ✗ Non-compliant | Network Security             | 8                         | 8                 |
| Protect sensitive data                                                 | ✗ Non-compliant | Data Protection              | 6                         | 6                 |
| Review and reconcile user access regularly                             | ✗ Non-compliant | Privileged Access            | 5                         | 5                 |

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>

**Challenge #4.15**

**Application Registration**

# What is App Registration?

Azure App Registrations are an easy and powerful way to configure authentication and authorization workflows for a variety of different client types.

Applications are added to Azure AD to leverage one or more of the services it provides, including:

- (1) App authentication and authorization
- (2) User authentication and authorization
- (3) OAuth authorization services // used by Microsoft 365 and other MS applications to authorize access to API and resources

All resources - Microsoft Azure

portal.azure.com/#blade/HubsExtension/BrowseAll

Create a resource

Home

Dashboard

All services

**FAVORITES**

- All resources
- Resource groups
- App Services
- Function App
- SQL databases
- Azure Cosmos DB
- Virtual machines
- Load balancers
- Storage accounts
- Virtual networks
- Azure Active Directory**
- Monitor
- Advisor
- Security Center
- Cost Management + Bill...
- Help + support

Upgrade

Search resources, services, and docs (G+)

Refresh Export to CSV Open query Feedback Assign tags Delete

subscription == all Resource group == all Type == all Location == all Add filter

Show hidden types

No grouping List view

| Type ↑↓            | Resource group ↑↓    | Location ↑↓  | Subscription ↑↓ |            |
|--------------------|----------------------|--------------|-----------------|------------|
| Cognitive Services | rg-caio-ai           | Brazil South | Free Trial      |            |
| Data factory (V2)  | rg-caio-ai           | Brazil South | Free Trial      |            |
| Storage account    | rg-caio-ai           | Brazil South | Free Trial      |            |
| i1006              | Cognitive Services   | rg-caio-ai   | East US         | Free Trial |
| i1006-Authoring    | Cognitive Services   | rg-caio-ai   | West US         | Free Trial |
| 8                  | Storage account      | rg-caio-ai   | Brazil South    | Free Trial |
| 3                  | Application Insights | rg-caio-ai   | Brazil South    | Free Trial |
| 3                  | Application Insights | rg-caio-ai   | Brazil South    | Free Trial |
| 3                  | Key vault            | rg-caio-ai   | Brazil South    | Free Trial |
| 3                  | Key vault            | rg-caio-ai   | Brazil South    | Free Trial |
| 3                  | Storage account      | rg-caio-ai   | Brazil South    | Free Trial |

Azure Active Directory ★

View

Free training from Microsoft

OpenID Conn...

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>



A Default Directory - Microsoft Azure +

portal.azure.com/#blade/Microsoft\_AAD\_IAM/ActiveDirectoryMenuBlade/Overview

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Default Directory | Overview

Switch tenant Delete tenant Create a tenant What's new Preview features Got feedback?

Azure Active Directory can help you enable remote work for your employees and partners. [Learn more](#)

## Default Directory

Search your tenant

**Tenant information**

Your role: Global administrator [More info](#)

License: Azure AD Free

Tenant ID: 362067a6-2936-460f-ae05-bf26...

Primary domain: caiogasparinegmai.onmicrosoft.com

**Azure AD Connect**

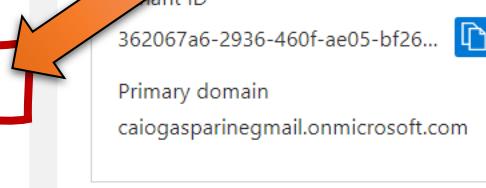
Status: Not enabled

Last sync: Sync has never run

Sign-ins: 7, 6, 5

Manage

- Overview
- Getting started
- Preview features
- Diagnose and solve problems
- Users
- Groups
- External Identities
- Roles and administrators
- Administrative units
- Enterprise applications
- Devices
- App registrations**
- Identity Governance
- Application proxy
- Licenses
- Azure AD Connect



Default Directory - Microsoft Azure +

portal.azure.com/#blade/Microsoft\_AAD\_IAM/ActiveDirectoryMenuBlade/RegisteredApps

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Default Directory

## Default Directory | App registrations

Azure Active Directory

+ New registration Endpoints Troubleshooting Refresh Download Preview features Got feedback?

Try out the new App registrations search preview! Click to enable the preview. →

Starting June 30th, 2020 we will no longer add any new features to Azure Active Directory Authentication Library (ADAL) and Azure AD Graph. We will continue to provide technical support and security updates but we will no longer provide feature updates. Applications will need to be upgraded to Microsoft Authentication Library (MSAL) and Microsoft Graph. Learn more

All applications Owned applications Deleted applications (Preview) Applications from personal account

Start typing a name or Application ID to filter these results

This account isn't listed as an owner of any applications in this directory.

[View all applications in the directory](#)

[View all applications from personal account](#)

Manage

- Users
- Groups
- External Identities
- Roles and administrators
- Administrative units
- Enterprise applications
- Devices
- App registrations
- Identity Governance
- Application proxy
- Licenses
- Azure AD Connect

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>

https://portal.azure.com/#blade/Microsoft\_AAD\_IAM/ActiveDirectoryMenuBlade/Registered...

Register an application - Microsoft Azure +

portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/CreateApplicationBlade/quickStartType//isMSAApp/

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Home > Default Directory >

## Register an application

\* Name

The user-facing display name for this application (this can be changed later).

my-new-application-registered 

Supported account types

Who can use this application or access this API?

Accounts in this organizational directory only (Default Directory only - Single tenant)  
 Accounts in any organizational directory (Any Azure AD directory - Multitenant)  
 Accounts in any organizational directory (Any Azure AD directory - Multitenant) and personal Microsoft accounts (e.g. Skype, Xbox)  
 Personal Microsoft accounts only

[Help me choose...](#)

Redirect URI (optional)

We'll return the authentication response to this URI after successfully authenticating the user. Providing this now is optional and it can be changed later, but a value is required for most authentication scenarios.

By proceeding, you agree to the Microsoft Platform Policies [↗](#)

**Register** 

my-new-application-registered - + portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Overview/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b2569245f... ?

Microsoft Azure Upgrade Search resources, services, and docs (G+) Cloud Help Feedback ? Preview

Home > Default Directory >

# my-new-application-registered

Search (Ctrl+ /) Delete Endpoints Preview features

Got a second? We would love your feedback on Microsoft identity platform (previously Azure AD for developer). →

**Essentials**

|                         |                                        |                             |                                 |
|-------------------------|----------------------------------------|-----------------------------|---------------------------------|
| Display name            | : my-new-application-registered        | Client credentials          | : Add a certificate or secret   |
| Application (client) ID | : ca13eebc-91b6-4f27-b665-812b2569245f | Redirect URIs               | : Add a Redirect URI            |
| Object ID               | : 9626c280-40b3-45ad-8ff6-a645343508de | Application ID URI          | : Add an Application ID URI     |
| Directory (tenant) ID   | : 362067a6-2936-460f-ae05-bf263cebe940 | Managed application in I... | : my-new-application-registered |
| Supported account types | : My organization only                 |                             |                                 |

Welcome to the new and improved App registrations. Looking to learn how it's changed from App registrations (Legacy)? [Learn more](#) X

Starting June 30th, 2020 we will no longer add any new features to Azure Active Directory Authentication Library (ADAL) and Azure AD Graph. We will continue to provide technical support and security updates but we will no longer provide feature updates. Applications will need to be upgraded to Microsoft Authentication Library (MSAL) and Microsoft Graph. [Learn more](#) X

[Get Started](#) [Documentation](#)

**Build your application with the Microsoft identity platform**

The Microsoft identity platform is an authentication service, open-source libraries, and application management tools. You can create modern, standards-based authentication solutions, access and protect APIs, and add sign-in for your users and customers. [Learn more](#) X







my-new-application-registered - + portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Credentials/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b256924... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Default Directory > my-new-application-registered

## my-new-application-registered | Certificates & secrets

Search (Ctrl +/)

Got feedback?

Credentials enable confidential applications to identify themselves to the authentication service when receiving tokens at a web addressable location (using an HTTPS scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.

### Certificates

Certificates can be used as secrets to prove the application's identity when requesting a token. Also can be referred to as public keys.

Upload certificate

| Thumbprint                                            | Start date | Expires | Certificate ID |
|-------------------------------------------------------|------------|---------|----------------|
| No certificates have been added for this application. |            |         |                |

### Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

New client secret

| Description                                               | Expires | Value | Secret ID |
|-----------------------------------------------------------|---------|-------|-----------|
| No client secrets have been created for this application. |         |       |           |



Add a client secret - Microsoft A<sub>Z</sub> +

portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Credentials/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b256924... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > Default Directory > my-new-application-registered

## my-new-application-registered | Certificates & secrets

Search (Ctrl +/)

Got feedback?

Credentials enable confidential applications to identify themselves to the authentication service when receiving token scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.

### Certificates

Certificates can be used as secrets to prove the application's identity when requesting a token. Also can be referred to as app

Upload certificate

| Thumbprint                                            | Start date | Expires |
|-------------------------------------------------------|------------|---------|
| No certificates have been added for this application. |            |         |

### Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as app

New client secret

| Description                                               | Expires | Value |
|-----------------------------------------------------------|---------|-------|
| No client secrets have been created for this application. |         |       |

Add Cancel

Add a client secret

Description

Expires

secret-1

Recommended: 6 months

Recommended: 6 months

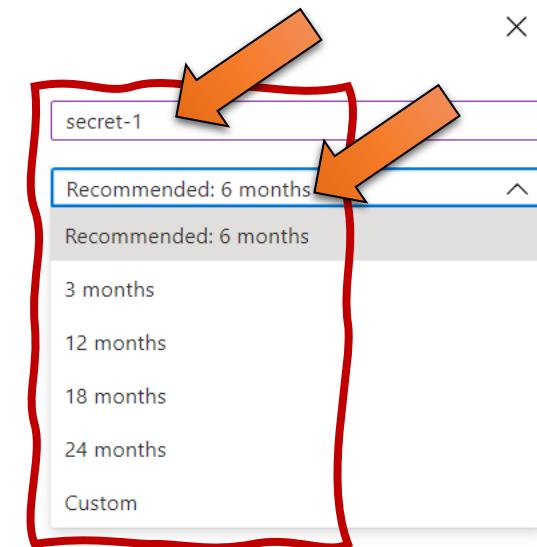
3 months

12 months

18 months

24 months

Custom



Add a client secret - Microsoft A<sub>Z</sub> +

portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Credentials/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b256924... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+/-)

Home > Default Directory > my-new-application-registered

## my-new-application-registered | Certificates & secrets

Search (Ctrl +/)

Got feedback?

Credentials enable confidential applications to identify themselves to the authentication service when receiving token scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.

### Certificates

Certificates can be used as secrets to prove the application's identity when requesting a token. Also can be referred to as app

Upload certificate

| Thumbprint                                            | Start date | Expires |
|-------------------------------------------------------|------------|---------|
| No certificates have been added for this application. |            |         |

### Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as app

New client secret

| Description                                               | Expires | Value |
|-----------------------------------------------------------|---------|-------|
| No client secrets have been created for this application. |         |       |

Add Cancel

Add a client secret

Description

Expires

secret-1

Recommended: 6 months

Recommended: 6 months

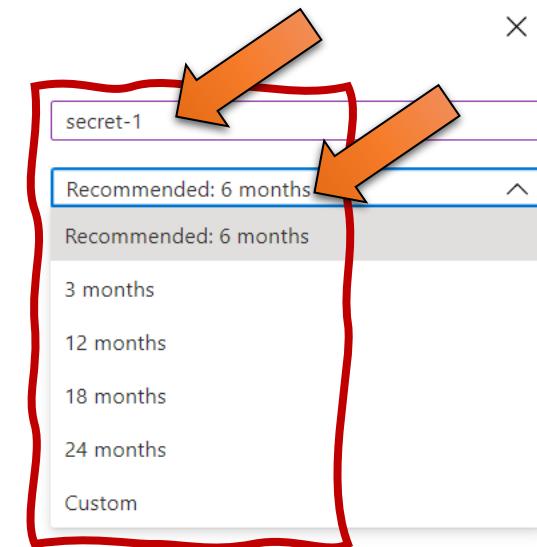
3 months

12 months

18 months

24 months

Custom



my-new-application-registered - + portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Credentials/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b256924... 3

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Default Directory > my-new-application-registered

## my-new-application-registered | Certificates & secrets

Search (Ctrl + /) Got feedback?

Credentials enable confidential applications to identify themselves to the authentication service when receiving tokens at a web addressable location (using an HTTPS scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.

### Certificates

Certificates can be used as secrets to prove the application's identity when requesting a token. Also can be referred to as public keys.

Upload certificate

| Thumbprint                                            | Start date | Expires | Certificate ID |
|-------------------------------------------------------|------------|---------|----------------|
| No certificates have been added for this application. |            |         |                |

### Client secrets

A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.

New client secret

| Description | Expires    | Value                              | Secret ID                            |
|-------------|------------|------------------------------------|--------------------------------------|
| secret-1    | 12/15/2021 | JHQdI6VPI59Y1VeCc2Xo9.e.o5l-y0Vq-i | 4cabfe0d-f3a3-4240-ad4f-725e9e59ce44 |

https://portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Ma... <https://docs.microsoft.com/en-us/azure/governance/policy/overview>

my-new-application-registered - + portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b2569245f... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Default Directory > my-new-application-registered

## my-new-application-registered | API permissions

Search (Ctrl + /) Refresh Got feedback?

The "Admin consent required" column shows the default value for an organization. However, user consent can be customized per permission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. [Learn more](#)

**Configured permissions**

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. [Learn more about permissions and consent](#)

+ Add a permission  Grant admin consent for Default Directory

| API / Permissions name | Type      | Description                   | Admin consent requ... | Status |
|------------------------|-----------|-------------------------------|-----------------------|--------|
| Microsoft Graph (1)    |           |                               |                       |        |
| User.Read              | Delegated | Sign in and read user profile | No                    | ...    |

To view and manage permissions and user consent, try [Enterprise applications](#).

API permissions

Expose an API

App roles

Owners

Roles and administrators | Pre...

Manifest

Support + Troubleshooting

Troubleshooting

[https://portal.azure.com/#blade/Microsoft\\_AAD\\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/quickStartType//sourceType/Microsoft\\_AAD\\_IAM/appId/ca13eebc-91b6-4f27-b665-812b2569245f/objectId/9626c280-40b3-45ad-8ff6-a645343508de/isMSAApp//defaultBlade/Overview](https://portal.azure.com/#blade/Microsoft_AAD_RegisteredApps/ApplicationMenuBlade/CallAnAPI/quickStartType//sourceType/Microsoft_AAD_IAM/appId/ca13eebc-91b6-4f27-b665-812b2569245f/objectId/9626c280-40b3-45ad-8ff6-a645343508de/isMSAApp//defaultBlade/Overview)

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>

A Request API permissions - Micros x +

portal.azure.com/#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/quickStartType//sourceType/Microsoft\_AAD\_IAM/appId/ca13eebc-91b6-4f27-b665-812b2569245f... ☆

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Default Directory > my-new-application-registered

## my-new-application-registered | API permissions

Search (Ctrl +/)

Refresh Got feedback?

The "Admin consent required" column shows the default value for an organization. However, user consent can be customized per permission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. [Learn more](#)

### Configured permissions

Applications are authorized to call APIs when they are granted permission to all the permissions the application needs. [Learn more about permissions](#)

Add a permission Grant admin consent for Default Direct

| API / Permissions name | Type      | Description      |
|------------------------|-----------|------------------|
| Microsoft Graph (1)    | Delegated | Sign in and read |
| User.Read              |           |                  |

To view and manage permissions and user consent, try [Enterprise app](#)

API permissions

Expose an API

App roles

Owners

Roles and administrators | Pre...

Manifest

Support + Troubleshooting

Troubleshooting

[https://developer.microsoft.com/graph/docs/concepts/permissions\\_reference](https://developer.microsoft.com/graph/docs/concepts/permissions_reference)

## Request API permissions

### Microsoft Graph

<https://graph.microsoft.com/> [Docs](#)

What type of permissions does your application require?

Delegated permissions Your application needs to access the API as the signed-in user.

Application permissions Your application runs as a background service or daemon without a signed-in user.

Select permissions

Start typing a permission to filter these results

The "Admin consent required" column shows the default value for an organization. However, user consent can be customized per permission, user, or app. This column may not reflect the value in your organization, or in organizations where this app will be used. [Learn more](#)

| Permission                                                               | Admin consent required |
|--------------------------------------------------------------------------|------------------------|
| Openid permissions                                                       |                        |
| <input type="checkbox"/> email <a href="#">View users' email address</a> | No                     |

Update permissions Discard

<https://docs.microsoft.com/en-us/azure/governance/policy/overview>

Challenge #4.16

AI-102 // Sample Questions

# AI 100 / AI 102 - Sample Questions



You need to build a chatbot that meets the following requirements:

- ⦿ Supports chit-chat, knowledge base, and multilingual models
- ⦿ Performs sentiment analysis on user messages
- ⦿ Selects the best language model automatically

What should you integrate into the chatbot?

- A. QnA Maker, Language Understanding, and Dispatch
- B. Translator, Speech, and Dispatch
- C. Language Understanding, Text Analytics, and QnA Maker
- D. Text Analytics, Translator, and Dispatch

# AI 100 / AI 102 - Sample Questions



Your company wants to reduce how long it takes for employees to log receipts in expense reports. All the receipts are in English.

You need to extract top-level information from the receipts, such as the vendor and the transaction total. The solution must minimize development effort.

Which Azure Cognitive Services service should you use?

A. Custom Vision

B. Personalizer

C. Form Recognizer

D. Computer Vision

# AI 100 / AI 102 - Sample Questions



You are developing a new sales system that will process the video and text from a public-facing website.

You plan to monitor the sales system to ensure that it provides equitable results regardless of the user's location or background.

Which two responsible AI principles provide guidance to meet the monitoring requirements? Each correct answer presents part of the solution. (Choose two.)

NOTE: Each correct selection is worth one point.

- A. transparency
- B. fairness
- C. inclusiveness
- D. reliability and safety
- E. privacy and security

# AI 100 / AI 102 - Sample Questions



You have the following C# method for creating Azure Cognitive Services resources programmatically.

```
static void create_resource(CognitiveServicesManagementClient client, string
resource_name, string kind, string account_tier, string location)
{
 CognitiveServicesAccount parameters =
 new CognitiveServicesAccount(null, null, kind, location, resource_name,
new CognitiveServicesAccountProperties(), new Sku(account_tier));
 var result = client.Accounts.Create(resource_group_name, account_tier,
parameters);
}
```

You need to call the method to create a free Azure resource in the West US Azure region. The resource will be used to generate captions of images automatically.

Which code should you use?

- A. create\_resource(client, "res1", "ComputerVision", "F0", "westus")
- B. create\_resource(client, "res1", "CustomVision.Prediction", "F0", "westus")
- C. create\_resource(client, "res1", "ComputerVision", "S0", "westus")
- D. create\_resource(client, "res1", "CustomVision.Prediction", "S0", "westus")

# AI 100 / AI 102 - Sample Questions



You successfully run the following HTTP request.

```
POST https://management.azure.com/subscriptions/18c51a87-3a69-47a8-aedc-a54745f708a1/resourceGroups/RG1/providers/
Microsoft.CognitiveServices/accounts/contosol/regenerateKey?api-version=2017-04-18
```

```
Body("keyName": "Key2")
```

What is the result of the request?

- A. A key for Azure Cognitive Services was generated in Azure Key Vault.
- B. A new query key was generated.
- C. The primary subscription key and the secondary subscription key were rotated.
- D. The secondary subscription key was reset.

Accounts - Regenerate Key  
regenerates the specified  
account key for the specified  
Cognitive Services account.

Syntax:  
POST

```
https://management.azure.com/
subscriptions/{subscriptionId}/re
sourceGroups/{resourceGroupName}/providers/Microsoft.Cognitiv
eServices/accounts/
{accountName}/regenerateKey?
api-version=2017-04-18
```

Reference:

<https://docs.microsoft.com/en-us/rest/api/cognitiveservices/accountmanagement/accounts/regeneratekey>

# AI 100 / AI 102 - Sample Questions



You build a custom Form Recognizer model.

You receive sample files to use for training the model as shown in the following table.

| Name  | Type | Size   |
|-------|------|--------|
| File1 | PDF  | 20 MB  |
| File2 | MP4  | 100 MB |
| File3 | JPG  | 20 MB  |
| File4 | PDF  | 100 MB |
| File5 | GIF  | 1 MB   |
| File6 | JPG  | 40 MB  |

Which three files can you use to train the model? Each correct answer presents a complete solution. (Choose three.)

NOTE: Each correct selection is worth one point.

- A. File1
- B. File2
- C. File3
- D. File4
- E. File5
- F. File6

Form Recognizer works on input documents that meet these requirements:

Format must be JPG, PNG, PDF (text or scanned), or TIFF. Text-embedded PDFs are best because there's no possibility of error in character extraction and location.

File size must be less than 50 MB.

Reference:

<https://docs.microsoft.com/en-us/azure/cognitive-services/form-recognizer/overview>

# AI 100 / AI 102 - Sample Questions



You have a Video Indexer service that is used to provide a search interface over company videos on your company's website.

You need to be able to search for videos based on who is present in the video.

What should you do?

---

A. Create a person model and associate the model to the videos.

---

B. Create person objects and provide face images for each object.

•

C. Invite the entire staff of the company to Video Indexer.

D. Edit the faces in the videos.

E. Upload names to a language model.

# AI 100 / AI 102 - Sample Questions



DRAG DROP -

You are developing a call to the Face API. The call must find similar faces from an existing list named employefaces. The employefaces list contains 60,000 images.

How should you complete the body of the HTTP request? To answer, drag the appropriate values to the correct targets. Each value may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.

Select and Place:

## Values

"faceListId"

"LargeFaceListId"

"matchFace"

"matchPerson"

## Answer Area

```
{
 "faceId": "18c51a87-3a69-47a8-aedc-a54745f708a1",
 "LargeFaceListId" : "employefaces",
 "maxNumOfCandidatesReturned": 1,
 "mode": "matchFace"
}
```

# AI 100 / AI 102 - Sample Questions



DRAG DROP .

You are developing a photo application that will find photos of a person based on a sample image by using the Face API.

You need to create a POST request to find the photos.

How should you complete the request? To answer, drag the appropriate values to the correct targets. Each value may be used once, more than once, or not at all.

You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.

Select and Place:

## Values

detect  
findsimilar  
group  
identify  
matchFace  
matchPerson  
verify

## Answer Area

```
POST {Endpoint}/face/v1.0/ detect
Request Body

{
 "faceId": "c5c24a82-6845-4031-9d5d-978df9175426",
 "largeFaceListId": "sample_list",
 "largeFaceListId": "sample_list",
 "maxNumOfCandidatesReturned": 10,
 "mode": " matchPerson "
}
```

# AI 100 / AI 102 - Sample Questions



You develop a test method to verify the results retrieved from a call to the Computer Vision API. The call is used to analyze the existence of company logos in images. The call returns a collection of brands named brands.

You have the following code segment.

```
foreach (var brand in brands)
{
 if (brand.Confidence >= .75)
 Console.WriteLine($"Logo of {brand.Name} between {brand.Rectangle.X},
(brand.Rectangle.Y) and (brand.Rectangle.W), (brand.Rectangle.H)");
}
```

For each of the following statements, select Yes if the statement is true. Otherwise, select No.

NOTE: Each correct selection is worth one point.

<https://docs.microsoft.com/en-us/azure/cognitive-services/computer-vision/concept-brand-detection>

## Answer Area

### Statements

Yes      No

The code will return the name of each detected brand with a confidence equal to or higher than 75 percent.

The code will return coordinates for the bottom-left corner of the rectangle that contains the brand logo of the displayed brands.

The code will return coordinates for the bottom-right corner of the rectangle that contains the brand logo of the displayed brands.



You are designing an AI solution that will analyze millions of pictures.

You need to recommend a solution for storing the pictures. The solution must minimize costs.

Which storage solution should you recommend?

- A. an Azure Data Lake store
- B. Azure File Storage
- C. Azure Blob storage
- D. Azure Table storage

# AI 100 / AI 102 - Sample Questions



You need to build an interactive website that will accept uploaded images, and then ask a series of predefined questions based on each image.

Which services should you use? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Hot Area:

Dynamically ask questions based  
on an uploaded image:

|                               |
|-------------------------------|
| Azure Analysis Services       |
| Azure Bot Service             |
| Azure Data Factory            |
| Azure Linguistic Analysis API |

Analyze and classify an image:

|                    |
|--------------------|
| Bing Image Search  |
| Bing Visual Search |
| Computer Vision    |
| Video Indexer      |

# AI 100 / AI 102 - Sample Questions



Your company has 1,000 AI developers who are responsible for provisioning environments in Azure. You need to control the type, size, and location of the resources that the developers can provision. What should you use?

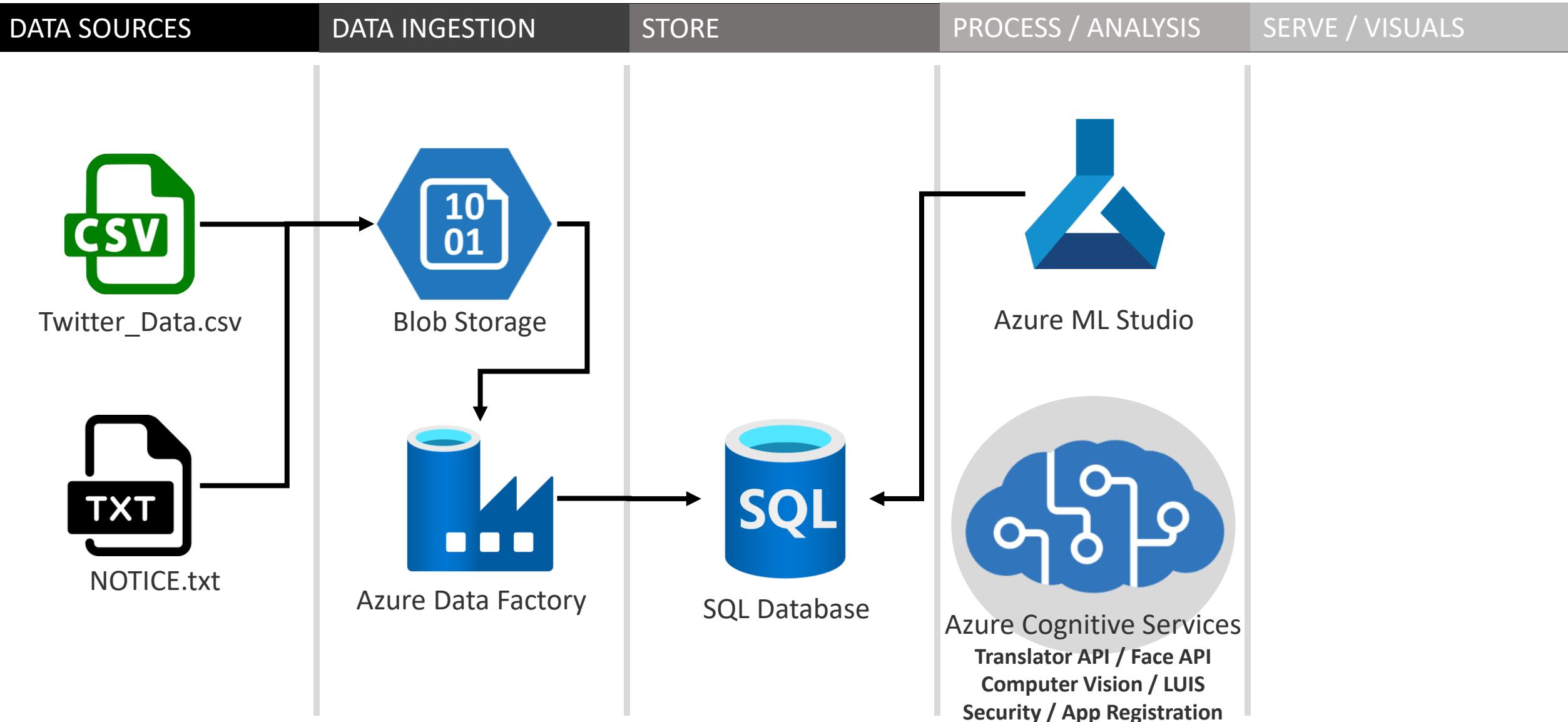
- A. Azure Key Vault
- B. Azure service principals**
- C. Azure managed identities
- D. Azure Security Center
- E. Azure Policy

When an application needs access to deploy or configure resources through Azure Resource Manager in Azure Stack, you create a service principal, which is a credential for your application. You can then delegate only the necessary permissions to that service principal.

References:

<https://docs.microsoft.com/en-us/azure/azure-stack/azure-stack-create-service-principals>

# Data Architecture so far...



# References

Official Prep Training Exam **AI-102: Designing and Implementing a Microsoft Azure AI Solution**

Azure Portal, <https://portal.azure.com/#home>

Azure **Cognitive Services**, <https://azure.microsoft.com/en-ca/services/cognitive-services/>

Azure **Machine Learning**, <https://azure.microsoft.com/en-ca/services/machine-learning/>

Azure **Machine Learning Studio**, <https://studio.azureml.net/>

**Microsoft Learn**, <https://docs.microsoft.com/en-us/learn/>

**Microsoft Learn**, Course AI-102T00: Designing and Implementing a Microsoft Azure AI Solution,

<https://docs.microsoft.com/en-us/learn/certifications/courses/ai-102t00>

**Microsoft Learn**, AI-102, <https://docs.microsoft.com/en-us/learn/certifications/azure-ai-engineer/>

**Microsoft Learn, Code Samples**, <https://docs.microsoft.com/en-us/samples/browse/>

Microsoft Official **Git Hub**, **AI-Basic examples for all APIs**, <https://github.com/MicrosoftDocs/ai-fundamentals>

Microsoft Official **Git Hub**, **Microsoft learn AI-900**, <https://github.com/MicrosoftLearning/mslearn-ai900>

Microsoft Official **Git Hub**, **Microsoft learn AI-102**, <https://github.com/MicrosoftLearning/AI-102-AIEngineer>

# Thank you! ;-)

Please e-mail me the screenshots of your final steps for each component / service to validate your bonus points.

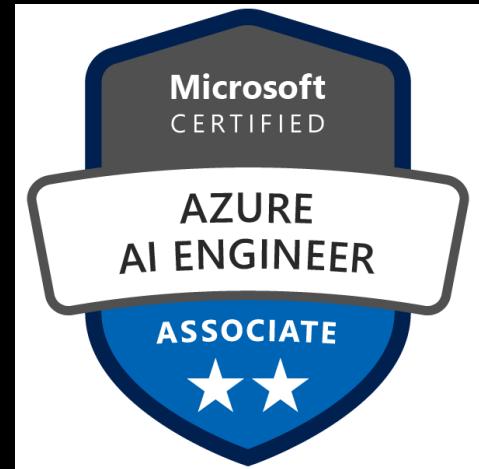
# Challenge #4 // Part 4

## Azure Cognitive Services

### Bot Composer

#### IN THIS CHALLENGE:

17. Bot Composer Prep
18. Creating your First Bot
19. QnA Maker API
20. QnA Maker.ai
21. QnA Bot – The Code
22. OCR (javascript)
23. Text Analytics
24. Speech



This content is based on the main requirements for AI-102 Certification



# Exam AI-102: Designing and Implementing a Microsoft Azure AI Solution

Candidates for Exam AI-102 should have subject matter expertise building, managing, and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework.

Candidates for this exam should be proficient in C#, Python, or JavaScript and should be able to use REST-based APIs and SDKs to build computer vision, natural language processing, knowledge mining, and conversational AI solutions on Azure. They should also understand the components that make up the Azure AI portfolio and the available data storage options. Plus, candidates need to understand and be able to apply responsible AI principles.



He can configure firewalls



See nobody cares,  
we use cloud now

# Before we start there are some important clarifications points:



- (1) Troubleshooting is REALLY important** – It is important for you to find the bugs in your code, env, IDE, etc.
- (2) The code IS JUST a code** – There are several ways to write a code and different languages. The examples here are just one way to do it.
- (3) This IS NOT a prep course** – The main goal here is to show the practical application of the Azure Resources with a focus on Enterprise AI solutions.
- (4) You won't be graded by the challenges** but, they are an important practical component in your learning experience.

**Challenge #4.17**

**Bot Composer Prep**

# Bot

There are 3 different ways to prep your bot:

1 - Bot Framework Composer

2 - <https://www.qnamaker.ai/>

3 - Code

Install Bot Framework Composer x +

docs.microsoft.com/en-us/composer/install-composer

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> Develop

> Test

> Debug

> Provision

> Publish

> Glossary

> Resources

> Reference

# Install Bot Framework Composer

05/19/2021 • 2 minutes to read • 5 contributors

**APPLIES TO:** Composer v1.x and v2.x

Get started with Bot Framework Composer by installing the desktop application for your operating system. For more advanced scenarios where you wish to customize the Composer application you can [build Composer from source](#).

[Download for Windows](#)

[Download for Mac OSX](#)

[Download for Linux](#)

**Note**

See [Supported OS versions](#) for a list of the supported OS versions.

## Installation prerequisites

Node.js is a key pre-requisite for Composer, which you need to ensure is installed on your machine, for .NET based bots you'll also need the .NET Core SDK 3.1 or later. When you create a new project, Composer will warn you if these aren't installed.

- [Node.js](#). Use the latest LTS 14.x or 12.x release.
- [.NET Core SDK 3.1](#) or later.

## Install Composer

[Download PDF](#)

<https://docs.microsoft.com/en-us/composer/install-composer>

Is this page helpful?

Yes No

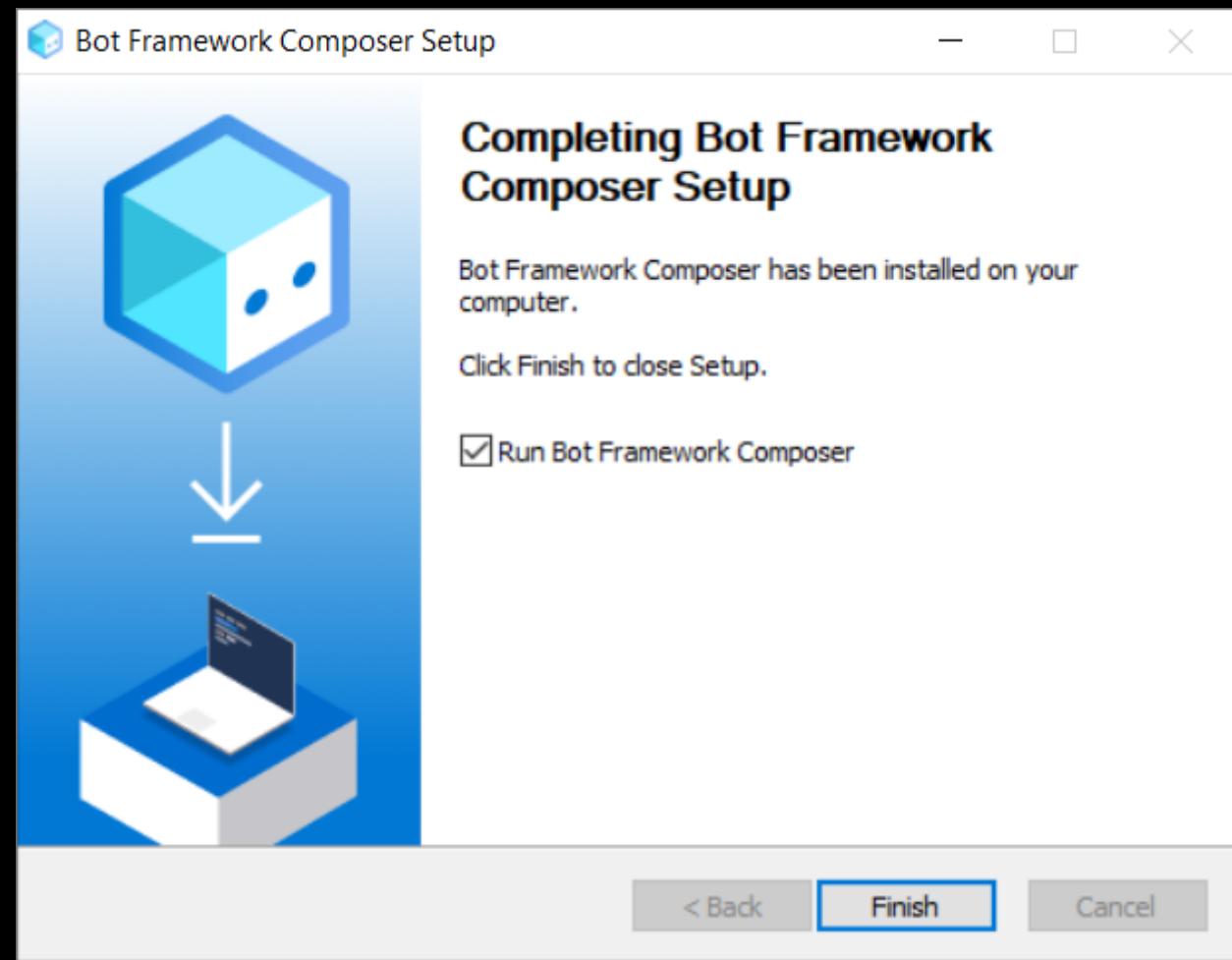
In this article

Installation prerequisites

Install Composer

Build Composer from source

Next steps



Installation Completed!





Collapse Navigation

Home

Create

Configure

User input

Bot responses

Knowledge base

Publish

Package manager

# Welcome to Bot Framework Composer

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Open the product tour to learn about Bot Framework Composer or [create a new bot](#)

## Resources



### Documentation

Everything you need to build sophisticated conversational experiences

[Learn more](#)

### GitHub

View documentation, samples, and extensions

[Open GitHub](#)

### Bot Framework Emulator

Test and debug your bots in Bot Framework Emulator

[Download Emulator](#)

### Stack Overflow

Connect with the community to ask and answer questions about Composer

[Go to Stack Overflow](#)

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Home

Create

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User input

Bot responses

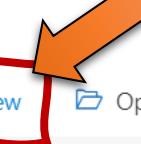
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- Knowledge base
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- Package manager

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Everything you need to know about the Bot Framework

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### Select a template

Microsoft's templates offer best practices for developing conversational bots.

C# Node (Preview)



Empty Bot



Core Bot with Language



Core Bot with QnA Maker



Core Assistant Bot



Enterprise Assistant Bot



Enterprise Calendar Bot



Enterprise People Bot



Empty Bot  
1.0.0

### Node.js required

Bot Framework Composer requires Node.js in order to create and run a new bot. Click "Install Node.js" to install the latest version. You will need to restart Composer after installing Node.

Install Node.js

Cancel



### Required Azure resources

- This template does not rely on any additional Azure resources

### Supported languages

Cancel

Next

Download | Nodejs

nodejs.org/en/download/

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G

## Downloads

Latest LTS Version: 14.17.1 (includes npm 6.14.13)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

LTS

Recommended For Most Users



Windows Installer

node-v14.17.1-x64.msi

Current

Latest Features



macOS Installer

node-v14.17.1.pkg



Source Code

node-v14.17.1.tar.gz

Windows Installer (.msi)

32-bit

64-bit

Windows Binary (.zip)

32-bit

64-bit

macOS Installer (.pkg)

64-bit

macOS Binary (.tar.gz)

64-bit

Select INSTALL NODE.JS

node-v14.17.1-x64.msi  
29.2/29.2 MB

Show all

Challenge #4.18

Creating your First Bot

# Bot Framework Composer

Bot Framework Composer, built on the Bot Framework SDK, is an **open-source IDE** for developers to **author, test, provision and manage** conversational experiences. It provides a powerful visual authoring canvas enabling dialogs, language-understanding models, QnAMaker knowledgebases and language generation responses to be authored from within one canvas and crucially, enables these experiences to be extended with code for more complex tasks such as system integration. Resulting experiences can then be tested within Composer and provisioned into Azure along with any dependent resources.



# Welcome to Bot

## Recent

+ Create new    Open

Name

CoreWithQnA

## Resources



Documentation

Everything you need to build sophisticated conversational exp...

[Learn more](#)

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## Tutorials

Microsoft Build  
May 25–27, 2021  
Digital event

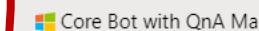
AI | The Show

All Around Azure  
A Developer's Guide to AI

## Select a template

Microsoft's templates offer best practices for developing conversational bots.

C#    Node (Preview)



**Core Bot with QnA Maker**

1.0.0

A simple question-and-answer bot with Azure QnA Maker.

### Recommended use

- Create a simple question-and-answer bot with Azure QnA Maker
- Customize and extend question-and-answer pairs or connect to your website's FAQ
- Extend your bot with [Azure Bot Framework components](#)

### Included capabilities

- Answer questions from a QnA Maker knowledge base

### Required Azure resources

- [Azure Language Understanding \(LUIS\)](#), or another recognizer of your choice

Cancel

Next

Need another template? Send us a request

## What's new

Conversational AI announcements at Microsoft Build 2021

Find out more about our latest release, including Composer 2.0, new...

Announcing Enterprise Assistant Bot Template and Conversational UX Guide

Find out more about the new Enterprise Assistant Bot template, to help yo...

Bot Framework Composer 1.3

New preview features: Form Dialogs, Orchestrator and Packag...

Build 2020 updates Read all of the updates from the Build conference, including Composer GA...

Microsoft Ignite 2020: Publish to Microsoft Power Virtual Agents Open a Power Virtual Agents topic in Bot



# Welcome to Bot Framework Composer

## Recent

+ Create new    Open

Name

CoreWithQnA

## Resources



Documentation

Everything you need to build sophisticated conversational experiences.

[Learn more](#)

## Latest Videos

## Tutorials

Microsoft Build  
May 25–27, 2021  
Digital event

## Create a bot project

Specify a name, description, and location for your new bot project.

Name \*

myFirstBot

Runtime type

Azure Web App

Location

C:\Users\caio...

[Create new folder](#)

↓ Name

Date modified



..

a few seconds ago



3D Objects

4 months ago

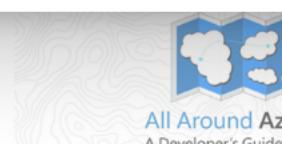


AppData

4 months ago

Cancel

Next



Microsoft Ignite

Add your Bot information / NEXT

## What's new

Conversational AI announcements at Microsoft Build 2021

Find out more about our latest release, including Composer 2.0, new...

Announcing Enterprise Assistant Bot Template and Conversational UX Guide

Find out more about the new Enterprise Assistant Bot template, to help yo...

Bot Framework Composer 1.3

New preview features: Form Dialogs, Orchestrator and Packag...

Build 2020 updates

Read all of the updates from the Build conference, including Composer GA...

Microsoft Ignite 2020: Publish to Microsoft Power Virtual Agents

Open a Power Virtual Agents topic in Bot



- + Add
- myFirstBot
- myFirstBot
  - Greeting
  - Unknown intent



Edit



Disable

Show code

myFirstBot

Get started

Learn more

## Recommended

Review your template readme  
Find additional template-specific guidance for setting up your bot. [Learn more](#)

Create a publishing profile  
A publishing profile provides the secure connectivity required to publish your bot. [Learn more](#)

Edit bot responses  
Define your bot's responses, add phrase variations, execute simple expressions based on context, or refer to conversational memory. [Learn more](#)

Edit user input and triggers  
Define user input and trigger phrases to direct the conversation flow. [Learn more](#)

Add packages  
Extend your bot with reusable dialogs, bot response templates and custom actions. [Learn more](#)

Enable App Insights  
Collect information about the use and performance of your bot. [Learn more](#)

## Add QnA Maker knowledge base

Use Azure QnA Maker to extract question-and-answer pairs from an online FAQ. [Learn more](#)

Knowledge base name \*

Windows\_FAQ

FAQ website (source)

English (United States) \*

<https://www.microsoft.com/en-ca/software-download/faq> Enable multi-turn extraction[Create custom knowledge base](#)

Cancel

Create

Frequently Asked Questions

microsoft.com/en-ca/software-download/faq

Microsoft | Software Download Windows Windows Insider Preview FAQ All Microsoft Search Sign in

# Frequently Asked Questions

(-) Windows

(-) What's the difference between 32-bit and 64-bit versions of Windows?

The terms 32-bit and 64-bit refer to the way a computer's processor (also called a CPU) handles information. The 64-bit version of Windows handles large amounts of random access memory (RAM) more effectively than a 32-bit system. Not all devices can run the 64-bit versions of Windows.

---

(+) How do I tell if my computer can run a 64-bit version of Windows?

---

(+) How do I find my Windows product key?

---

(+) I purchased my copy of Windows through a university. Can I download it here?

---

(+) My Windows 7 product key won't verify. What's the problem?

---

(+) I don't see the Windows 8.1 or Windows 10 edition I'm looking for. Where else should I check?

---

(+) I've created media using the media creation tool, now what do I do?

---

(+) I've downloaded an ISO file, now what?

<https://www.microsoft.com/en-ca/software-download/faq>



▶ Start bot



+ Add ▾

myFirstBot

- myFirstBot
- myFirstBot
- Greeting
- Unknown intent
- QnA Intent recognized

Edit ▾

Disable ▾

myFirstBot &gt; QnA Intent recognized

**⚡ QnA Intent recognized**

QnA Intent recognized

Branch: If/else

count(turn.recognized.answers[0].context.prompts) &gt; 0

True

Set a property

dialog.qnaContext :  
=turn.recognized.answers[0].context.prompts

[Activity]

⌚ x1 = \${expandText(@answer)}  
SuggestedActions =

Creating knowledge base...

Extracting question-and-answer pairs from https://www.microsoft.com/en-ca/software-download/faq

**Recommended**

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Define your bot's responses, add phrase variations, execute simple expressions based on context, or refer to conversational memory. [Learn more](#)

Edit user input and triggers  
Define user input and trigger phrases to direct the conversation flow. [Learn more](#)

**Optional**

Add packages  
Extend your bot with reusable dialogs, bot response templates and custom actions. [Learn more](#)

Enable App Insights  
Collect information about the use and performance of your bot. [Learn more](#)



Add



Edit



- myFirstBot x
- myFirstBot ...
- Greeting ...
- Unknown intent ...
- QnA Intent recognized** ...

myFirstBot &gt; QnA Intent recognized

Show code

**⚡ QnA Intent recognized**

QnA Intent recognized

Branch: If/else

count(turn.recognized.answers[0].context.prompts) &gt; 0

True

Set a property

dialog.qnaContext :  
=turn.recognized.answers[0].context.prompts

False

Send a response

- \${expandText(@answer)}



Prompt for text

[Activity]

x = \${expandText(@answer)}  
SuggestedActions =**Get started**

Learn more

**Required****!** Set up QnA Maker

Use Azure QnA Maker to create a simple question-and-answer bot from a website FAQ. [Learn more](#)

**Recommended****✓** Review your template readme

Find additional template-specific guidance for setting up your bot. [Learn more](#)

**✓** Create a publishing profile

A publishing profile provides the secure connectivity required to publish your bot. [Learn more](#)

**✓** Edit bot responses

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**✓** Edit user input and triggers

Define user input and trigger phrases to direct the conversation flow. [Learn more](#)

**Optional****✓** Add packages

Extend your bot with reusable dialogs, hot



myFirstBot

Start bot



Delete bot

## Configure your bot

myFirstBot (root)

Select region

Set up Language U

## Azure QnA Maker

QnA Maker is an Azure website FAQ. [Learn more](#)

QnA Maker Subscription key

Type subscription key

(X) QnA Maker Subscript

Set up QnA

## Microsoft App ID

An App ID is used for connecting your bot to other applications. Use an existing Microsoft App ID or create a new publishing profile for this bot.

Microsoft App Id [?](#)

Type App Id

Microsoft App Password [?](#)

Type App Password

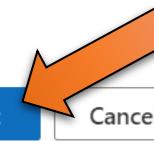
## Set up QnA Maker

Use Azure QnA Maker to create a simple question-and-answer bot from a website FAQ. [Learn more](#)

- Use existing resources
- Create and configure new Azure resources
- Generate instructions for Azure administrator

Next

Cancel



## Get started

## Required

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Define user input and trigger phrases to direct the conversation flow. [Learn more](#)

## Optional

## ✓ Add packages

Extend your bot with reusable dialogs, hot

Challenge #4.19

QnA Maker API

QnA Maker - Microsoft Azure x + ▼ - □ x

portal.azure.com/#blade/Microsoft\_Azure\_Marketplace/GalleryItemDetailsBladeNopdl/product/%7B"displayName"%3A"QnA%20Maker"%2C"itemDisplayName"%3A"QnA%20Maker"%2C"id"... ☆

Microsoft Azure Search resources, services, and docs (G+/) ≡ ? ? ? ? ? ?

Home > Create a resource >

**QnA Maker** Microsoft ... x

 **QnA Maker** Add to Favorites Microsoft 4.2 (171 ratings) Create

Overview Plans Usage Information + Support Reviews

QnA Maker is a cloud-based API service that lets you create a conversational question-and-answer layer over your existing data. Use it to build a knowledge base by extracting questions and answers from your semi-structured content, including FAQs, manuals, and documents. Answer users' questions with the best answers from the QnAs in your knowledge base -- automatically. Your knowledge base gets smarter, too, as it continually learns from user behavior.

More offers from Microsoft See All

|                                                                                                                                                                              |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>Workspace<br><br>Microsoft<br><br>Virtual Machine<br><br>Azure Virtual Desktop resource | <br>Microsoft HPC Pack 2012 R2<br><br>Microsoft<br><br>Virtual Machine<br><br>Enterprise-class HPC solution. Easy to deploy, cost-effective and supports Windows/Linux workloads. | <br>Windows 10 IoT Core Services<br><br>Microsoft<br><br>Azure Service<br><br>Commercialize your project with enterprise-grade security and support | <br>Web App + SQL<br><br>Microsoft<br><br>Azure Service<br><br>Enjoy secure and flexible development, deployment, and scaling options for your web app |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

<https://portal.azure.com/#>

Select CREATE A NEW RESOURCE and select QnA MAKER / CREATE

Create - Microsoft Azure

portal.azure.com/#create/Microsoft.CognitiveServicesQnAMaker

Microsoft Azure Upgrade Search resources, services, and docs (G+)

Home > Create a resource > QnA Maker >

# Create

## QnA Maker

**\* Basics** Tags Review + create

QnA Maker is a cloud-based API service that lets you create a conversational question-and-answer layer over your existing data. Use it to build a knowledge base by extracting questions and answers from your semi-structured content, including FAQs, manuals, and documents. Answer users' questions with the best answers from the QnAs in your knowledge base automatically. Your knowledge base gets smarter, too, as it continually learns from user behavior. [Learn more](#)

**i** QnA Maker managed (preview) is now a feature within Text Analytics, and it has been renamed to custom question answering. [Create a Text Analytics resource](#) to use question answering and other features such as entity recognition, sentiment analysis, etc.

### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

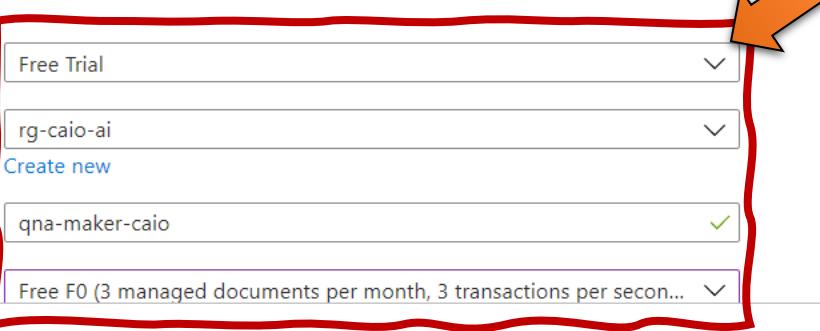
Subscription \* ⓘ Free Trial

Resource group \* ⓘ rg-caio-ai

Name \* ⓘ qna-maker-caio

Pricing tier (Learn More) \* ⓘ Free F0 (3 managed documents per month, 3 transactions per second)

Review + create Next : Tags >



Create - Microsoft Azure

portal.azure.com/#create/Microsoft.CognitiveServicesQnAMaker

Microsoft Azure Upgrade Search resources, services, and docs (G+/)

Home > Create a resource > QnA Maker >

## Create

QnA Maker

Azure Search location \* (US) East US

Azure Search pricing tier \* Free F (3 Indexes)

App Service details - for runtime

When you create a QnAMaker resource, you host the runtime in your own Azure subscription. App Service is the compute engine that runs the QnA Maker queries for you.

App name \* qna-maker-caio

Website location \* (US) East US

**Info** The App service plan currently defaults to standard(S1) tier ([Pricing](#)). It can be modified by visiting the app service plan resource page once the resource has been created.

App insights details - for telemetry and chat logs

QnAMaker will optionally provision an instance of Application Insights and will appear in your Azure subscription. Telemetry and chatlogs will be stored here.

App insights [Enable](#) [Disable](#)

App insights location \* (US) East US

[Review + create](#) [Next : Tags >](#)

https://portal.azure.com/#home

## Create

QnA Maker

### Project details

|                |                |
|----------------|----------------|
| Subscription   | Free Trial     |
| Resource group | rg-caio-ai     |
| Name           | qna-maker-caio |
| Pricing tier   | F0             |

### Azure Search details - for data

|                           |         |
|---------------------------|---------|
| Azure Search location     | East US |
| Azure Search pricing tier | F       |

### App Service details - for runtime

|                  |                |
|------------------|----------------|
| App name         | qna-maker-caio |
| Website location | East US        |

### App insights details - for telemetry and chat logs

|                       |         |
|-----------------------|---------|
| App insights          | Enabled |
| App insights location | East US |

Validating... < Previous : Tags

Download a template for automation

Select CREATE



## Azure services

Create a  
resourceCost  
Management ...

All resources

Azure Active  
Directory

App Services



Policy



Subscriptions



Data factories



SQL databases



More services

## Recent resources

| Name                                    | Type               | Last Viewed       |
|-----------------------------------------|--------------------|-------------------|
| qna-maker-caio                          | Cognitive Services | a few seconds ago |
| rg-caio-ai                              | Resource group     | a few seconds ago |
| machinelearning-ai1006                  | Machine learning   | 17 hours ago      |
| machinelearning-caio                    | Machine learning   | 17 hours ago      |
| Free Trial                              | Subscription       | 17 hours ago      |
| computer-vision-caio                    | Cognitive Services | 21 hours ago      |
| cognitiveservices-caio                  | Cognitive Services | 21 hours ago      |
| storageaccountcaio                      | Storage account    | 21 hours ago      |
| face-api-ai1006                         | Cognitive Services | 2 days ago        |
| language-understanding-ai1006-Authoring | Cognitive Services | 2 days ago        |
| speech-ai1006                           | Cognitive Services | 2 days ago        |
| translator-caio                         | Cognitive Services | 6 days ago        |





myFirstBot

Start bot



Delete bot

## Configure your bot

myFirstBot (root)

Select region

Set up Language U

## Azure QnA Maker

QnA Maker is an Azure website FAQ. [Learn more](#)

QnA Maker Subscription key

Type subscription key

(X) QnA Maker Subscript

Set up QnA

## Microsoft App ID

An App ID is used for connecting your bot to other applications. Use an existing Microsoft App ID or create a new publishing profile for this bot.

Microsoft App Id [?](#)

Type App Id

Microsoft App Password [?](#)

Type App Password

## Set up QnA Maker

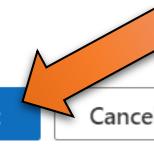


Use Azure QnA Maker to create a simple question-and-answer bot from a website FAQ. [Learn more](#)

 Use existing resources Create and configure new Azure resources Generate instructions for Azure administrator

Next

Cancel



## Get started

Learn more

## Required

## ! Set up QnA Maker

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## ✓ Edit user input and triggers

Define user input and trigger phrases to direct the conversation flow. [Learn more](#)

## Optional

## ✓ Add packages

Extend your bot with reusable dialogs, hot

Problems Web Chat Output



myFirstBot

Delete bot

## Configure your bot

myFirstBot (root)

Select region

Set up Language U

Azure QnA Maker

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QnA Maker Subscription key

Type subscription key

(X) QnA Maker Subscription key

Set up QnA

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Microsoft App Id [?](#)

Type App Id

Microsoft App Password [?](#)

Type App Password

Select QnA Maker resources

Select your Azure directory, then choose the subscription where your existing QnA Maker resource is located. [Learn more](#)

Azure directory \*

Default Directory

Azure subscription \*

Free Trial

QnA Maker resource name

qna-maker-caio

Back

Next

Cancel

## Get started

### Required

! Set up QnA Maker

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Delete bot

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myFirstBot (root)

Select region

Set up Language U

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QnA Maker Subscription key

ea1f677965ef4f1d97fc

Set up QnA

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Microsoft App Id [?](#)

Type App Id

Microsoft App Password [?](#)

Type App Password

Retrieve App ID

## Select QnA Maker resources

X

The following QnA Maker keys have been successfully added to your bot project:

Key

Region  
westus

Done



## Get started

Learn more

## Required

 Set up QnA Maker

Use Azure QnA Maker to create a simple question-and-answer bot from a website FAQ. [Learn more](#)

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Define user input and trigger phrases to direct the conversation flow. [Learn more](#)

## Optional

 Add packages

Extend your bot with reusable dialogs, hot



Delete bot

## Configure your bot

 Advanced Settings View (json)

myFirstBot (root)

Overview Development resources Connections Skill configuration Localization

## Azure Language Understanding

Language Understanding (LUIS) is an Azure Cognitive Service that uses machine learning to understand natural language input and direct the conversation flow. [Learn more](#). Use an existing Language Understanding (LUIS) key from Azure or create a new key. [Learn more](#)

Application name ?

myFirstBot

Language Understanding authoring key ?

Type Language Understanding authoring key

Language Understanding region ?

Select region

**Set up Language Understanding**

## Azure QnA Maker

QnA Maker is an Azure Cognitive services that can extract question-and-answer pairs from a website FAQ. [Learn more](#). Use an existing key from Azure or create a new key. [Learn more](#).

QnA Maker Subscription key \* ?

ea1f677965ef4f1d97f017f6e611b7b5

# Starting your Bot



Delete bot

## Configure your bot

myFirstBot (root)

Overview

Development resources

Connections

Skill configuration

Localization

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Application name

myFirstBot

Language Understanding authoring key

Type Language Understanding authoring key

Language Understanding region

Select region

**Set up Language Understanding**

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QnA Maker Subscription key \*

ea1f677965ef4f1d97f017f6e611b7b5



Delete bot

## Configure your bot

myFirstBot (root)

Overview

Development resources

Connections

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Application name

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Language Understanding authoring key

Type Language Understanding authoring key

Language Understanding region

Select region

**Set up Language Understanding**

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QnA Maker Subscription key \*

ea1f677965ef4f1d97f017f6e611b7b5

## Local bot runtime manager

Start and stop local bot runtimes individually.

| Bot        | Status  |                                 |
|------------|---------|---------------------------------|
| myFirstBot | Running | Open Web Chat  Test in Emulator |

Restart bot



Delete bot



## Configure your bot

myFirstBot (root)

Overview Development resources Connections Skill configuration Localization

## Azure Language Understanding

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Application name

myFirstBot

Language Understanding authoring key

Type Language Understanding authoring key

Language Understanding region

Select region

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QnA Maker is an Azure Cognitive services that can extract question-and-answer pairs from a website FAQ. [Learn more](#). Use an existing key from Azure or create a new key. [Learn more](#).

QnA Maker Subscription key \*

ea1f677965ef4f1d97f017f6e611b7b5

myFirstBot

Restart Conversation - new user ID

what is the difference between windows?

Just now

The terms 32-bit and 64-bit refer to the way a computer's processor (also called a CPU) handles information. The 64-bit version of Windows handles large amounts of random access memory (RAM) more effectively than a 32-bit system. Not all devices can run the 64-bit versions of Windows.

windows product key?

Just now

Windows 8.1 and Windows 10

The product key is located inside the product packaging, on the receipt or confirmation page for a digital purchase, or in a confirmation email that shows you purchased Windows. If you purchased a digital copy from [Microsoft Store](#)

, you can locate your product key in your [Account under Digital Content](#)

Type your message

# Knowledge Base



Home

Create

Configure

User input

Bot responses

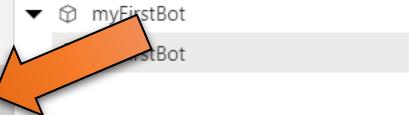
Knowledge base

Publish

Package manager

## Knowledge (QnA)

Show code

▼  
myFirstBot  
...  
myFirstBot

## Question

## Answer

Windows\_FAQ ...

Add new question

What's the difference between 32-bit and 64-bit versions of Windows? (1)

The terms 32-bit and 64-bit refer to the way a computer's processor (also called a CPU) handles information. The 64-bit version of Windows handles large amounts of random access memory (RAM) more

How do I tell if my computer can run a 64-bit version of Windows? (1)

If you have a Windows operating system installed, open File Explorer or This PC.  
Right-click on This PC or Computer in the navigation pane and select

How do I find my Windows product key? (1)

Windows 8.1 and Windows 10

The product key is located inside the product packaging, on the receipt

I purchased my copy of Windows through a university. Can I download it here? (...)

Yes, but you'll need your product key. Go to the [Academic Products](https://www.microsoft.com/en-ca/software-download/vlacademic)

My Windows 7 product key won't verify. What's the problem? (1)

The most common issue is the use of a product key for a product that is not currently supported by the site such as an Upgrade key, an MSDN key, product keys for pre-installed media or an Enterprise edition key.



- Home
- Create
- Configure
- User input
- Bot responses
- Knowledge base
- Publish
- Package manager

## Knowledge (QnA)

Show code



▼  
myFirstBot  
...  
myFirstBot

### Question

### Answer

**Windows\_FAQ** ...

Add new question

Add new answer

What's the difference between 32-bit and 64-bit versions of Windows? (1)

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Challenge #4.20

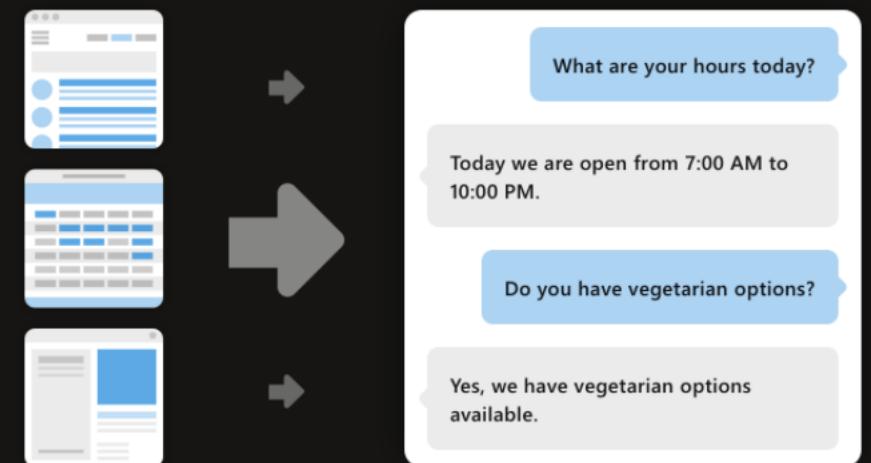
<https://www.qnamaker.ai/>

Try Custom question answering feature (Preview) in Text Analytics with added support for unstructured files. [Learn more.](#)

# From data to bot in minutes

Build, train and publish a sophisticated bot using FAQ pages, support websites, product manuals, SharePoint documents or editorial content through an easy-to-use UI or via REST APIs.

[Get started >](#)



ⓘ Help us improve QnA Maker

[Take our survey!](#)

X

## My knowledge bases

caiogasparinegmail (Default Direct)

All subscriptions

All services

| Knowledge base name                                                                                              | Last modified         | Last published        | Sample Code               | Azure service name |                                                                                     |
|------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|---------------------------|--------------------|-------------------------------------------------------------------------------------|
|  myFirstBot(composer).en-us.qna | 6/17/2021, 5:19:58 PM | 6/17/2021, 5:20:05 PM | <a href="#">View Code</a> | qna-maker-caio     |  |



## myFirstBot(composer).en-us.qna (Publ...)

EDIT

PUBLISH

SETTINGS

Save and train

← Test



## Knowledge base

Search the KB



28 QnA pairs



Add QnA pair



View options

Enable rich editor



2

3

Next &gt;

## Question

## Answer

Source: <https://www.microsoft.com/en-ca/software-download/faq>

What's the difference between 32-bit and 64-bit versions of Windows?

+ Add alternative phrasing

The terms 32-bit and 64-bit refer to the way a computer's processor (also called a CPU) handles information. The 64-bit version of Windows handles large amounts of random access memory (RAM) more effectively than a 32-bit system. Not all devices can run the 64-bit versions of Windows.



+ Add follow-up prompt

How do I tell if my computer can run a 64-bit version of Windows?

+ Add alternative phrasing

If you have a Windows operating system installed, open File Explorer or This PC. Right-click on This PC or Computer in the navigation pane and



## myFirstBot(composer).en-us.qna (Publ...)

EDIT

PUBLISH

SETTINGS

Save and train

← Test

## myFirstBot(composer).en-us.qna

Publishing your knowledge base moves your QnAs from the test index to the production index. Once you publish, the knowledge base endpoint becomes available for use in your Bot or App.

This knowledge base will be published to the [qna-maker-caio](#) QnA Maker service.

Cancel

Publish



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

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

Create Bot



[View](#) all your bots on the Azure Portal.

Use the below HTTP request to call your Knowledgebase. [Learn more.](#)

Postman    Curl

```
POST /knowledgebases/d9f9f3b0-44c6-4c72-81d4-d9a8266f4466/generateAnswer
Host: https://qna-maker-caio.azurewebsites.net/qnamaker
Authorization: EndpointKey d05e9901-6f63-4eef-b100-c1f15f9905b4
Content-Type: application/json
{"question":"<Your question>"}
```

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

Edit Service

portal.azure.com/?Microsoft\_Azure\_BotService\_subscriptionId=bf350b48-f641-49a2-b7e4-598ce72df8ab&Microsoft\_Azure\_BotService\_qnaHostName=qna-maker-caio.azurewebsites.net... ☆ 🔍

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) 1 ? ? ? ? caigasparine@gmail.c... DEFAULT DIRECTORY

Home > Web App Bot ...

Bot Service

Pricing tier [View full pricing details](#)

F0 (10K Premium Messages)

App name \*  .azwebsites.net

SDK language \*

C#  Node.js

QnA Auth Key \*

\*App service plan/Location [>](#)  
qna-maker-caio/East US

Application Insights [i](#)

On  Off

Application Insights Location \* [i](#)

East US

Microsoft App ID and password [i](#)

Auto create App ID and password

Create Automation options

https://www.qnamaker.ai/

Microsoft Azure    [Upgrade](#)   

All services >

## All resources

Default Directory

[Create](#) [Manage view](#) [Refresh](#) [Export to CSV](#) [Open query](#) [Feedback](#) | [Assign tags](#) [Delete](#)

Filter for any field...    Subscription == all    Resource group == all    Type == all    Location == all    [Add filter](#)

Showing 1 to 30 of 30 records.  Show hidden types

| Name                                    | Type                 | Resource group | Location     | Subscription |
|-----------------------------------------|----------------------|----------------|--------------|--------------|
| bot-handle6                             | Web App Bot          | rg-caio-ai     | Global       | Free Trial   |
| bot-handle6                             | App Service          | rg-caio-ai     | East US      | Free Trial   |
| bot-handle6vna533                       | Application Insights | rg-caio-ai     | East US      | Free Trial   |
| cognitiveservices-caio                  | Cognitive Services   | rg-caio-ai     | Brazil South | Free Trial   |
| computer-vision-caio                    | Cognitive Services   | rg-caio-ai     | East US      | Free Trial   |
| df-caio-001                             | Data factory (V2)    | rg-caio-ai     | Brazil South | Free Trial   |
| dlcaioai                                | Storage account      | rg-caio-ai     | Brazil South | Free Trial   |
| face-api-ai1006                         | Cognitive Services   | rg-caio-ai     | Brazil South | Free Trial   |
| language-understanding-ai1006           | Cognitive Services   | rg-caio-ai     | East US      | Free Trial   |
| language-understanding-ai1006-Authoring | Cognitive Services   | rg-caio-ai     | West US      | Free Trial   |
| machinelearnin0720013928                | Storage account      | rg-caio-ai     | Brazil South | Free Trial   |

< Previous Page 1 of 1 Next >

Microsoft Azure    [Upgrade](#)    [Search resources, services, and docs \(G+\)](#)

All services > All resources > bot-handle6

## All resources

Default Directory

+ Create a resource    Home    Dashboard    All services    FAVORITES    All resources    Resource groups    App Services    Function App    SQL databases    Azure Cosmos DB    Virtual machines    Load balancers    Storage accounts    Virtual networks    Azure Active Directory    Monitor    Advisor    Security Center    Cost Management + Bill...

[Create](#)    [Manage view](#)    ...

Filter for any field...

| Name                                 | Actions |
|--------------------------------------|---------|
| bot-handle6                          | ...     |
| bot-handle6                          | ...     |
| bot-handle6vna533                    | ...     |
| cognitiveservices-caio               | ...     |
| computer-vision-caio                 | ...     |
| df-caio-001                          | ...     |
| dlcaioai                             | ...     |
| face-api-ai1006                      | ...     |
| language-understanding-ai1006        | ...     |
| language-understanding-ai1006-Aut... | ...     |
| machinelearnin0720013928             | ...     |
| machinelearnin1030589640             | ...     |
| machinelearnin1111828162             | ...     |

< Page 1 > of 1

<https://dev.botframework.com/bots/channels?id=bot-handle6&channelId=webchat>

## bot-handle6 | Channels

Web App Bot

Search (Ctrl +/)

Overview    Activity log    Access control (IAM)    Tags

Settings    Bot profile    Configuration

Channels    Channels (Preview)

Pricing    Test in Web Chat    Encryption    Properties    Locks

Monitoring    Conversational analytics

## Connect to channels

| Name     | Health  | Published |
|----------|---------|-----------|
| Web Chat | Running | --        |

[Edit](#)    [Get bot embed codes](#)

Add a featured channel

More channels

Microsoft Azure    [Upgrade](#)    [Search resources, services, and docs \(G+/\)](#)

All services > All resources > bot-handle6

**All resources**    Default Directory

+ Create a resource    Home    Dashboard    All services    **FAVORITES**    All resources    Resource groups    App Services    Function App    SQL databases    Azure Cosmos DB    Virtual machines    Load balancers    Storage accounts    Virtual networks    Azure Active Directory    Monitor    Advisor    Security Center    Cost Management + Bill...

**bot-handle6 | Channels**    Web App Bot

**bot-handle6**

**bot-handle6**

bot-handle6vna533

cognitiveservices-caio

computer-vision-caio

df-caio-001

dlcaioai

face-api-ai1006

language-understanding-ai1006

language-understanding-ai1006-Aut...

machinelearnin0720013928

machinelearnin1030589640

machinelearnin1111828162

**bot-handle6 | Channels**

Search (Ctrl+ /)

Overview    Activity log    Access control (IAM)    Tags

Settings    Bot profile    Configuration

**Channels**

Channels (Preview)    Pricing    Test in Web Chat    Encryption    Properties    Locks

Monitoring    Conversational analytics

**Configure Web Chat**

**+ Add new site**    Default Site     Disable

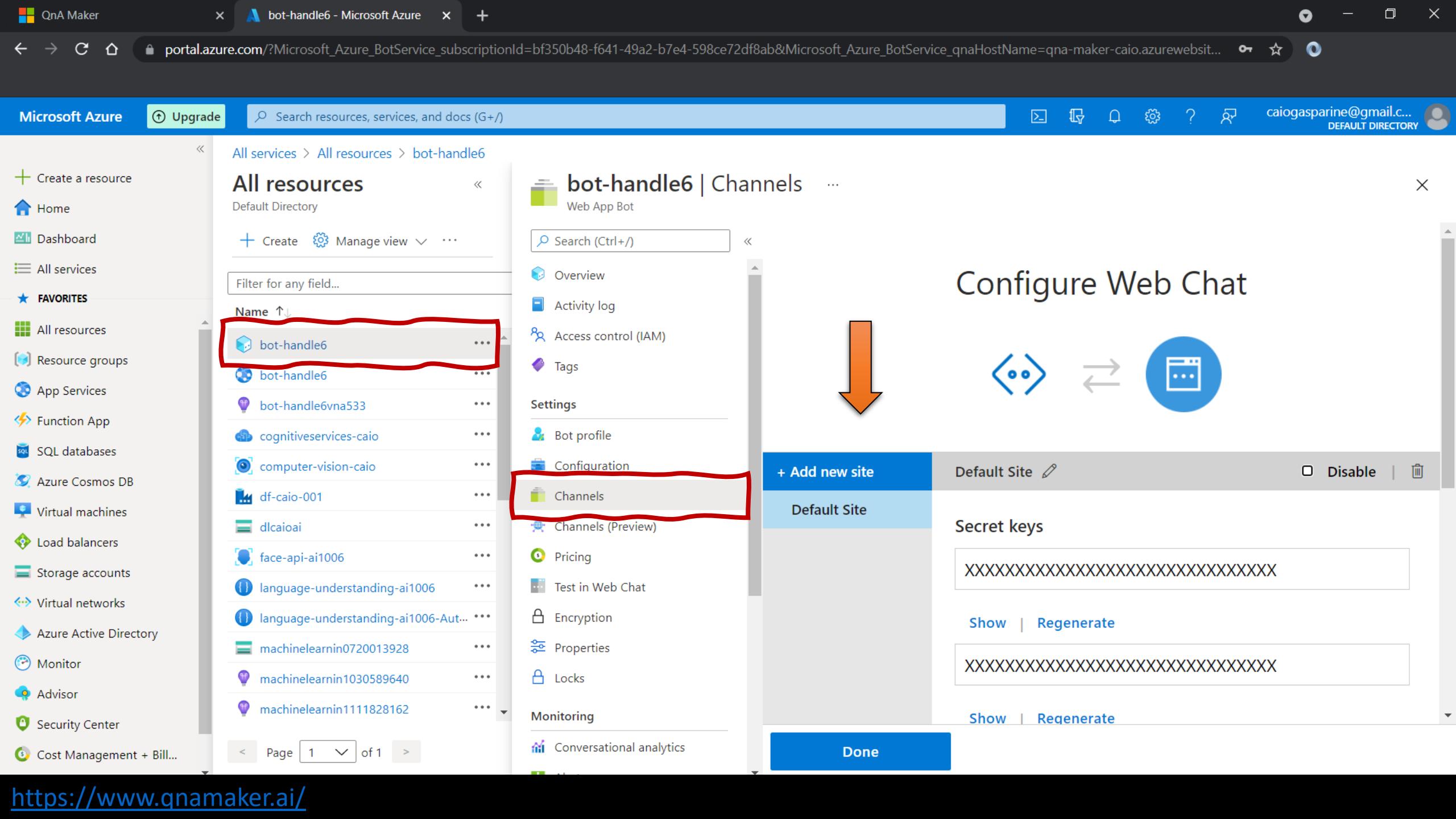
**Default Site**

**Secret keys**

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
[Show](#) | [Regenerate](#)

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
[Show](#) | [Regenerate](#)

**Done**



Copy the Embed code // iframe

Microsoft Azure    [Upgrade](#)    [Search resources, services, and docs \(G+\)](#)

All services > All resources > bot-handle6

All resources

Default Directory

+ Create a resource    Home    Dashboard    All services    **FAVORITES**    All resources    Resource groups    App Services    Function App    SQL databases    Azure Cosmos DB    Virtual machines    Load balancers    Storage accounts    Virtual networks    Azure Active Directory    Monitor    Advisor    Security Center    Cost Management + Bill...

[Create](#)    [Manage view](#)    ...

Filter for any field...

| Name                                 | ... |
|--------------------------------------|-----|
| bot-handle6                          | ... |
| bot-handle6                          | ... |
| bot-handle6vna533                    | ... |
| cognitiveservices-caio               | ... |
| computer-vision-caio                 | ... |
| df-caio-001                          | ... |
| dlcaioai                             | ... |
| face-api-ai1006                      | ... |
| language-understanding-ai1006        | ... |
| language-understanding-ai1006-Aut... | ... |
| machinelearnin0720013928             | ... |
| machinelearnin1030589640             | ... |
| machinelearnin1111828162             | ... |

bot-handle6 | Channels

Web App Bot

Default Site

Search (Ctrl+ /)

Overview    Activity log    Access control (IAM)    Tags

Settings    Bot profile    Configuration

Channels

Channels (Preview)    Pricing    Test in Web Chat    Encryption    Properties    Locks

Monitoring    Conversational analytics

Secret keys

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Show | Regenerate

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Show | Regenerate

Embed code

```
<iframe src='https://webchat.botframework.com/embed/bot-handle6?s=YOUR_SECRET_HERE' style='min-width: 400px; width: 100%; min-height: 500px;'></iframe>
```

[Copy](#)    Learn more about advanced customization options for Web Chat

Done

language-understanding-ai1006 x Notebooks - Microsoft Azure Ma +

ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-46... ☆

Microsoft Azure Machine Learning

Home > Notebooks

Success: Successfully uploaded all files

Notebooks

Files Samples

01a - Image Analysis with Computer Vision.ipynb  
01b - Image Classification.ipynb  
01c - Object Detection.ipynb  
01d - Face Analysis.ipynb  
01e - Optical Character Recognition.ipynb  
01f - Receipts with Form Recognizer.ipynb  
02a - Text Analytics.ipynb  
02b - Speech.ipynb  
02c - Translation.ipynb  
02d - Language Understanding.ipynb  
03a - QnA Bot.ipynb  
CODE\_OF\_CONDUCT.md  
LICENSE  
README.md  
SECURITY.md

02d - Language Unc x \*03a - QnA Bot.ipynb x

ml-compute · Kernel not connected

7. Run the cell below by clicking the **Run cell** (>) button on the left of the cell to render the HTML.  
8. In the HTML chat interface, test the bot by submitting a question, such as *Who is Margie?* or *What destinations can I go to?* (when the bot initializes, it may respond with the message *Hello and welcome* in addition to answering your question.).

1 %%html  
2  
3 <iframe src='https://webchat.botframework.com/embed/bot-handle6?s=YOUR\_SECRET\_HERE' style='border:none; width:100%; height:100px;'></iframe>  
4

Experiment with the bot. You'll probably find that it can answer questions from the FAQ quite accurately, but it will have limited ability to interpret questions that it has not been trained with. You can always use the QnA Maker portal to edit the knowledge base to improve it, and republish it.

Learn More

- To learn more about the QnA Maker service, view [the QnA Maker documentation](#).
- To learn more about the Microsoft Bot Service, view [the Azure Bot Service page](#).

Paste your CODE here!

Microsoft Azure    [Upgrade](#)    [Search resources, services, and docs \(G+\)](#)

All services > All resources > bot-handle6

## All resources

Default Directory

+ Create    Manage view

Filter for any field...

Name	...
bot-handle6	...
bot-handle6	...
bot-handle6vna533	...
cognitiveservices-caio	...
computer-vision-caio	...
df-caio-001	...
dlcaioai	...
face-api-ai1006	...
language-understanding-ai1006	...
language-understanding-ai1006-Aut...	...
machinelearnin0720013928	...
machinelearnin1030589640	...
machinelearnin1111828162	...

bot-handle6 | Channels

Web App Bot

Search (Ctrl +/)

Overview

Activity log

Access control (IAM)

Tags

Settings

Bot profile

Configuration

Channels

Channels (Preview)

Pricing

Test in Web Chat

Encryption

Properties

Locks

Monitoring

Conversational analytics

+ Add new site

Default Site

Default Site

Secret keys

azMhFYhY4ag.TqWyNSLiHU4Yf5eymlqvsOuU0WjqSjbUUN

Hide | Regenerate

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Show | Regenerate

Embed code

```
<iframe src='https://webchat.botframework.com/embed/bot-handle6?s=YOUR_SECRET_HERE' style='min-width: 400px; width: 100%; min-height: 500px;'></iframe>
```

Done

Copy your Secret key

language-understanding-ai1006 x Notebooks - Microsoft Azure Ma +

ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-46... ☆

Microsoft Azure Machine Learning

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Notebooks

Files Samples

01a - Image Analysis with Computer Vision.ipynb  
01b - Image Classification.ipynb  
01c - Object Detection.ipynb  
01d - Face Analysis.ipynb  
01e - Optical Character Recognition.ipynb  
01f - Receipts with Form Recognizer.ipynb  
02a - Text Analytics.ipynb  
02b - Speech.ipynb  
02c - Translation.ipynb  
02d - Language Understanding.ipynb  
03a - QnA Bot.ipynb  
CODE\_OF\_CONDUCT.md  
LICENSE  
README.md  
SECURITY.md

02d - Language Unc x 03a - QnA Bot.ipynb x

ml-compute · Kernel not connected

7. Run the cell below by clicking the **Run cell** (▶) button on the left of the cell to render the HTML.  
8. In the HTML chat interface, test the bot by submitting a question, such as *Who is Margie?* or *What destinations can I go to?* (when the bot initializes, it may respond with the message *Hello and welcome* in addition to answering your question.).

Run cell

1  
2  
3 iework.com/embed/bot-handle6?s=azMhFYhY4ag.TqWyNSLiHU4Yf5eymIqvsOuU0WjqSjbUUNzfDsJZos' s  
4

Experiment with the bot. You'll probably find that it can answer questions from the FAQ quite accurately, but it will have limited ability to interpret questions that it has not been trained with. You can always use the QnA Maker portal to edit the knowledge base to improve it, and republish it.

Learn More

- To learn more about the QnA Maker service, view [the QnA Maker documentation](#).
- To learn more about the Microsoft Bot Service, view [the Azure Bot Service page](#).

Start the cell to RUN your code

language-understanding-ai1006 x Notebooks - Microsoft Azure Ma x +

ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-293... ? ☆ ○

Microsoft Azure Machine Learning

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Notebooks

Files Samples

02d - Language Unc x 03a - QnA Bot.ipynb x

ml-compute - Kernel idle

Python 3.6.9

.gitignore  
01a - Image Analysis with Computer Vision.ipynb  
01b - Image Classification.ipynb  
01c - Object Detection.ipynb  
01d - Face Analysis.ipynb  
01e - Optical Character Recognition.ipynb  
01f - Receipts with Form Recognizer.ipynb  
02a - Text Analytics.ipynb  
02b - Speech.ipynb  
02c - Translation.ipynb  
02d - Language Understanding.ipynb  
03a - QnA Bot.ipynb  
ML\_CODE\_OF\_CONDUCT.md  
LICENSE  
ML README.md  
ML SECURITY.md  
setup.cmd  
regression-automl-nyc-taxi-data  
.amlignore  
text-translator.ipynb

ml-compute - Running

Python 3.6 - AzureML

7

Free Trial machinelearning-ai1006 CG

ml-compute - Kernel idle

1  
2  
3 [rework.com/embed/bot-handle6?s=azMhFYhY4ag.TqWyNSLiHU4Yf5eymIqvsOuU0WjqSjbUUNzfDsJZos](http://rework.com/embed/bot-handle6?s=azMhFYhY4ag.TqWyNSLiHU4Yf5eymIqvsOuU0WjqSjbUUNzfDsJZos) style='min-width: 400px; width: 100%; min-height: 500px;  
4  
✓ <1 sec

Welcome to the QnA Maker sample! Ask me a question and I will try to answer it.

Hi! ;-} How are you doing?

The terms 32-bit and 64-bit refer to the way a computer's processor (also called a CPU) handles information. The 64-bit version of Windows handles large amounts of random access memory (RAM) more effectively than a 32-bit system. Not all devices can run the 64-bit versions of Windows.

Windows 64

Type your message

Your bot is RUNNING!

# Steps to create your Chat Bot

- 1 – Create Q&A – Azure Portal
- 2 – Go to qnamaker.ai
- 3 – Create QnA
- 4 – KB definition
- 5 – Upload doc
- 6 – Add URL
- 7 – Create KB
- 8 – Add questions // if required
- 9 – Save and Train
- 10 – Test
- 11 – Publish
- 12 – Create a bot App
- 13 – Azure Portal – Channels
- 14 – Copy iframe + Secret

**Challenge #4.21**

**QnA Bot – The Code**

language-understanding-ai1006 x Notebooks - Microsoft Azure Ma +

ml.azure.com/fileexplorerAzNB?wsid=/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourcegroups/rg-caio-ai/workspaces/machinelearning-ai1006&tid=362067a6-2936-46... ☆

Microsoft Azure Machine Learning

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Notebooks

Files Samples

01a - Image Analysis with Computer Vision.ipynb  
01b - Image Classification.ipynb  
01c - Object Detection.ipynb  
01d - Face Analysis.ipynb  
01e - Optical Character Recognition.ipynb  
01f - Receipts with Form Recognizer.ipynb  
02a - Text Analytics.ipynb  
02b - Speech.ipynb  
02c - Translation.ipynb  
02d - Language Understanding.ipynb  
CODE\_OF\_CONDUCT.md  
LICENSE  
README.md  
SECURITY.md

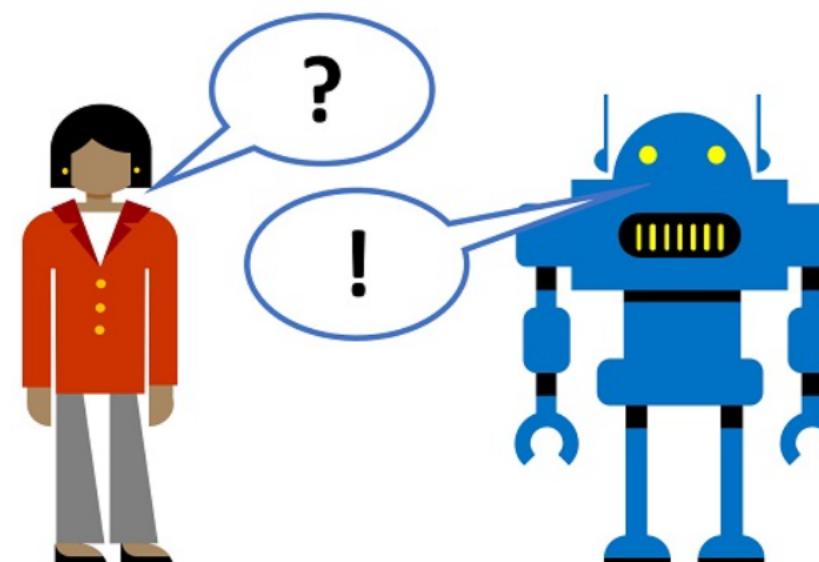
02d - Language Unc x 03a - QnA Bot.ipynb x

ml-compute · Kernel idle

Python 3.6.9

Conversational AI

Think about how often you communicate with other people through instant messaging, social media, email, or other online technologies. For many of us, it's our go-to form of contact. When you have a question at work, you might reach out to a colleague using a chat message, which you can use on mobile devices, so you're always in touch.



An orange arrow points from the '03a - QnA Bot.ipynb' file in the left sidebar towards the main workspace area.

**Challenge #4.22**

**OCR - javascript**

cognitive-services-quickstart-cod x +

github.com/Azure-Samples/cognitive-services-quickstart-code/blob/master/javascript/ComputerVision/REST/javascript-print-text.md

Raw Blame

```
<!DOCTYPE html>
<html>
<head>
 <title>OCR Sample</title>
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.9.0/jquery.min.js"></script>
</head>
<body>

<script type="text/javascript">
 function processImage() {
 // *****
 // *** Update or verify the following values. ***
 // *****

 var subscriptionKey = document.getElementById("subscriptionKey").value;
 var endpoint = document.getElementById("endpointUrl").value;

 var uriBase = endpoint + "vision/v3.1/ocr";

 // Request parameters.
 var params = {
 "language": "unk",
 "detectOrientation": "true",
 };

 // Display the image.
 var sourceImageUrl = document.getElementById("inputImage").value;
 document.querySelector("#sourceImage").src = sourceImageUrl;

 // Perform the REST API call.
 $.ajax({
```

cognitive-services-quickstart-cod x +

github.com/Azure-Samples/cognitive-services-quickstart-code/tree/master/javascript

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Azure-Samples / cognitive-services-quickstart-code

Code Issues 9 Pull requests 12 Actions Projects Wiki Security Insights

master cognitive-services-quickstart-code / javascript / Go to file

orenmichaely and ormichae Ormichae/quickstartfixes (#252) ... 7c5c225 1 hour ago History

...

Commit	Message	Date
AnomalyDetector	Update Anomaly Detector SDK to t2	5 months ago
AutoSuggest	Initial commit	2 years ago
BingLocal	Updated env variables to standard	15 months ago
BingSpellCheck	Formatting corrections	2 years ago
ComputerVision	split comvis qss	4 days ago
ContentModerator	Initial commit for Human Reviews example (#21)	2 years ago
CustomSearch	Updated file name	2 years ago
CustomVision	Update CustomVisionQuickstart.js	2 months ago
Face	Update sample code using the latest detection model: detection_03, an...	2 months ago
FormRecognizer	add snippets	2 months ago

A large orange arrow points to the "ComputerVision" commit in the list.

<https://github.com/Azure-Samples/cognitive-services-quickstart-code/tree/master/javascript>

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234 lines (205 sloc) | 8.03 KB

[Raw](#) [Blame](#)   

## Quickstart: Extract printed text (OCR) using the Computer Vision REST API and JavaScript

[!NOTE] If you're extracting English language text, consider using the new [Read operation](#). A [JavaScript quickstart](#) is available.

In this quickstart, you'll extract printed text with optical character recognition (OCR) from an image using the Computer Vision REST API. With the [OCR](#) method, you can detect printed text in an image and extract recognized characters into a machine-readable character stream.

### Prerequisites

<https://github.com/Azure-Samples/cognitive-services-quickstart-code/blob/master/javascript/ComputerVision/REST/javascript-print-text.md>

cognitive-services-quickstart-cod x +

github.com/Azure-Samples/cognitive-services-quickstart-code/blob/master/javascript/ComputerVision/REST/javascript-print-text.md

Raw Blame

Copied! ✓

```
<!DOCTYPE html>
<html>
<head>
 <title>OCR Sample</title>
 <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.9.0/jquery.min.js"></script>
</head>
<body>

<script type="text/javascript">
 function processImage() {
 // *****
 // *** Update or verify the following values. ***
 // *****

 var subscriptionKey = document.getElementById("subscriptionKey").value;
 var endpoint = document.getElementById("endpointUrl").value;

 var uriBase = endpoint + "vision/v3.1/ocr";

 // Request parameters.
 var params = {
 "language": "unk",
 "detectOrientation": "true",
 };

 // Display the image.
 var sourceImageUrl = document.getElementById("inputImage").value;
 document.querySelector("#sourceImage").src = sourceImageUrl;

 // Perform the REST API call.
 $.ajax({
```

Copy the code and save it in a HTML file

# Optical Character Recognition (OCR):

Enter the URL to an image of printed text, then click the **Read image** button.

Subscription key:  Endpoint URL:

Image to read:

Response:

Source image:



cognitiveservices-caio - Microsoft

portal.azure.com/#@craigasparine@gmail.onmicrosoft.com/resource/subscriptions/bf350b48-f641-49a2-b7e4-598ce72df8ab/resourceGroups/rg-caio-ai/providers/Microsoft.Cogniti...

Microsoft Azure Upgrade Search resources, services, and docs (G+/-) 1 ? ? caigasparine@gmail.c... DEFAULT DIRECTORY

Create a resource Home Dashboard All services **FAVORITES** All resources Resource groups App Services Function App SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Azure Active Directory Monitor Advisor Security Center Cost Management + Bill...

Home > cognitiveservices-caio

## cognitiveservices-caio | Keys and Endpoint

Cognitive Services

Search (Ctrl+/)

Regenerate Key1 Regenerate Key2

These keys are used to access your Cognitive Service API. Do not share your keys. Store them securely—for example, using Azure Key Vault. We also recommend regenerating these keys regularly. Only one key is necessary to make an API call. When regenerating the first key, you can use the second key for continued access to the service.

Show Keys

KEY 1  
..... 

KEY 2  
..... 

Location  brazilsouth

Endpoint  https://cognitiveservices-caio.cognitiveservices.azure.com/



Go to your COGNITIVE SERVICES and copy your KEY and ENDPOINT

# Optical Character Recognition (OCR):

Enter the URL to an image of printed text, then click the **Read image** button.

Subscription key:  Endpoint URL:



Image to read: <https://upload.wikimedia.org>

Response:

Source image:



Paste your SUBSCRIPTION KEY and your ENDPOINT URL

# Optical Character Recognition (OCR):

Enter the URL to an image of printed text, then click the **Read image** button.

Subscription key: 95dc4c5dc65c4075a62bb8 Endpoint URL: <https://cognitiveservices-cs>

Image to read: <https://upload.wikimedia.org>

Response:

```
{
 "language": "en",
 "textAngle": 0,
 "orientation": "Up",
 "regions": [
 {
 "boundingBox": "21,16,304,451",
 "lines": [
 {
 "boundingBox": "28,16,288,41",
 "words": [
 {
 "boundingBox": "28,16,288,41",
 "text": "NOTHING"
 }
]
 },
 {
 "boundingBox": "27,66,283,52",
 "words": [
 {
 "boundingBox": "27,66,283,52",
 "text": "EXISTS"
 }
]
 }
]
 }
]
}
```

Source image:



Run the HTML code

# Optical Character Recognition (OCR):

Enter the URL to an image of printed text, then click the **Read image** button.

Subscription key: 95dc4c5dc65c4075a62bb8 Endpoint URL: https://cognitiveservices-ca

Image to read: [https://jeroen.github.io/ma](https://jeroen.github.io/ima)

Response:

```
{
 "language": "en",
 "textAngle": 0,
 "orientation": "Up",
 "regions": [
 {
 "boundingBox": "36,92,582,269",
 "lines": [
 {
 "boundingBox": "36,92,544,30",
 "words": [
 {
 "boundingBox": "36,92,60,24",
 "text": "This"
 },
 {
 "boundingBox": "109,92,20,24",
 "text": "is"
 },
 {
 "boundingBox": "141,98,15,18",
 "text": "a"
 },
 {
 "boundingBox": "169,92,32,24",
 "text": "lot"
 }
]
]
]
 }
]
}
```

Source image:

This is a lot of 12 point text to test the  
ocr code and see if it works on all types  
of file format.  
The quick brown dog jumped over the  
lazy fox. The quick brown dog jumped  
over the lazy fox. The quick brown dog  
jumped over the lazy fox. The quick  
brown dog jumped over the lazy fox.

Image link: <https://jeroen.github.io/images/testocr.png>

# Optical Character Recognition (OCR):

Enter the URL to an image of printed text, then click the **Read image** button.

Subscription key: 95dc4c5dc65c4075a62bb8 Endpoint URL: https://cognitiveservices-cs

Image to read: <https://courses.cs.vt.edu/cs>

Response:

```
{
 "language": "en",
 "textAngle": 0,
 "orientation": "Up",
 "regions": [
 {
 "boundingBox": "55,110,459,660",
 "lines": [
 {
 "boundingBox": "227,110,117,10",
 "words": [
 {
 "boundingBox": "227,110,97,10",
 "text": "CHAPTER"
 },
 {
 "boundingBox": "338,110,6,10",
 "text": "i"
 }
]
 },
 {
 "boundingBox": "107,147,354,14",
 "words": [
 {
 "boundingBox": "107,147,32,14",
 "text": "AN"
 }
]
 }
]
 }
]
}
```

Source image:

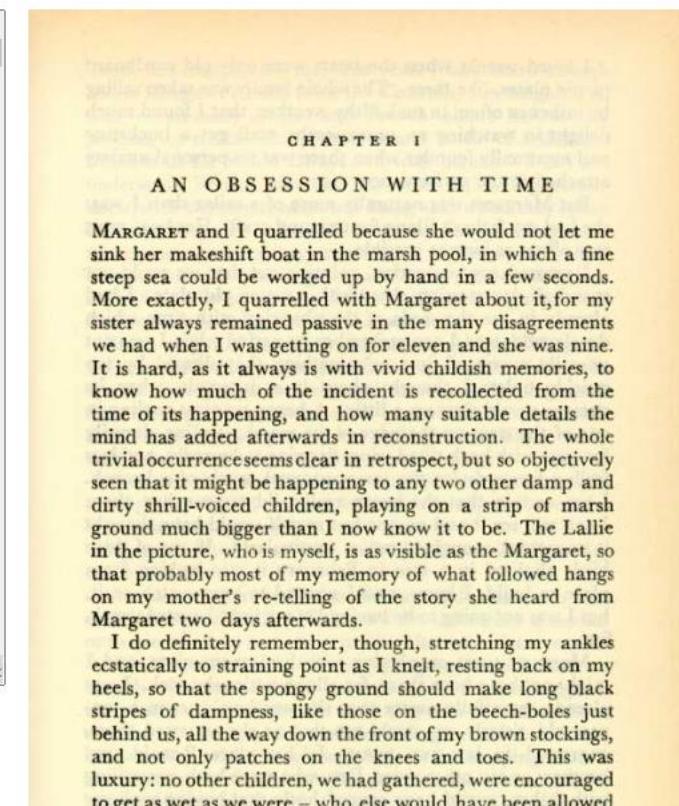


Image link: [https://courses.cs.vt.edu/csonline/AI/Lessons/VisualProcessing/OCRscans\\_files/robertson.jpg](https://courses.cs.vt.edu/csonline/AI/Lessons/VisualProcessing/OCRscans_files/robertson.jpg)

# Optical Character Recognition (OCR):

Enter the URL to an image of printed text, then click the **Read image** button.

Subscription key:  Endpoint URL:

Image to read:

Response:

```
{
 "language": "unk",
 "textAngle": 0,
 "orientation": "NotDetected",
 "regions": []
}
```

Source image:

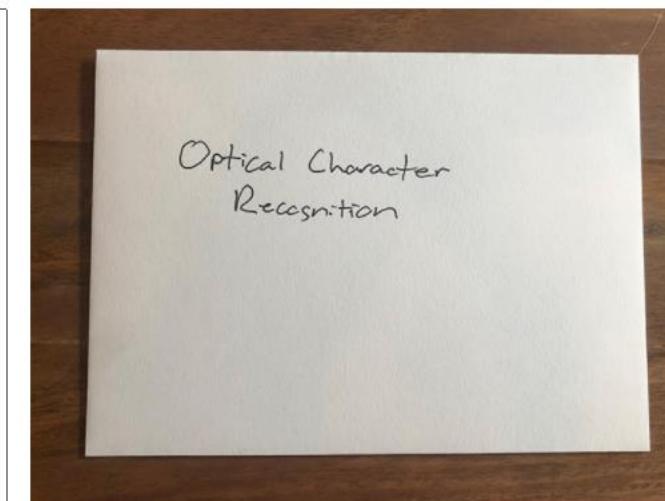


Image link: [https://www.pyimagesearch.com/wp-content/uploads/2020/08/ocr\\_handwriting\\_reco\\_adrian\\_sample.jpg](https://www.pyimagesearch.com/wp-content/uploads/2020/08/ocr_handwriting_reco_adrian_sample.jpg)

**Challenge #4.23**

**Text Analytics**

# What is Text Analytics?

Mine insights in unstructured text using natural language processing (NLP)—no machine learning expertise required. Gain a deeper understanding of customer opinions with sentiment analysis. Identify key phrases and entities such as people, places, and organizations to understand common topics and trends. Classify medical terminology using domain-specific, pretrained models. Evaluate text in a wide range of languages.

*The **Text Analytics API** is a cloud-based service that provides NLP features for **text mining and text analysis**, including **sentiment analysis**, **opinion mining**, **key phrase extraction**, **language detection**, and **named entity recognition**.*

# What is Text Analytics?

We went to Contoso Steakhouse located at midtown NYC last week for a dinner party, and we adore the spot! They provide marvelous food and they have a great menu. The chief cook happens to be the owner (I think his name is John Doe) and he is super nice, coming out of the kitchen and greeted us all. We enjoyed very much dining in the place! The Sirloin steak I ordered was tender and juicy, and the place was impeccably clean. You can even pre-order from their online menu at [www.contososteakhouse.com](http://www.contososteakhouse.com), call 312-555-0176 or send email to [order@contososteakhouse.com](mailto:order@contososteakhouse.com)! The only complaint I have is the food didn't come fast enough. Overall I highly recommend it!



# Text Analytics

- *Detect Language*
- *Extract Key Phrases*
- *Determine Sentiment*
- *Extract Known Entities*

<https://docs.microsoft.com/en-us/azure/cognitive-services/text-analytics/quickstarts/client-libraries-rest-api?tabs=version-3-1&pivots=programming-language-python>

localhost:8889/notebooks/AIDI1006-text-analytics.ipynb

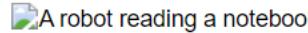
jupyter AIDI1006-text-analytics (autosaved) Logout

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Text Analytics

Natural Language Processing (NLP) is a branch of artificial intelligence (AI) that deals with written and spoken language. You can use NLP to build solutions that extract semantic meaning from text or speech, or that formulate meaningful responses in natural language.

Microsoft Azure *cognitive services* includes the *Text Analytics* service, which provides some out-of-the-box NLP capabilities, including the identification of key phrases in text, and the classification of text based on sentiment.



For example, suppose the fictional *Margie's Travel* organization encourages customers to submit reviews for hotel stays. You could use the Text Analytics service to summarize the reviews by extracting key phrases, determine which reviews are positive and which are negative, or analyze the review text for mentions of known entities such as locations or people.

## View Review Documents

Let's start by taking a look at some hotel reviews that have been left by customers.

The reviews are in text files. To see them, just run the code below by clicking the **Run cell** (>) button to the left of the cell.

```
In [1]: import os

Read the reviews in the /data/reviews folder
reviews_folder = os.path.join('data', 'text', 'reviews')

Create a collection of reviews with id (file name) and text (contents) properties
reviews = []
for file_name in os.listdir(reviews_folder):
 review_text = open(os.path.join(reviews_folder, file_name)).read()
```

localhost:8889/notebooks/AIDI1006-text-analytics.ipynb

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In [2]:

```
cog_key = '1b0fded66c0e4eed9026433d6ef56dcf'
cog_endpoint = 'https://cognitive-services-ai1006.cognitiveservices.azure.com/'

print('Ready to use cognitive services at {} using key {}'.format(cog_endpoint, cog_key))
```

Ready to use cognitive services at <https://cognitive-services-ai1006.cognitiveservices.azure.com/> using key 1b0fded66c0e4eed9026433d6ef56dcf

To use the Text Analytics service in your Cognitive Services resource, you'll need to install the Azure Cognitive Services Text Analytics SDK.

In [3]:

```
! pip install azure-cognitiveservices-language-textanalytics
```

Collecting azure-cognitiveservices-language-textanalytics  
Using cached azure\_cognitiveservices\_language\_textanalytics-0.2.0-py2.py3-none-any.whl (43 kB)  
Requirement already satisfied: msrest>=0.5.0 in c:\programdata\anaconda3\lib\site-packages (from azure-cognitiveservices-language-textanalytics) (0.6.21)  
Requirement already satisfied: azure-common~>1.1 in c:\programdata\anaconda3\lib\site-packages (from azure-cognitiveservices-language-textanalytics) (1.1.27)  
Requirement already satisfied: certifi>=2017.4.17 in c:\programdata\anaconda3\lib\site-packages (from msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (2020.12.5)  
Requirement already satisfied: isodate>=0.6.0 in c:\programdata\anaconda3\lib\site-packages (from msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (0.6.0)  
Requirement already satisfied: requests-oauthlib>=0.5.0 in c:\programdata\anaconda3\lib\site-packages (from msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (1.3.0)  
Requirement already satisfied: requests~>2.16 in c:\programdata\anaconda3\lib\site-packages (from msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (2.25.1)  
Requirement already satisfied: six in c:\programdata\anaconda3\lib\site-packages (from isodate>=0.6.0->msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (1.15.0)  
Requirement already satisfied: chardet<5,>=3.0.2 in c:\programdata\anaconda3\lib\site-packages (from requests~>2.16->msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (4.0.0)  
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\programdata\anaconda3\lib\site-packages (from requests~>2.16->msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (1.26.4)  
Requirement already satisfied: idna<3,>=2.5 in c:\programdata\anaconda3\lib\site-packages (from requests~>2.16->msrest>=0.5.0->azure-cognitiveservices-language-textanalytics) (2.10)

Fill out the information about your URL endpoint and keys (COGNITIVE SERVICES)

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In [4]:

```
import os
from azure.cognitiveservices.language.textanalytics import TextAnalyticsClient
from msrest.authentication import CognitiveServicesCredentials

Get a client for your text analytics cognitive service resource
text_analytics_client = TextAnalyticsClient(endpoint=cog_endpoint,
 credentials=CognitiveServicesCredentials(cog_key))

Analyze the reviews you read from the /data/reviews folder earlier
language_analysis = text_analytics_client.detect_language(documents=reviews)

print detected language details for each review
for review_num in range(len(reviews)):
 # print the review id
 print(reviews[review_num]['id'])

 # Get the language details for this review
 lang = language_analysis.documents[review_num].detected_languages[0]
 print(' - Language: {} \n - Code: {} \n - Score: {}'.format(lang.name, lang.iso6391_name, lang.score))

 # Add the detected language code to the collection of reviews (so we can do further analysis)
 reviews[review_num]["language"] = lang.iso6391_name
```

review1.txt

- Language: English
- Code: en
- Score: 1.0

review2.txt

- Language: English

Detect Language - CODE

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# Analyze the reviews you read from the /data/reviews folder earlier  
language\_analysis = text\_analytics\_client.detect\_language(documents=reviews)  
  
# print detected language details for each review  
for review\_num in range(len(reviews)):  
 # print the review id  
 print(reviews[review\_num]['id'])  
  
 # Get the language details for this review  
 lang = language\_analysis.documents[review\_num].detected\_languages[0]  
 print(' - Language: {} \n - Code: {} \n - Score: {}'.format(lang.name, lang.iso6391\_name, lang.score))  
  
 # Add the detected language code to the collection of reviews (so we can do further analysis)  
 reviews[review\_num]["language"] = lang.iso6391\_name

review1.txt  
- Language: English  
- Code: en  
- Score: 1.0

review2.txt  
- Language: English  
- Code: en  
- Score: 1.0

review3.txt  
- Language: English  
- Code: en  
- Score: 1.0

review4.txt  
- Language: English  
- Code: en  
- Score: 1.0

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In [5]:

```
Use the client and reviews you created in the previous code cell to get key phrases
key_phrase_analysis = text_analytics_client.key_phrases(documents=reviews)

print key phrases for each review
for review_num in range(len(reviews)):
 # print the review id
 print(reviews[review_num]['id'])

 # Get the key phrases in this review
 print('\nKey Phrases:')
 key_phrases = key_phrase_analysis.documents[review_num].key_phrases
 # Print each key phrase
 for key_phrase in key_phrases:
 print('\t', key_phrase)
 print('\n')

review1.txt
```

Key Phrases:

- Good Hotel
- good service
- Clean rooms
- Royal Hotel
- great location
- Buckingham Palace
- Westminster Abbey
- fish
- West coast
- lounge
- bedroom

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review1.txt

Key Phrases:

- Good Hotel
- good service
- Clean rooms
- Royal Hotel
- great location
- Buckingham Palace
- Westminster Abbey
- fish
- West coast
- lounge
- bedroom
- enormous bathroom
- group
- kitchen
- London
- UK
- taster menu
- Michelin Star
- staff
- courtyard

review2.txt

Key Phrases:

- old hotel
- Royal Hotel
- Tired hotel
- London
- United Kingdom
- room furnishings
- poor service

Extract Key Phrases – RESULT

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In [6]:

```
Use the client and reviews you created previously to get sentiment scores
sentiment_analysis = text_analytics_client.sentiment(documents=reviews)

Print the results for each review
for review_num in range(len(reviews)):

 # Get the sentiment score for this review
 sentiment_score = sentiment_analysis.documents[review_num].score

 # Classify 'positive' if more than 0.5,
 if sentiment_score < 0.5:
 sentiment = 'negative'
 else:
 sentiment = 'positive'

 # print file name and sentiment
 print('{0} : {1} ({2})'.format(reviews[review_num]['id'], sentiment, sentiment_score))

review1.txt : positive (0.9999973773956299)
review2.txt : negative (5.662441253662109e-07)
review3.txt : positive (0.9999995231628418)
review4.txt : negative (2.0623207092285156e-05)
```

## Determine Sentiment

It might be useful to classify the reviews as *positive* or *negative* based on a *sentiment score*. Again, you can use the Text Analytics service to do this.

## Extract Known Entities

*Entities* are things that might be mentioned in text that reference some commonly understood type of item. For example, a location, a person, or a date. Let's suppose you're interested in dates and places mentioned in the reviews - you can use the following code to find them.

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 sentiment = 'negative'
 else:
 sentiment = 'positive'

 # print file name and sentiment
 print('{0} : {1} ({2})'.format(reviews[review_num]['id'], sentiment, sentiment_score))
```

review1.txt : positive (0.9999973773956299)  
review2.txt : negative (5.662441253662109e-07)  
review3.txt : positive (0.9999995231628418)  
review4.txt : negative (2.0623207092285156e-05)

## Determine Sentiment

It might be useful to classify the reviews as *positive* or *negative* based on a *sentiment score*. Again, you can use the Text Analytics service to do this.

## Extract Known Entities

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In [7]:

```
Use the client and reviews you created previously to get named entities
entity_analysis = text_analytics_client.entities(documents=reviews)

Print the results for each review
for review_num in range(len(reviews)):
 print(reviews[review_num]['id'])
 # Get the named entitites in this review
 entities = entity_analysis.documents[review_num].entities
 for entity in entities:
 # Only get location entitites
 if entity.type in ['DateTime', 'Location']:
 link = ('' + entity.wikipedia_url + '') if entity.wikipedia_id is not None else ''
 print(' - {}: {} {}'.format(entity.type, entity.name, link))
```

review1.txt

- Location: The Royal Hotel ([https://en.wikipedia.org/wiki/The\\_Royal\\_Hotel](https://en.wikipedia.org/wiki/The_Royal_Hotel))
- Location: London (<https://en.wikipedia.org/wiki/London>)
- DateTime: 3/2/2018
- Location: Buckingham Palace ([https://en.wikipedia.org/wiki/Buckingham\\_Palace](https://en.wikipedia.org/wiki/Buckingham_Palace))
- Location: Westminster Abbey ([https://en.wikipedia.org/wiki/Westminster\\_Abbey](https://en.wikipedia.org/wiki/Westminster_Abbey))
- Location: India (<https://en.wikipedia.org/wiki/India>)
- Location: West Coast Main Line ([https://en.wikipedia.org/wiki/West\\_Coast\\_Main\\_Line](https://en.wikipedia.org/wiki/West_Coast_Main_Line))

review2.txt

- Location: The Royal Hotel ([https://en.wikipedia.org/wiki/The\\_Royal\\_Hotel](https://en.wikipedia.org/wiki/The_Royal_Hotel))
- Location: London (<https://en.wikipedia.org/wiki/London>)
- Location: London
- Location: United Kingdom
- DateTime: 5/6/2018

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review1.txt

- Location: The Royal Hotel ([https://en.wikipedia.org/wiki/The\\_Royal\\_Hotel](https://en.wikipedia.org/wiki/The_Royal_Hotel))
- Location: London (<https://en.wikipedia.org/wiki/London>)
- DateTime: 3/2/2018
- Location: Buckingham Palace ([https://en.wikipedia.org/wiki/Buckingham\\_Palace](https://en.wikipedia.org/wiki/Buckingham_Palace))
- Location: Westminster Abbey ([https://en.wikipedia.org/wiki/Westminster\\_Abbey](https://en.wikipedia.org/wiki/Westminster_Abbey))
- Location: India (<https://en.wikipedia.org/wiki/India>)
- Location: West Coast Main Line ([https://en.wikipedia.org/wiki/West\\_Coast\\_Main\\_Line](https://en.wikipedia.org/wiki/West_Coast_Main_Line))

review2.txt

- Location: The Royal Hotel ([https://en.wikipedia.org/wiki/The\\_Royal\\_Hotel](https://en.wikipedia.org/wiki/The_Royal_Hotel))
- Location: London (<https://en.wikipedia.org/wiki/London>)
- Location: London
- Location: United Kingdom
- DateTime: 5/6/2018
- DateTime: since 1950's
- DateTime: now
- Location: British Museum ([https://en.wikipedia.org/wiki/British\\_Museum](https://en.wikipedia.org/wiki/British_Museum))

review3.txt

- Location: Lombardy (<https://en.wikipedia.org/wiki/Lombardy>)
- Location: San Francisco ([https://en.wikipedia.org/wiki/San\\_Francisco](https://en.wikipedia.org/wiki/San_Francisco))
- DateTime: 8/16/2018
- DateTime: August
- Location: Chestnut Street (Philadelphia) ([https://en.wikipedia.org/wiki/Chestnut\\_Street\\_\(Philadelphia\)](https://en.wikipedia.org/wiki/Chestnut_Street_(Philadelphia)))
- Location: Marina District, San Francisco ([https://en.wikipedia.org/wiki/Marina\\_District,\\_San\\_Francisco](https://en.wikipedia.org/wiki/Marina_District,_San_Francisco))
- Location: Marina
- Location: Golden Gate Bridge ([https://en.wikipedia.org/wiki/Golden\\_Gate\\_Bridge](https://en.wikipedia.org/wiki/Golden_Gate_Bridge))
- Location: Lombard Street (San Francisco) ([https://en.wikipedia.org/wiki/Lombard\\_Street\\_\(San\\_Francisco\)](https://en.wikipedia.org/wiki/Lombard_Street_(San_Francisco)))

review4.txt

- Location: Lombard, Illinois ([https://en.wikipedia.org/wiki/Lombard,\\_Illinois](https://en.wikipedia.org/wiki/Lombard,_Illinois))
- Location: San Francisco ([https://en.wikipedia.org/wiki/San\\_Francisco](https://en.wikipedia.org/wiki/San_Francisco))
- Location: Lombard Street (San Francisco) ([https://en.wikipedia.org/wiki/Lombard\\_Street\\_\(San\\_Francisco\)](https://en.wikipedia.org/wiki/Lombard_Street_(San_Francisco)))
- Location: Lombard
- Location: Golden Gate Bridge ([https://en.wikipedia.org/wiki/Golden\\_Gate\\_Bridge](https://en.wikipedia.org/wiki/Golden_Gate_Bridge))
- DateTime: from early morning
- DateTime: night

Extract Known Entities – RESULT

**Challenge #4.24**

**Speech (Cognitive Services)**

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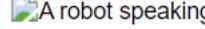
localhost:8888/notebooks/AIDI1006-speech.ipynb

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Speech

Increasingly, we expect to be able to communicate with artificial intelligence (AI) systems by talking to them, often with the expectation of a spoken response.



*Speech recognition* (an AI system interpreting spoken language) and *speech synthesis* (an AI system generating a spoken response) are the key components of a speech-enabled AI solution.

## Create a Cognitive Services resource

To build software that can interpret audible speech and respond verbally, you can use the **Speech** cognitive service, which provides a simple way to transcribe spoken language into text and vice-versa.

If you don't already have one, use the following steps to create a **Cognitive Services** resource in your Azure subscription:

1. In another browser tab, open the Azure portal at <https://portal.azure.com>, signing in with your Microsoft account.
2. Click the **+ Create a resource** button, search for *Cognitive Services*, and create a **Cognitive Services** resource with the following settings:
  - **Name:** *Enter a unique name.*
  - **Subscription:** *Your Azure subscription.*
  - **Location:** *Any available location.*
  - **Pricing tier:** S0
  - **Resource group:** *Create a resource group with a unique name.*
3. Wait for deployment to complete. Then go to your cognitive services resource, and on the **Overview** page, click the link to manage the keys for the service. You will need the endpoint and keys to connect to your cognitive services resource from client applications.

### Get the Key and Endpoint for your Cognitive Services resource

Open the file: AIDI1006-speech

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localhost:8888/notebooks/AIDI1006-speech.ipynb

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Speech recognition

Suppose you want to build a home automation system that accepts spoken instructions, such as "turn the light on" or "turn the light off". Your application needs to be able to take the audio-based input (your spoken instruction), and interpret it by transcribing it to text that it can then parse and analyze.

Now you're ready to transcribe some speech. The input can be a microphone or an audio file. In this case, you'll use an audio file.

Run the cell below to use the speech-to-text capabilities of the Speech service to transcribe the audio.

In [6]:

```
import os
import IPython
from azure.cognitiveservices.speech import SpeechConfig, SpeechRecognizer, AudioConfig

Get spoken command from audio file
file_name = 'light-off.wav'
audio_file = os.path.join('data', 'speech', file_name)

Configure speech recognizer
speech_config = SpeechConfig(cog_key, cog_region)
audio_config = AudioConfig(filename=audio_file) # Use file instead of default (microphone)
speech_recognizer = SpeechRecognizer(speech_config, audio_config)

Use a one-time, synchronous call to transcribe the speech
speech = speech_recognizer.recognize_once()

Play audio and show transcribed text
IPython.display.display(IPython.display.Audio(audio_file, autoplay=True),
 IPython.display.HTML(speech.text))
```

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speech_config = SpeechConfig(cog_key, cog_region)
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speech_recognizer = SpeechRecognizer(speech_config, audio_config)

Use a one-time, synchronous call to transcribe the speech
speech = speech_recognizer.recognize_once()

Play audio and show transcribed text
IPython.display.display(IPython.display.Audio(audio_file, autoplay=True),
IPython.display.HTML(speech.text))
```

▶ 0:02 / 0:02 ⏸ ⏹ :

Turn the light off.

Try changing the **file\_name** variable to *light-off.wav*, and run the cell again. The service should be able to transcribe both files correctly to text.

Home Page - Select or create a n × AIDI1006-speech - Jupyter Noteb × cognitive-services-ai1006 - Micro × +

localhost:8888/notebooks/AIDI1006-speech.ipynb

jupyter AIDI1006-speech (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [12]:

```
import os
import IPython
from azure.cognitiveservices.speech import SpeechConfig, SpeechSynthesizer, AudioConfig

Get text to be spoken
response_text = 'Turning the light on.'

Configure speech synthesis
speech_config = SpeechConfig(cog_key, cog_region)
output_file = os.path.join('data', 'speech', 'response.wav')
audio_output = AudioConfig(filename=output_file) # Use a file instead of default (speakers)
speech_synthesizer = SpeechSynthesizer(speech_config, audio_output)

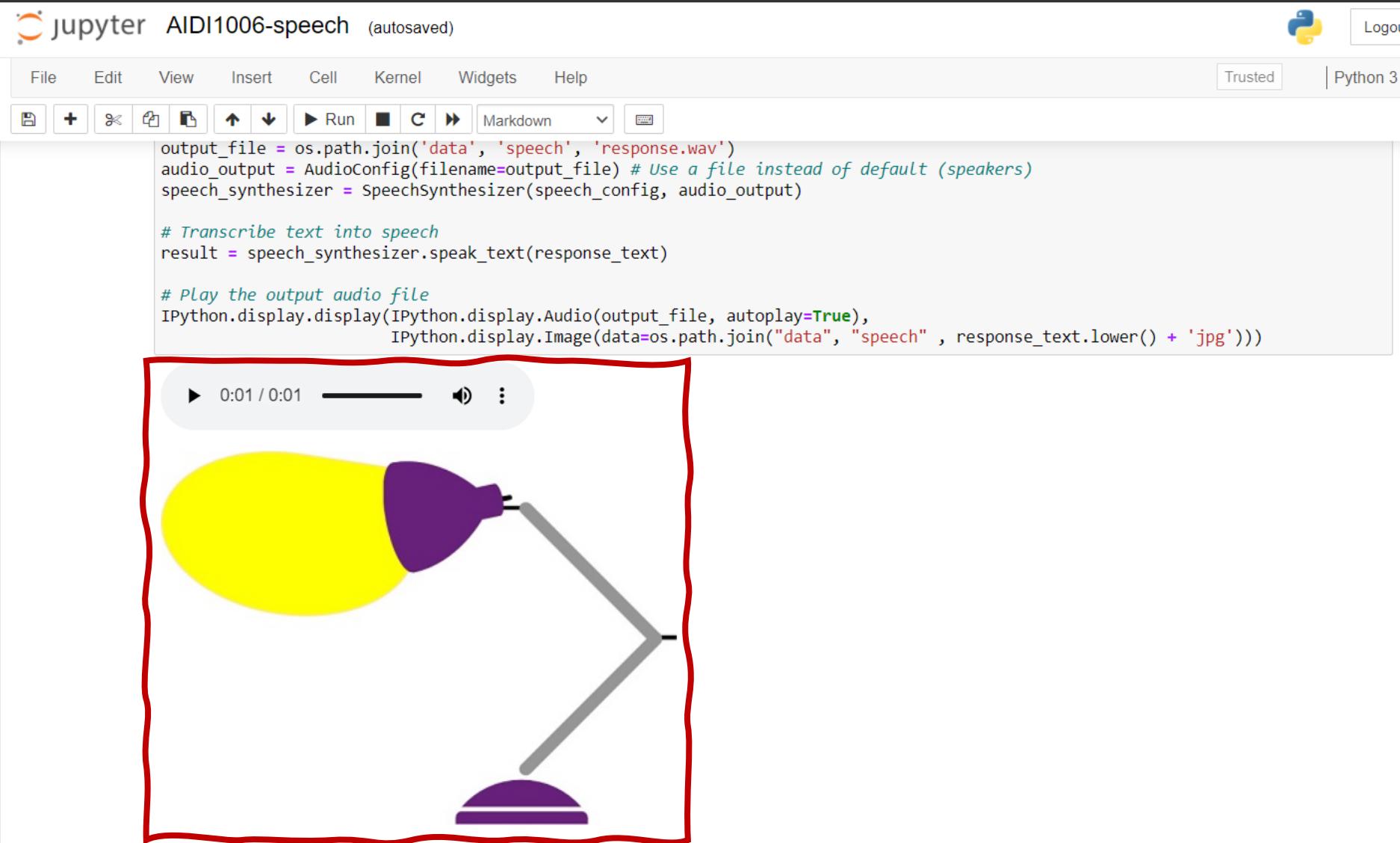
Transcribe text into speech
result = speech_synthesizer.speak_text(response_text)

Play the output audio file
IPython.display.display(IPython.display.Audio(output_file, autoplay=True),
IPython.display.Image(data=os.path.join("data", "speech", response_text.lower() + 'jpg')))
```

▶ 0:01 / 0:01 ━ ━ ━ ━ ━

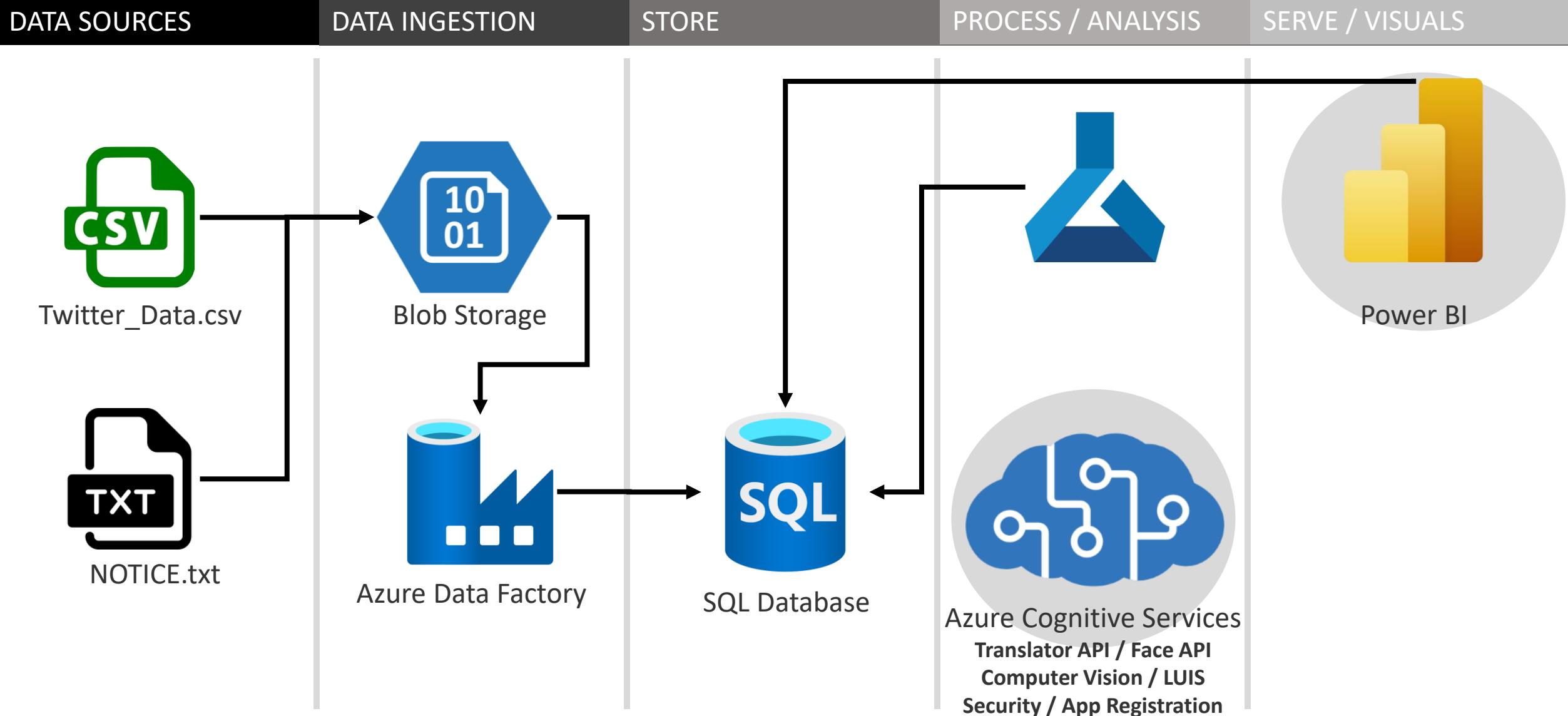


Speech synthesis – CODE



Try changing the `response_text` variable to *Turning the light off.* (including the period at the end) and run the cell again to hear the result.

# Data Architecture so far...



# References

Official Prep Training Exam **AI-102: Designing and Implementing a Microsoft Azure AI Solution**

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# Thank you! ;-)

Please e-mail me the screenshots of your final steps for each component / service to validate your bonus points.