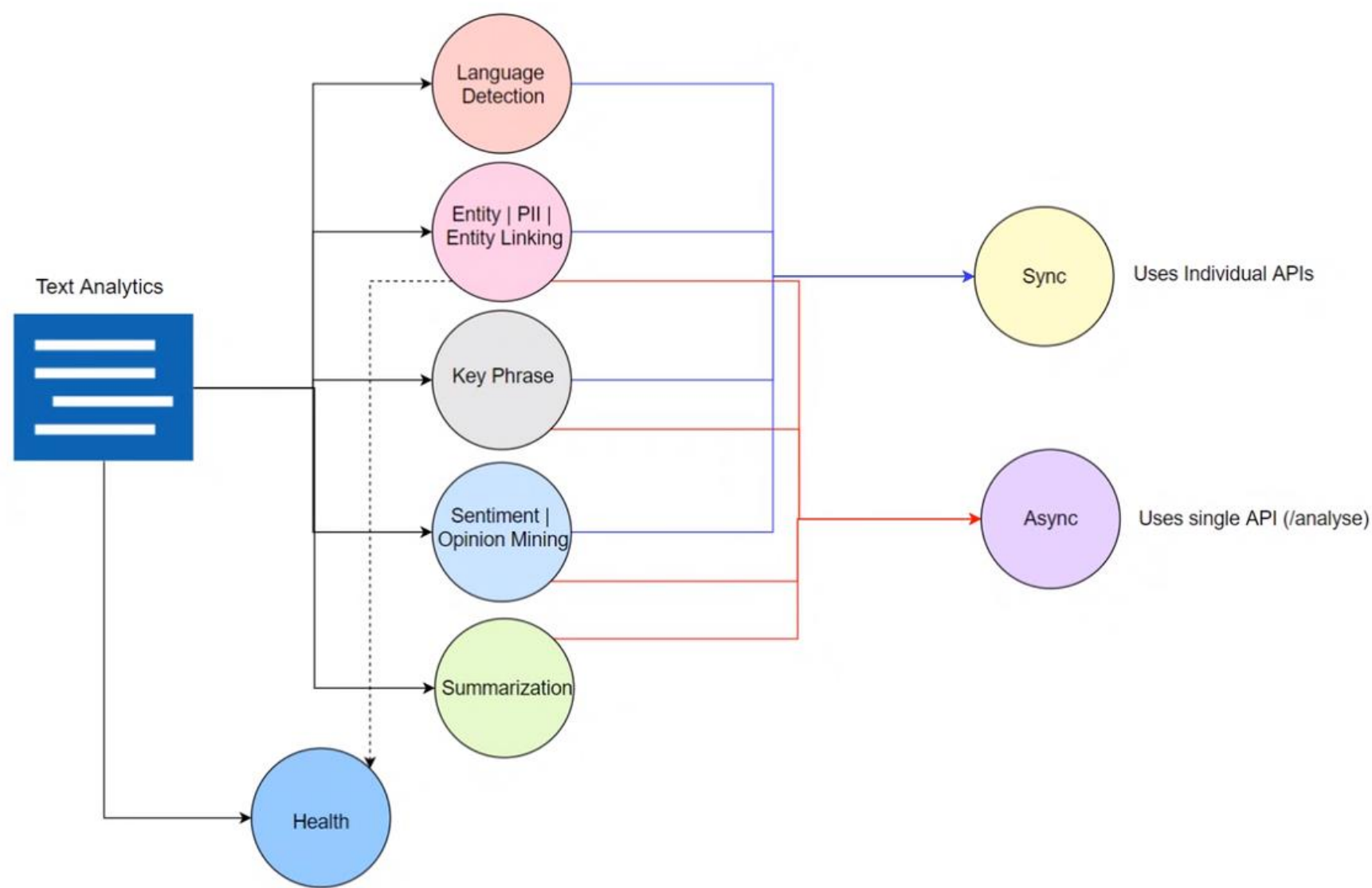


Document Name	HOL – Azure Text Analytics Service v3.2
Author	Shiva S Tomar & Anupreet Kaur
Reviewer	
Executive Summary	Azure Cognitive APIs enable the developers of all skill levels to add human intelligence in their applications. The services are designed for developers interested in pursuing DS/AI/ML skills and people who want to acquire the deep technical knowledge on the Cognitive APIs of Azure, despite not having Machine Learning expertise.
Purpose	This document is created to help you gain level 350 working knowledge on Azure Text Analytics Service. You will be able to explore each functionality offered by the service through the API and observe the outcomes. We have also shared a sample dataset to replicate what we have used to create the content of this workshop. Once you complete these labs, you'll go from <b><i>Zero to Hero</i></b> on the respective Azure Cognitive service and should be able to <b><i>Demo, Develop and Deploy</i></b> your own custom use cases. The important thing to note here is that you don't need to refer any other documents to complete this workshop.
Intent of Guide	This workshop is designed to help you explore all the features of a service offered through their APIs. The diagram shown in the beginning of the document is its functional Architecture; talking about the functionalities offered by the service in a flow. It also covers the Concepts, How-to and best practices about the service. This document is not intended to enable you with scenarios of deployment in production.

Service brief: Azure Text Analytics Service

Azure’s Text Analytics API uses advanced Natural Language Processing & Deep Learning models to extract useful information from text, such as Language, Sentiment, Opinion, Key Phrases, Named Entities, PII, Text Summary etc.

Diagram: Functional Architecture



Text Analytics API provides following prominent capabilities as features, which are accessible through synchronous & asynchronous calls :

1. **Language Detection** – The model enables you to detect the language of the input text
2. **PII / Entity extraction & linking** – The model fetches you key entities such as Names, Landmarks, Emails, Dates, Phone number, Organization etc. Wikipedia links for prominent entities are also returned as part of Entity Linking. For more information on the entities extracted, please refer the link [here](#).
3. **Key phrase extraction** – The model enables you to extract key phrases from the input text.
4. **Sentiment & Opinion mining** – The model scores the individual input sentences into Negative, Neutral & Positive sentences. Basis this, it also derives an overall sentiment for the document. Opinion Mining is Aspect-based Sentiment Analysis in Natural Language Processing (NLP), this feature provides more granular information about the opinions related to words (such as the attributes of products or services) in the text.
5. **Summarization** – The model helps you summarize the input text. There are 2 approaches that the model takes :
  - a. **Extractive** : produces a summary by extracting sentences that collectively represent the most important or relevant information within the original content.
  - b. **Abstractive** : produces a summary based on contextual summarisation.

As shown in the function architecture above, each of these features, except for summarization, are available as standalone synchronous API calls. In a new feature in v3.2, Text Analytics now offers an Asynchronous API, using which you can leverage all the features in a single API call. Language detection is only available as a standalone API and is not a part of the async API.

In addition to all these functionalities, Text Analytics service offers a separate Healthcare Model. This helps you recognize healthcare related entities (diagnosis, dosage, drugs, conditions, symptoms, etc) and their relations.

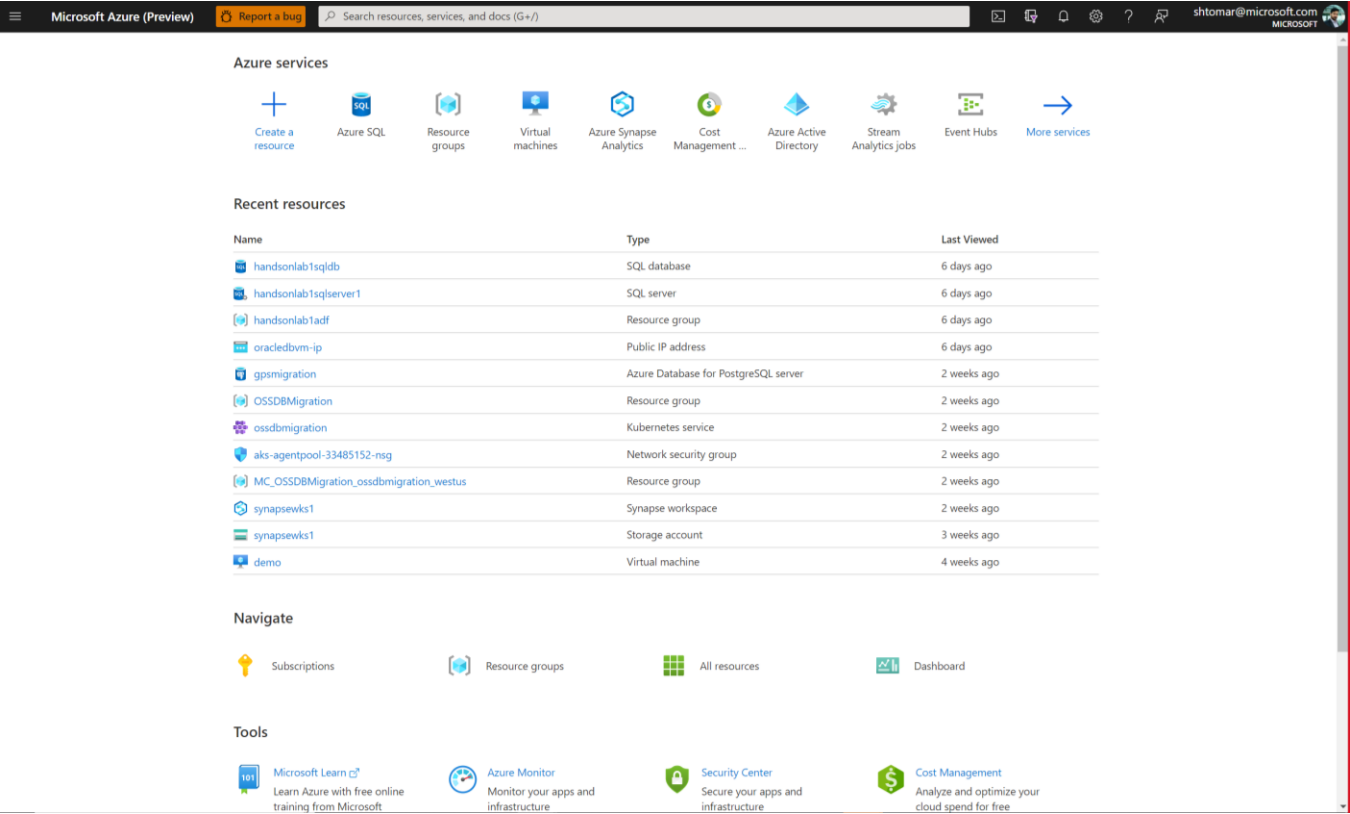
These APIs are available both as REST APIs and language specific SDKs. You can deploy the models on the cloud or on the edge.

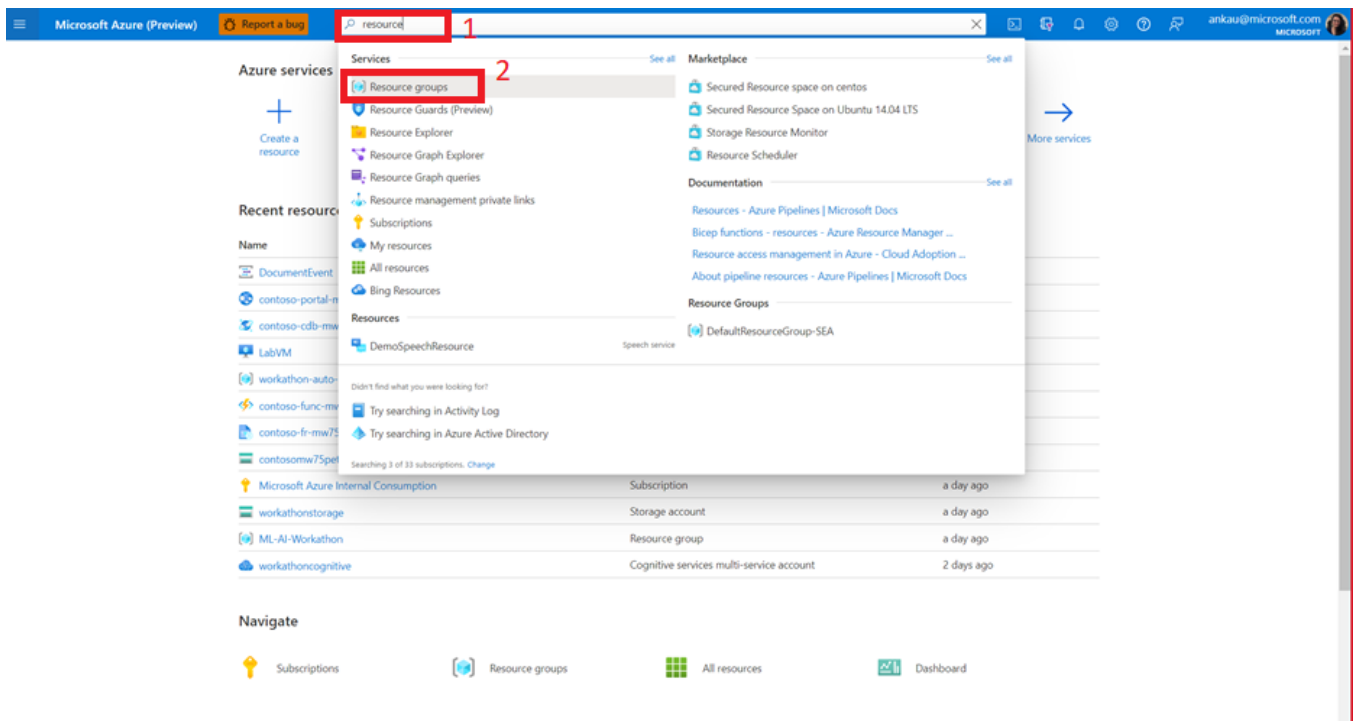
Step by step hands on guide to go from Zero to Hero

Pre-requisites

- Download & Install Postman
  - Postman is a free tool which allows you to make API calls
  - You can download the desktop application or get started using the web version ([Download Postman | Try Postman for Free](#))
- An active Azure Account
  - You can use your current Azure Subscription or get started by creating a free trial account (<https://azure.microsoft.com/en-in/free>)
- Download the resources from Data folder

Let’s get started!

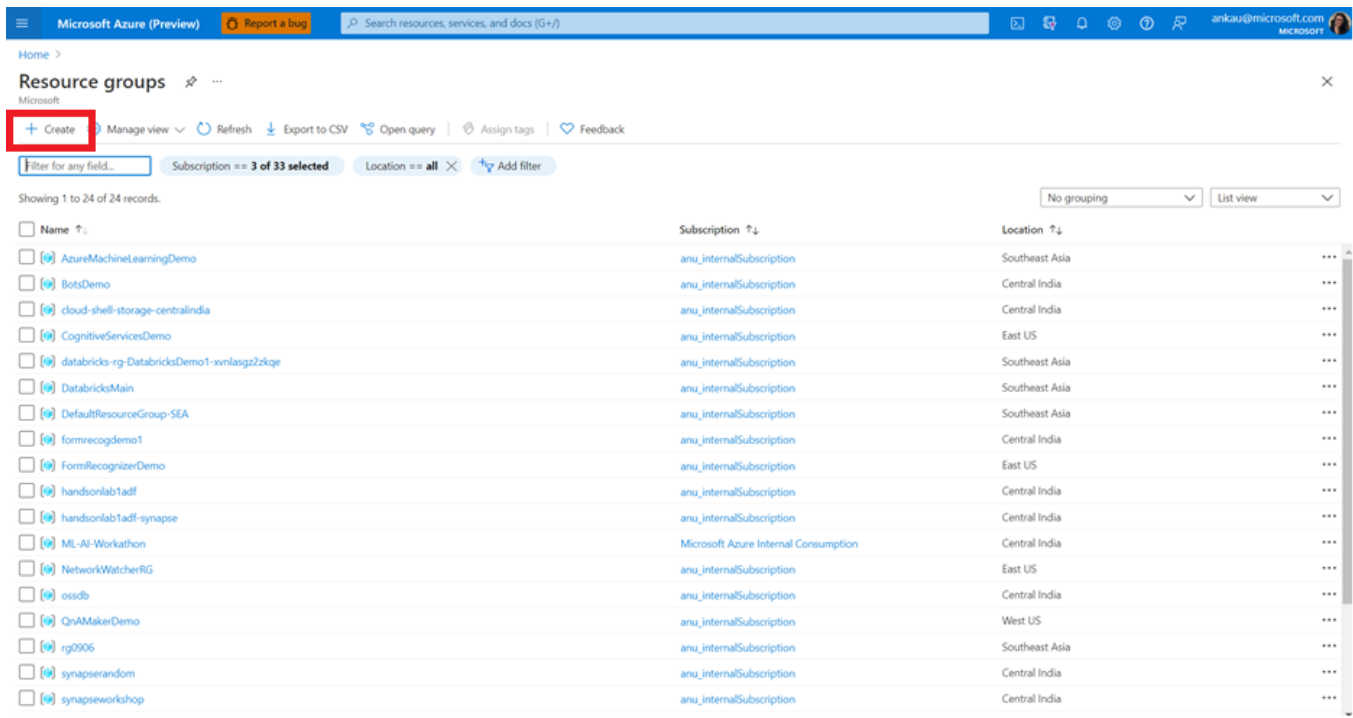
Screenshots	Steps & Significance
	Sign into your Azure Portal.



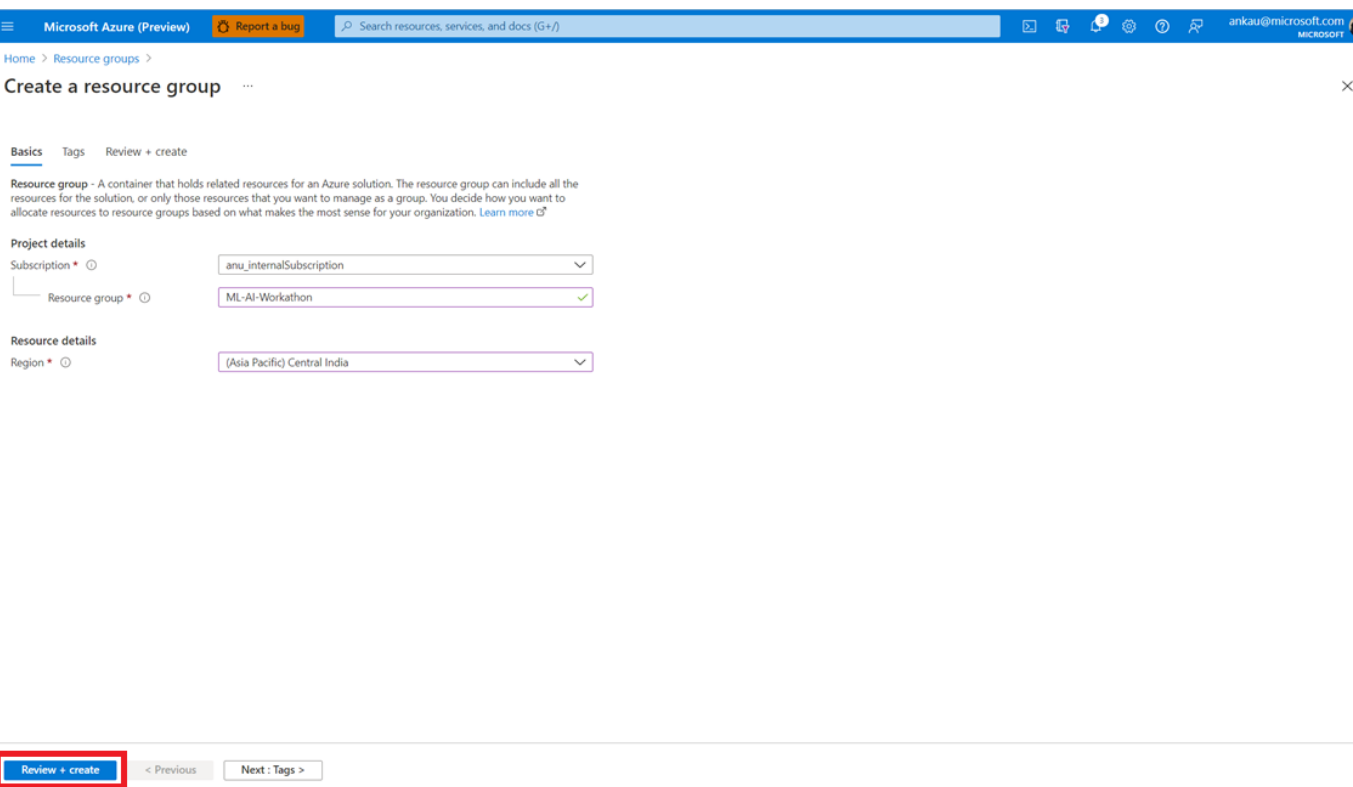
## Create a Resource Group

Follow steps 1 & 2 to create a resource group.

You can skip this step if you already have a Resource Group in place.



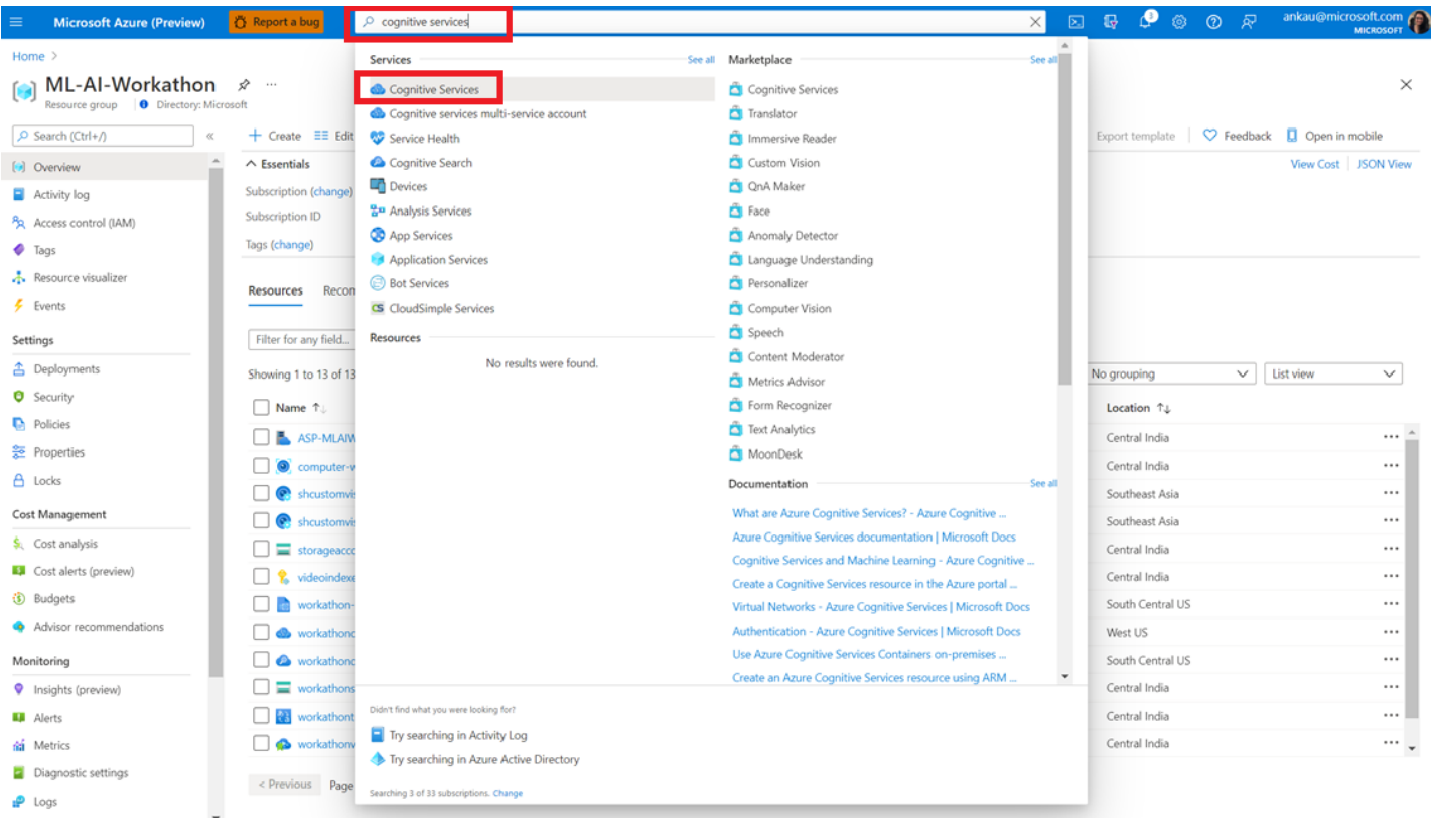
Click create to create a new resource group.



Enter the details –

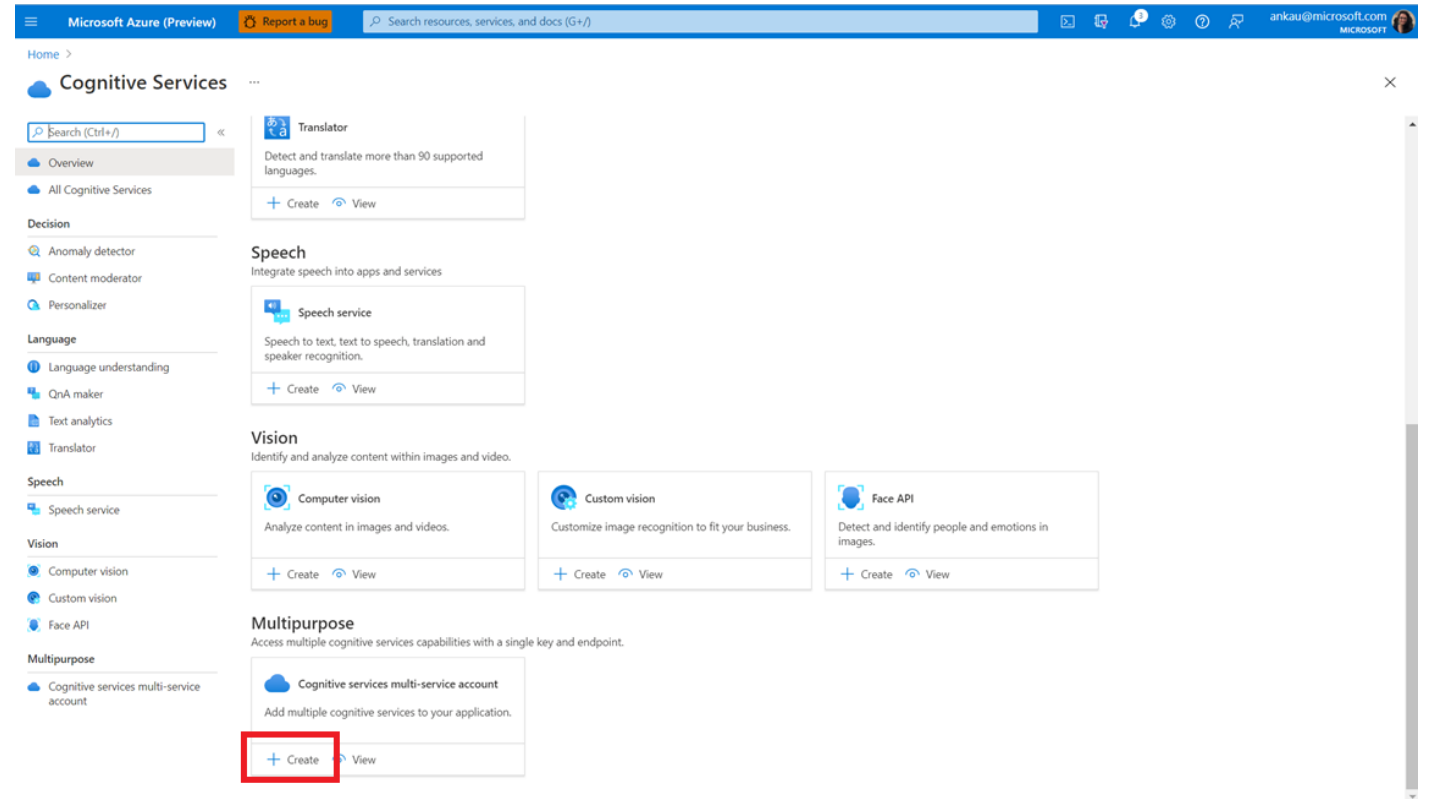
1. Subscription : Azure subscription in which you want to deploy the resource group
2. Resource Group : Name of your choice for the resource group
3. Region : Region where you want to deploy the resource group

Click Review + Create.



Once the resource group is created, search for Cognitive Services in the search bar above and select Cognitive Services.

You can skip this step if you already have a Cognitive Service in place for Text Analytics. This can be a multipurpose Azure Cognitive Resource or a Text Analytics Resource.



### Create a multipurpose cognitive service

**Significance** : A multipurpose Cognitive Service account allows you to leverage the same resource for many cognitive services, which include :

- [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
- [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

In this lab, we used a multipurpose Cognitive Service account since we would be learning about all the above-mentioned services. However, you can also spin up individual services to execute these labs or for your development / production scenarios. The only difference is spinning up individual services allows logical separation from workspace standpoint and easy monitoring of billability.

Microsoft Azure (Preview)

Report a bug

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

ankau@microsoft.com

Home > Cognitive Services >

Create Cognitive Services

BasicsIdentityTagsReview + 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 \*

anu\_internalSubscription

Resource group \*

(New) ML-AI-Workathon

Create new

Instance details

Region \*

West US

Location specifies the region only for included regional services. This does not specify a region for included non-regional services. Custom Vision service is not available in this region. Click here for more details.

Name \*

workathoncognitive

Pricing tier \*

Standard S0

[View full pricing details](#)

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

Review + create

< Previous

Next: Identity >

Enter the details to create a new cognitive service as follows -

Project details	Description
Subscription	Select one of your available Azure subscriptions.
Resource group	The Azure resource group that will contain your Cognitive Services resource. You can create a new group or add it to a pre-existing group.
Region	The location of your cognitive service instance. Different locations may introduce latency but have no impact on the runtime availability of your resource.
Name	A descriptive name for your cognitive services resource.
Pricing tier	The cost of your Cognitive Services account depends on the options you choose and your usage.

Click Review + Create.

Microsoft Azure (Preview)

Report a bug

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

ankau@microsoft.com

Home > Cognitive Services >

Create Cognitive Services

BasicsIdentityTagsReview + create

Validation Passed

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

anu\_internalSubscription

Resource group

ML-AI-Workathon

Region

West US

Name

workathoncognitive

Pricing tier

Standard S0

Identity

Identity type

None

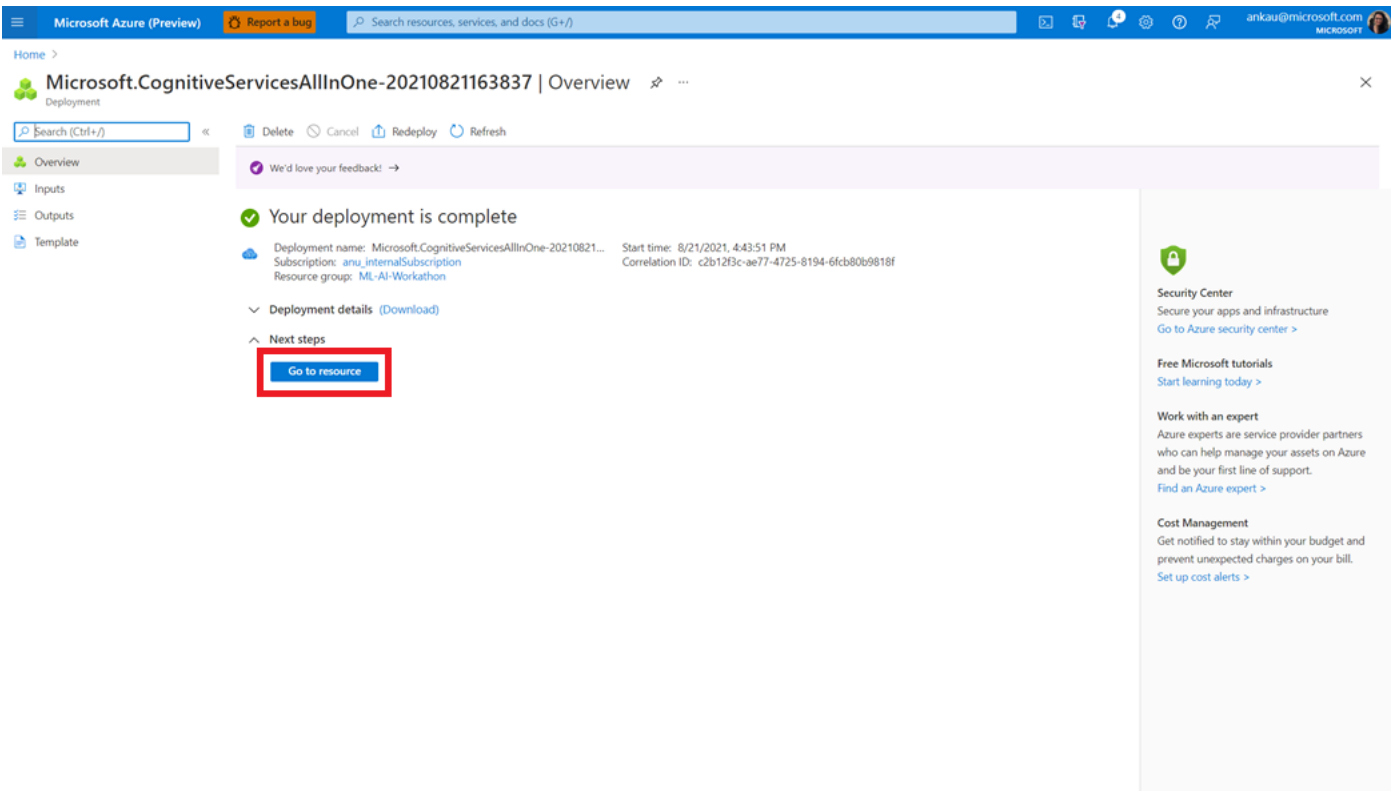
Create

< Previous

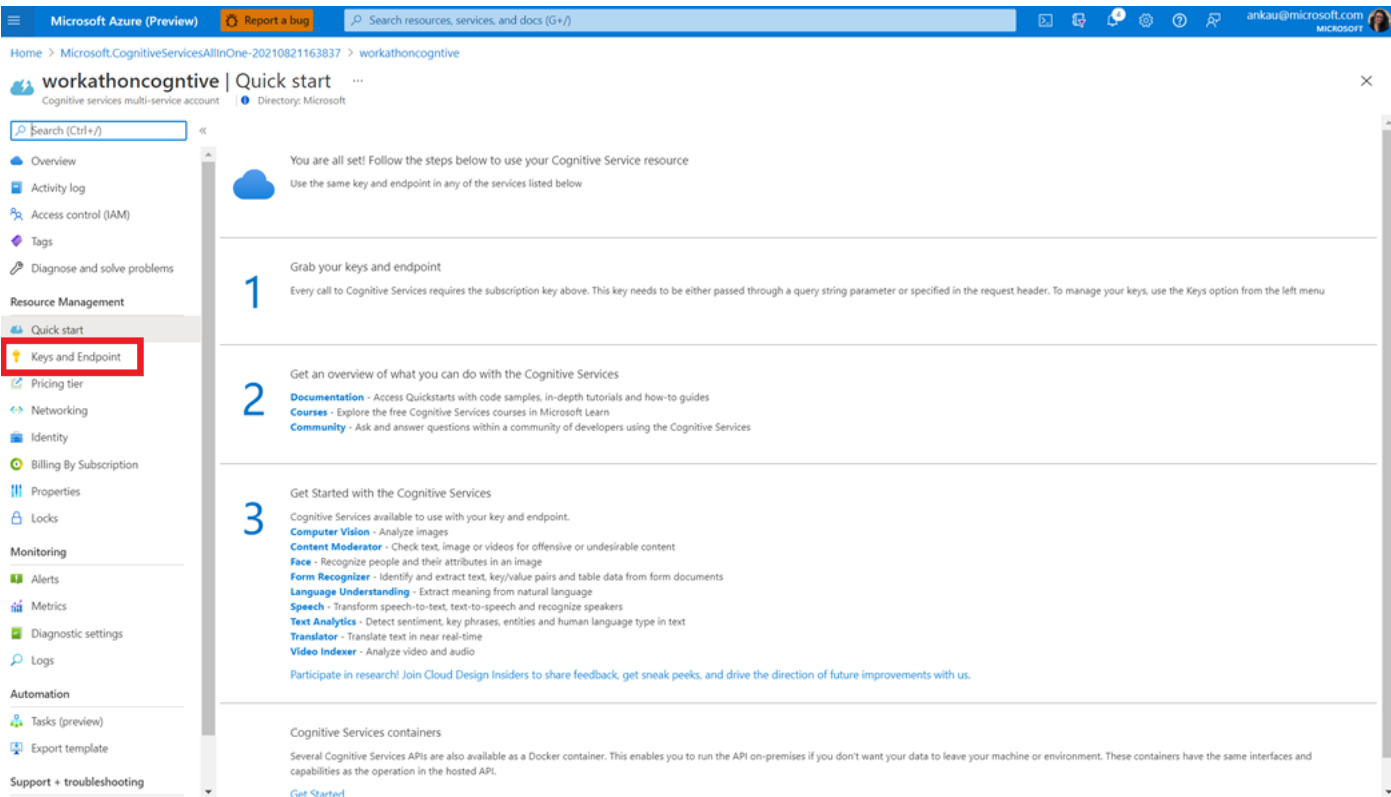
Next

[Download a template for automation](#)

Verify the details and click Create.



After the resource has been deployed, click Go to Resource.

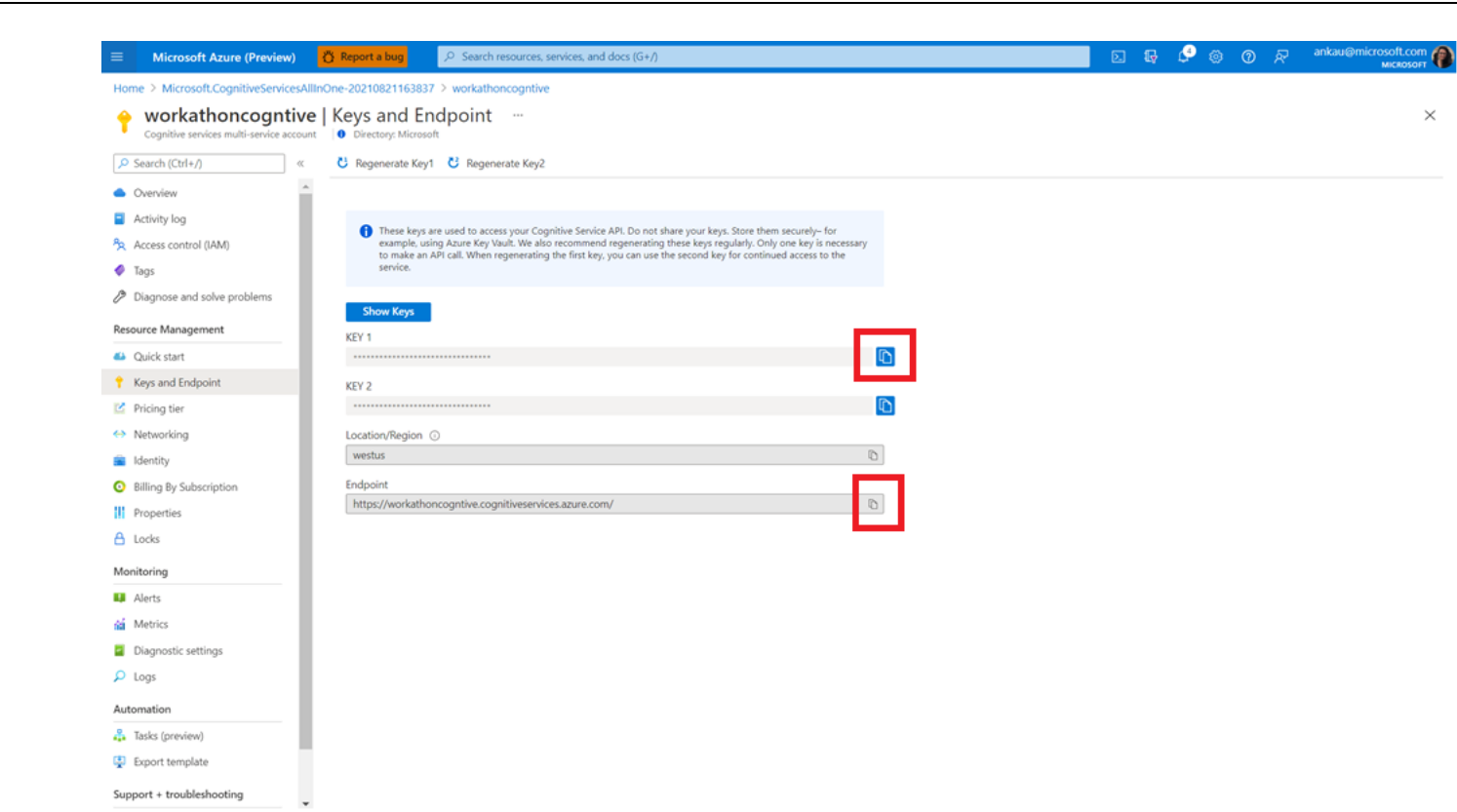


### Copy keys & endpoints

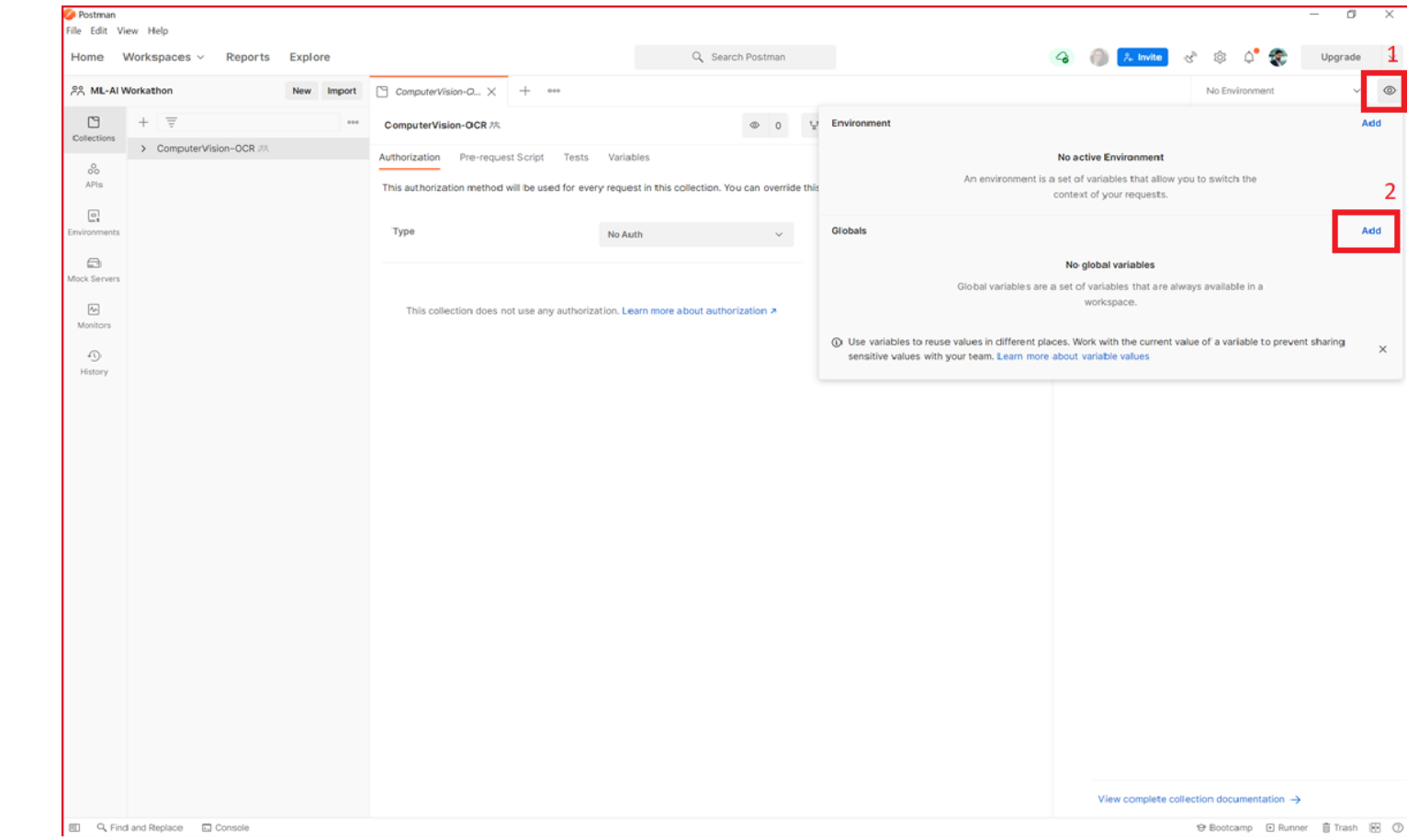
On the Quick start page, you can find details about different cognitive services and can click the hyperlinks to learn more.

Click Key and Endpoints.





Copy the Key and Endpoint. Paste these in a notepad. You will leverage these in the next step, while setting up the global variables in Postman.



We have now switched the interface to Postman to explore the Text Analytics Service. If you haven't downloaded the Postman client, you can use web version.

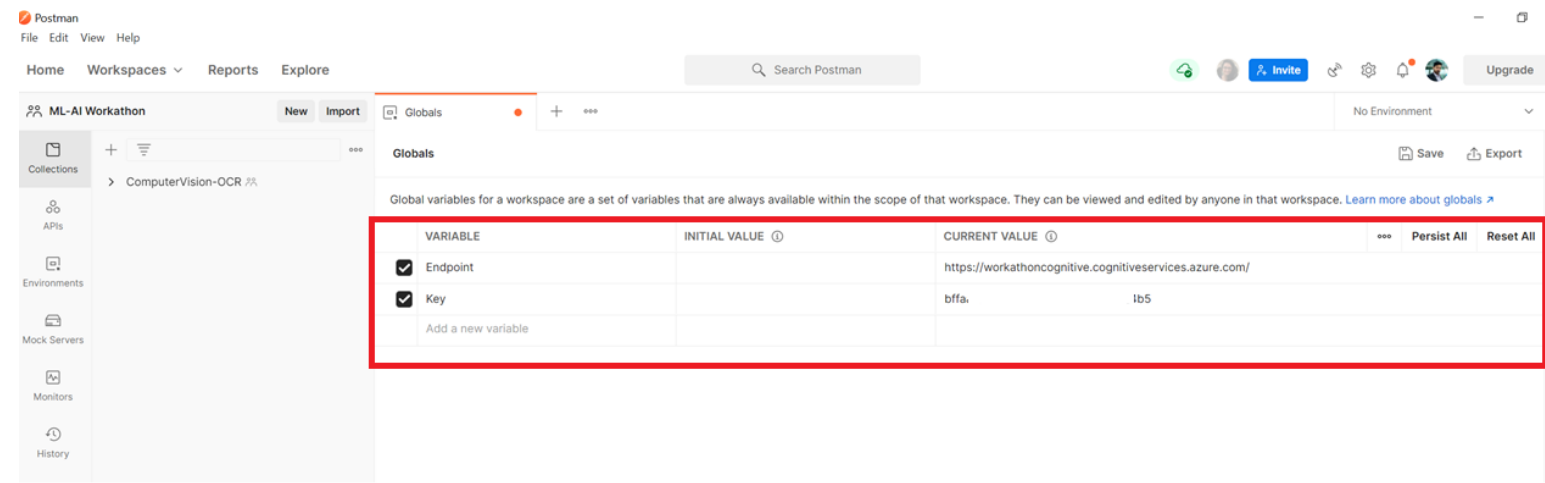
### Configure global variables in Postman

#### Significance :

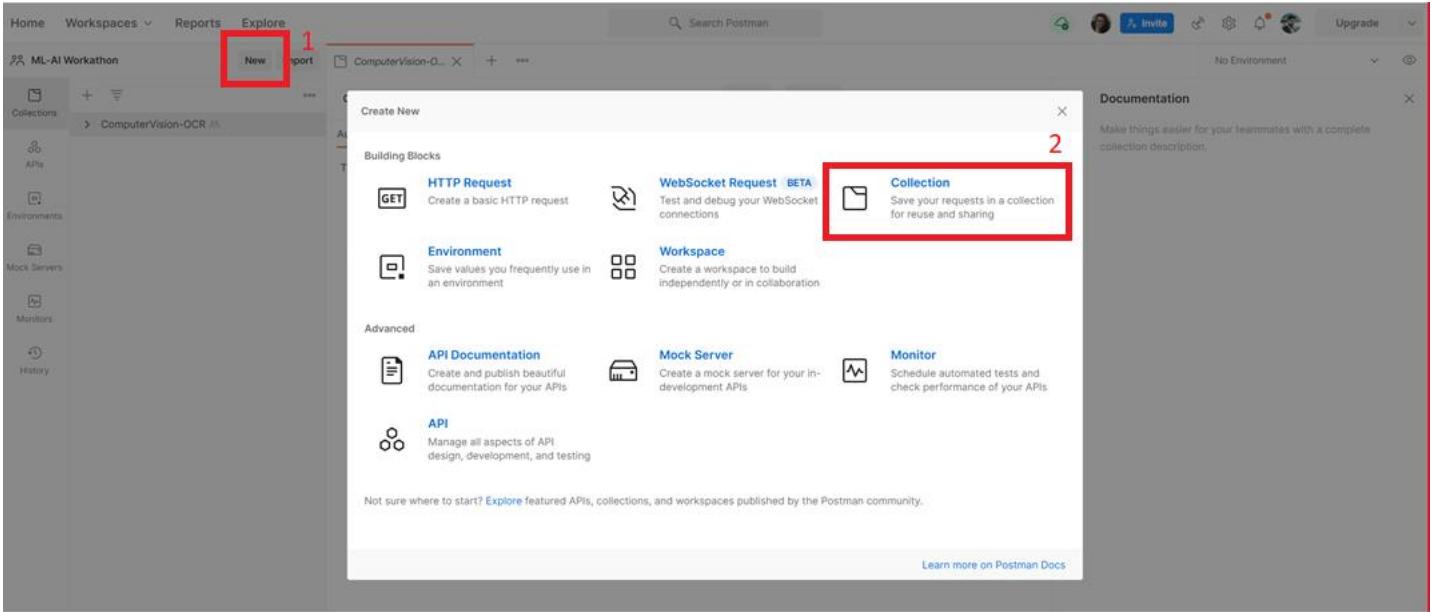
The global variables will be created once and leveraged time & again, in each API request that we make through Postman. This way, you will not have to hard code the Endpoint & Key for every request you make, thereby, making it more secure. This will also save time and effort.

Follow step 1 & 2 to add global variables for :

1. Endpoint – Paste the endpoint of the Multipurpose service account copied earlier
2. Key - Paste the Key of the Multipurpose service account copied earlier



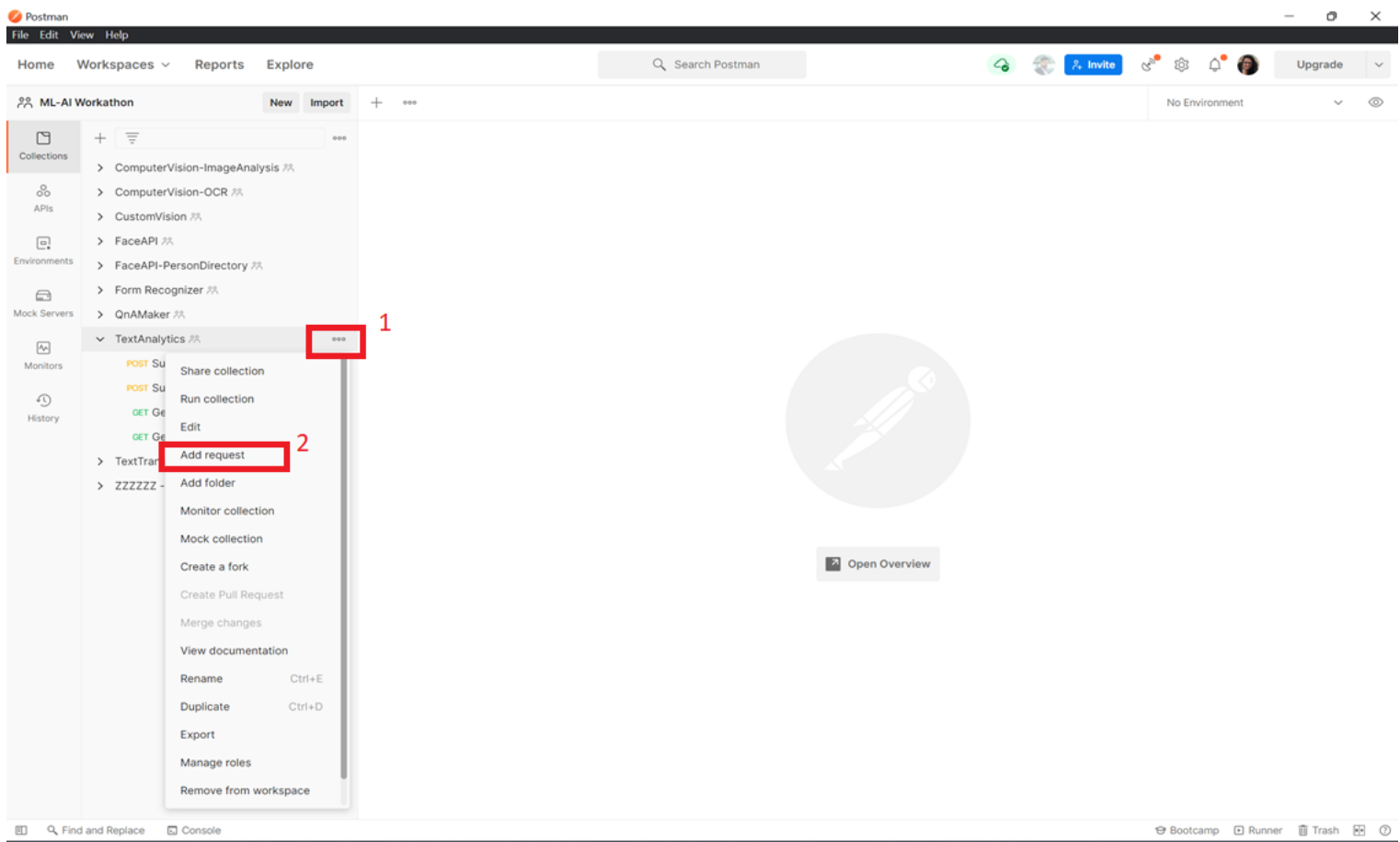
Once you have added the global variables, they will appear this way in your global variables section.



### Create new collection in Postman

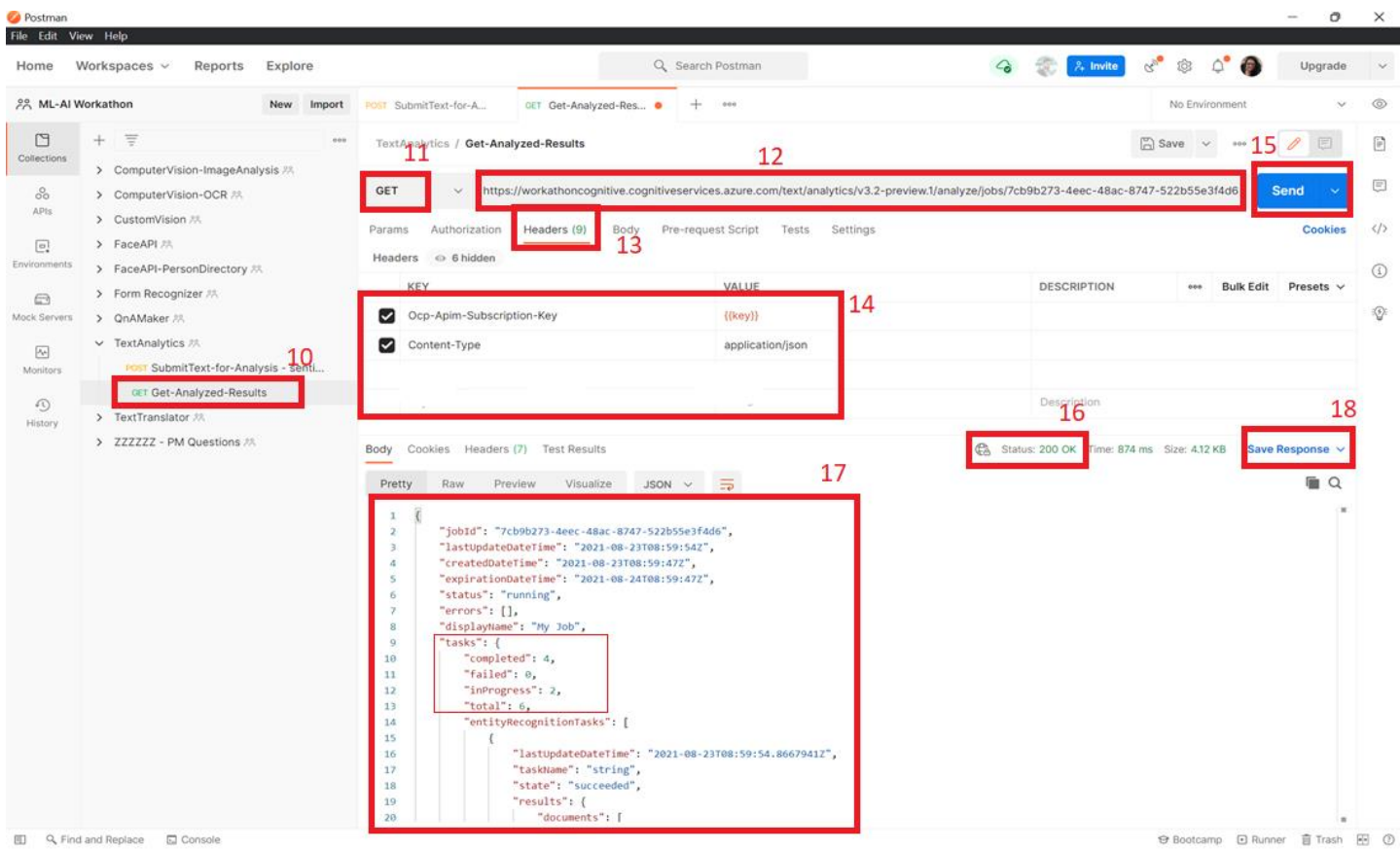
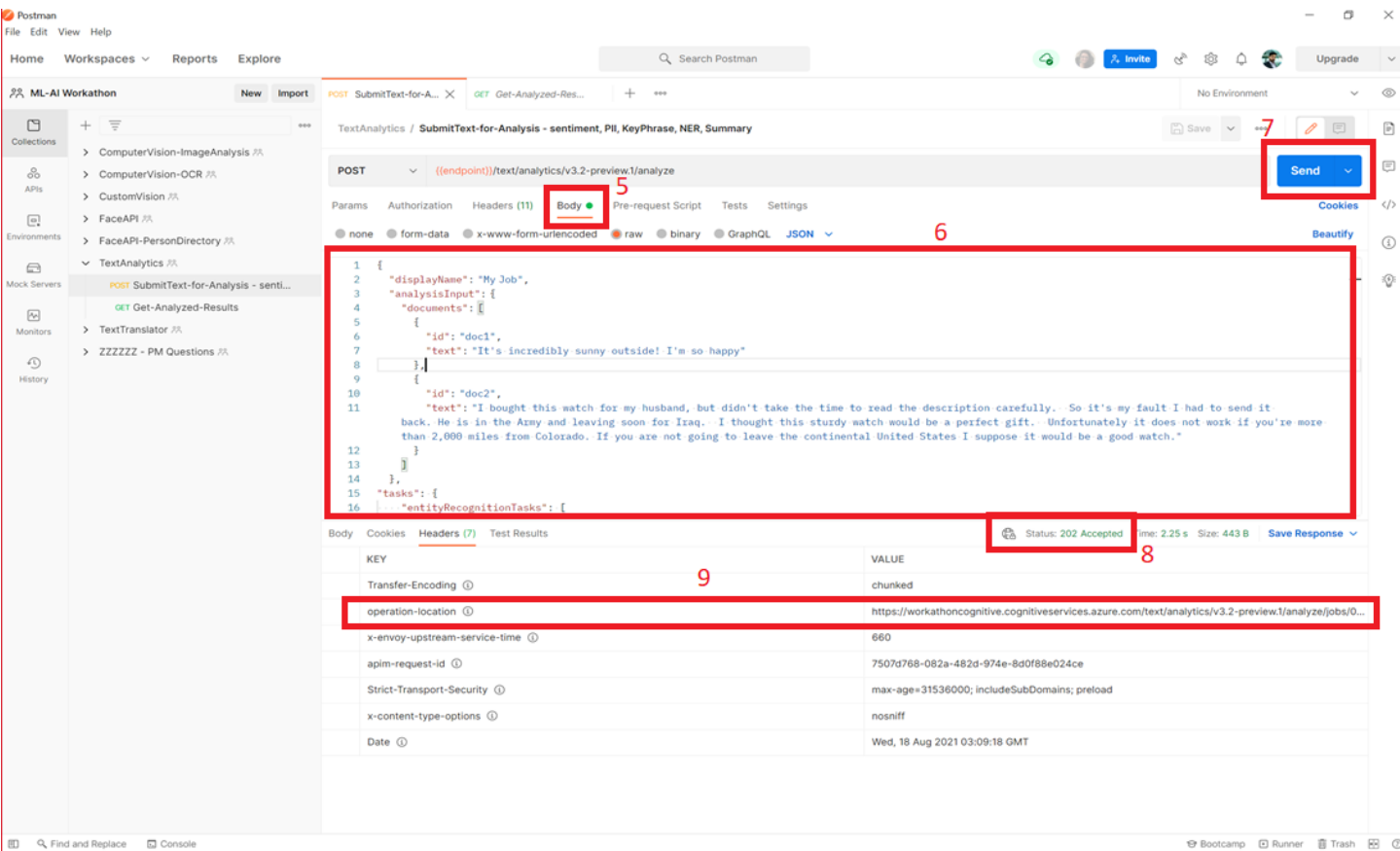
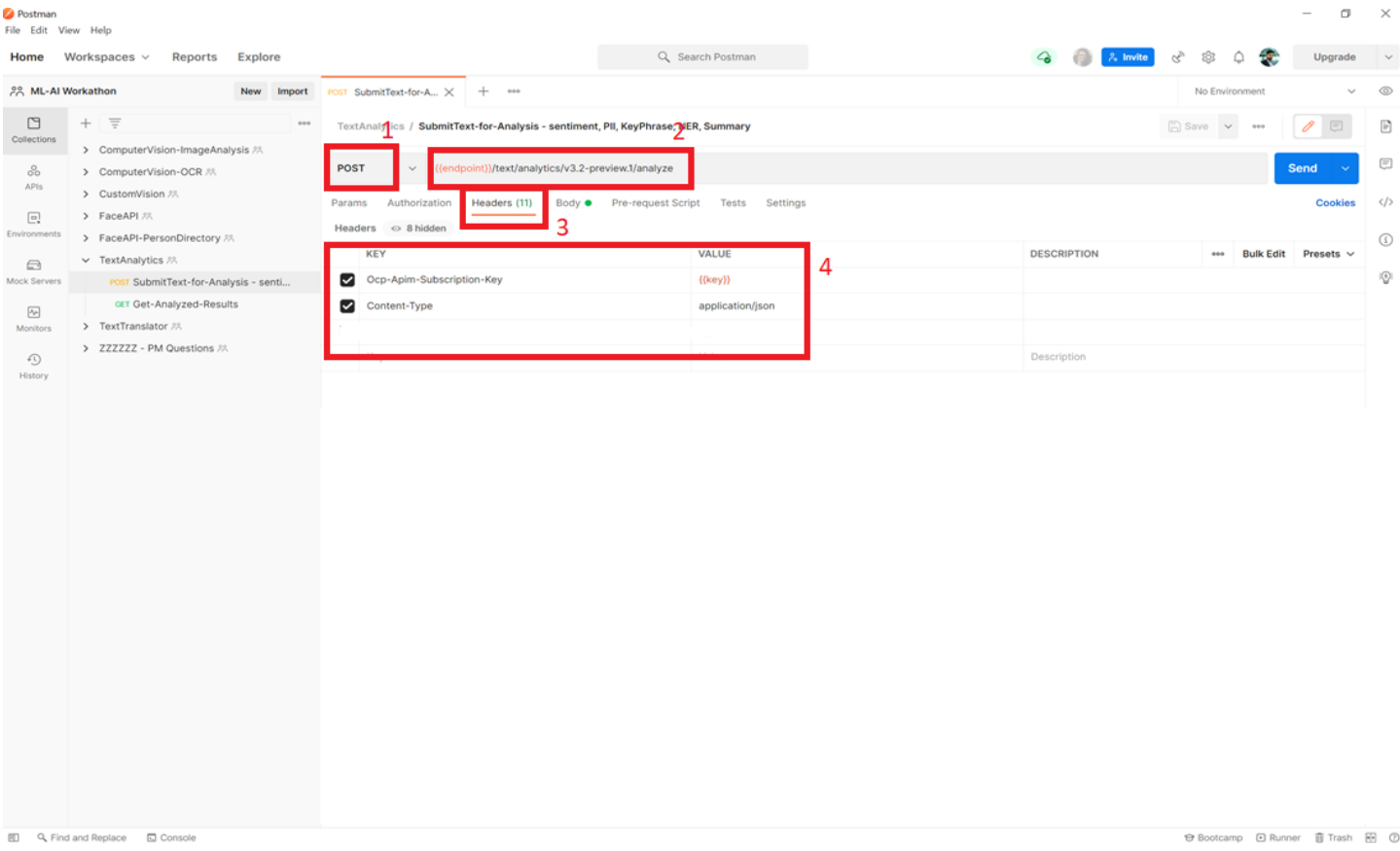
Open Postman > select New.  
On the pop up select Collection.  
Name the collection Text Analytics.

Collection is like a folder for managing the API call requests.



Once you have created the collection, follow steps 1 & 2, to create a new request.





## Text Analytics using analyze API (asynchronous approach)

Using this API we can extract PII, Entities & Linked Entities, Sentiment & Opinion, Key Phrases and Text Summary on input text simultaneously.

This is an async process, hence requires 2 API calls. The first call, as shown in step 2, generates the Operation-Location URL, shown in step 9. The second call is a GET operation to this URL.

### API CALL 1 (POST)

URL 1 : `{{endpoint}}/text/analytics/v3.2-preview.1/analyze`

Headers :

Ocp-Apim-Subscription-Key : `{{key}}`

Content-Type : application/json

Body :

For the content of the Body, use the file 'text analytics analyze api body' from Data folder.

### API CALL 2 (GET)

URL2 : Operation-Location fetched from step 9. Make sure to change the call to GET.

Headers :

Ocp-Apim-Subscription-Key : `{{key}}`

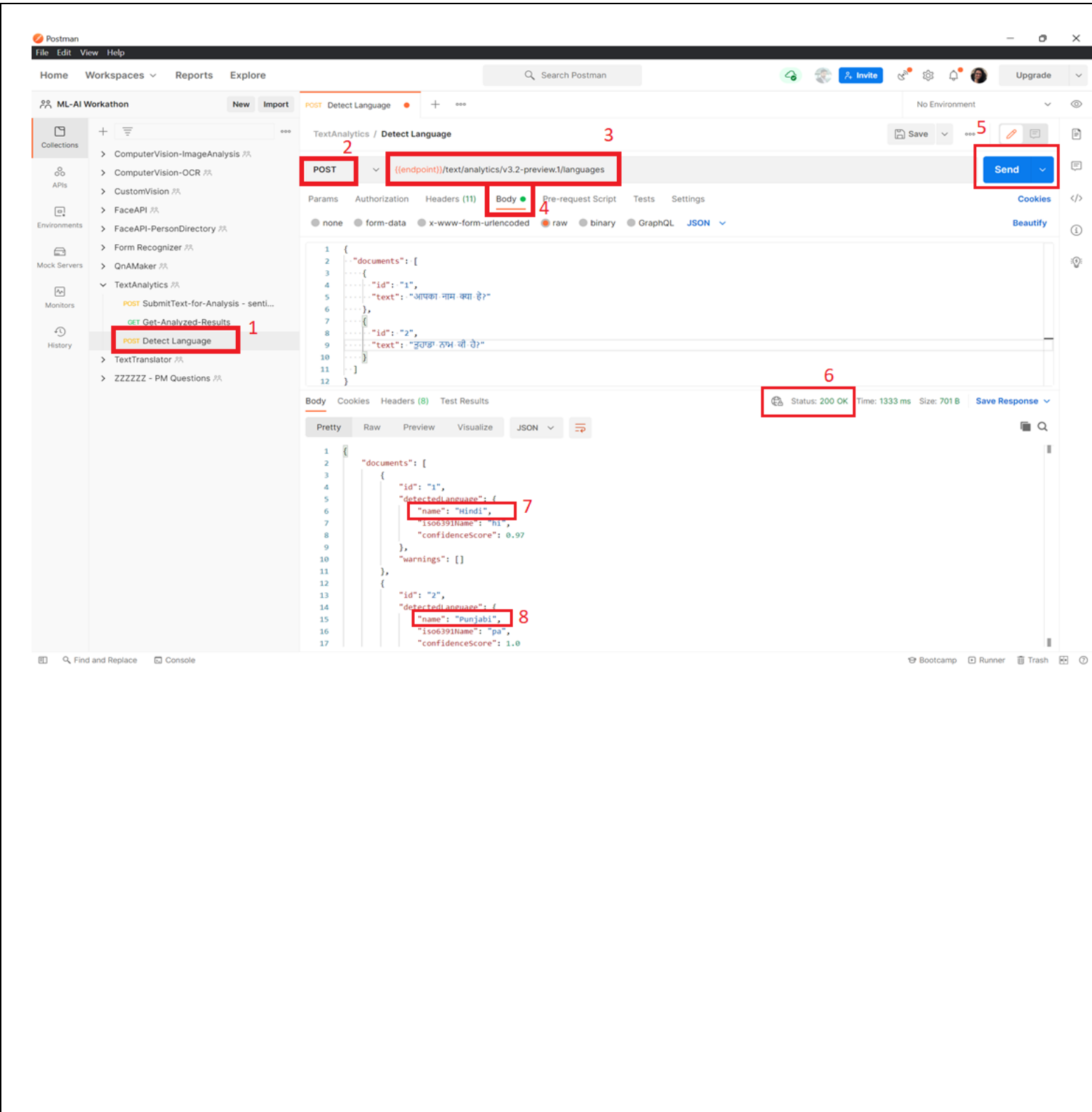
Content-Type : application/json

### Significance of input & output

- `{{endpoint}}` , `{{key}}` : Values being picked from global variables
- Ocp-Apim-Subscription-Key : This is the Azure Cognitive service key, that will authenticate the request.  
Content-Type : This refers to the input type that you provide in the body, for eg application/json allows you to enter body text in JSON format. Change the content-type on the basis of input you provide.
- The input body contains the following key fields :
  - ID : This is a unique ID for each input text you provide.
  - Text : This is the text you want to process. This is always added in raw text format.
  - Tasks : These contain the text analytics tasks you want to perform & their relevant parameters.
- After the 2<sup>nd</sup> API call, you should get status 200 OK as in step 16.

Observe the output received in step 17 for each task performed. You can also download the JSON file for better readability, by using Save Response option on the right corner.

Observe the results by searching for the following key words : `entityRecognitionTasks`, `entityLinkingTasks`, `entityRecognitionPiiTasks`, `extractiveSummarizationTasks`, `keyPhraseExtractionTasks`,



### Detect language API (synchronous approach)

This request upon successful execution will return the language of the input text.

URL : {{endpoint}}/text/analytics/v3.2-preview.1/languages

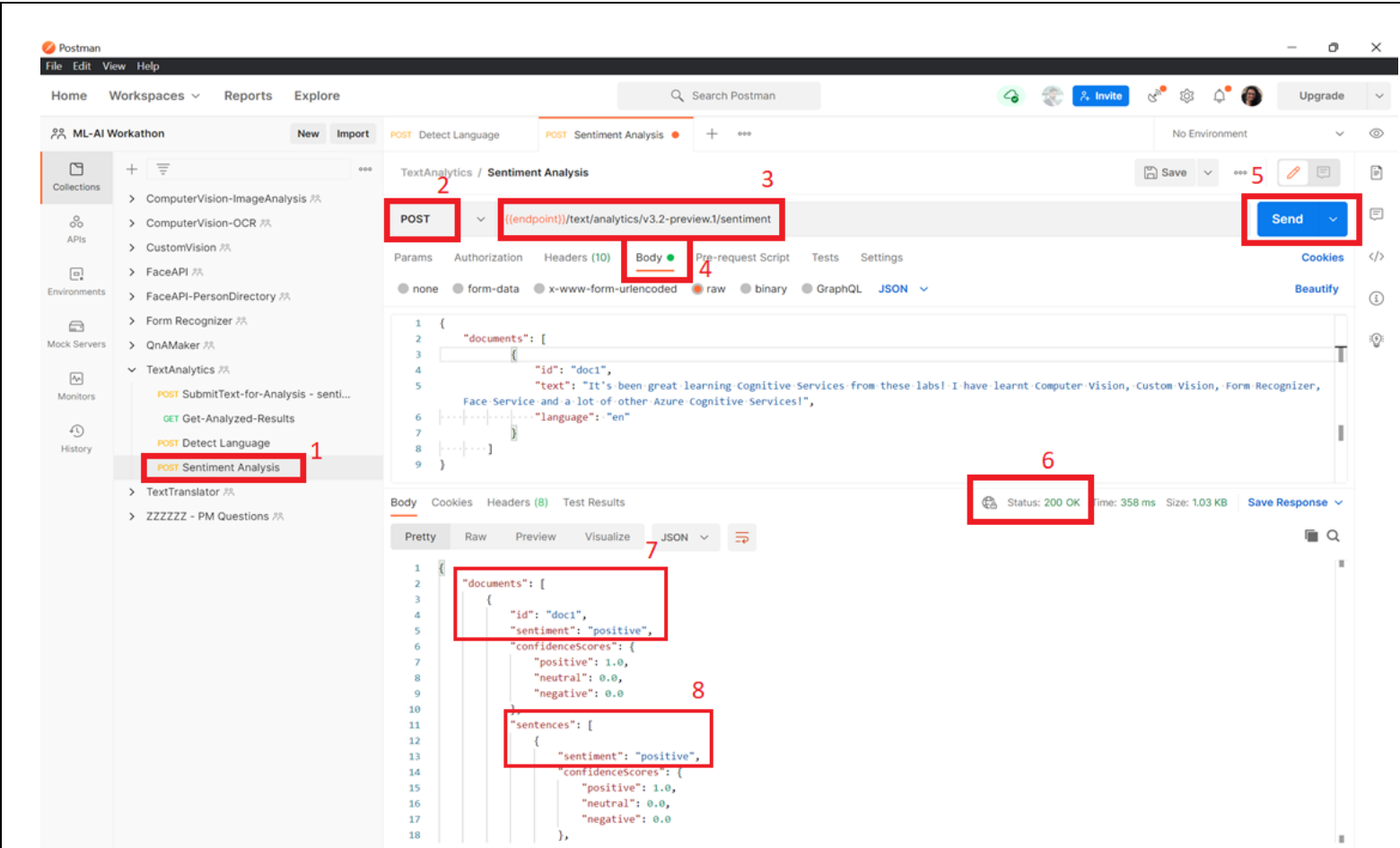
Headers :  
Ocp-Apim-Subscription-Key : {{key}}  
Content-Type : application/json

Body :  
{  
 "documents": [  
 {  
 "id": "1",  
 "text": "आपका नाम क्या है?"  
 },  
 {  
 "id": "2",  
 "text": "ਤੁਹਾਡਾ ਨਾਮ ਕੀ ਹੈ?"  
 }  
 ]  
}

You should also try exploring with different input languages.

### Significance of input & output

1. {{endpoint}} , {{key}} : Values being picked from global variables
2. Ocp-Apim-Subscription-Key : This is the Azure Cognitive service key, that will authenticate the request.  
Content-Type : This refers to the input type that you provide in the body, for eg application/json allows you to enter body text in JSON format. Change the content-type on the basis of input you provide.
3. After you execute the call, observe the status returned, as shown in step 6. This should reflect 200 OK. Observe the detected languages.



### Detect Sentiment API (synchronous approach)

This request upon successful execution will return the sentiment for each individual sentences & for the document as a whole.

URL : `{{endpoint}}/text/analytics/v3.2-preview.1/sentiment?opinionMining=true`

Headers :  
Ocp-Apim-Subscription-Key : `{{key}}`  
Content-Type : application/json

Body :

```
{
  "documents": [
    {
      "id": "doc1",
      "text": "It's been great learning Cognitive Services from these labs!
      I have learnt Computer Vision, Custom Vision, Form Recognizer,Face Service and a lot of
      other Azure Cognitive Services!",
      "language": "en"
    }
  ]
}
```

You should also try exploring with different input languages.

### Significance of input & output

- `{{endpoint}}` , `{{key}}` : Values being picked from global variables
- Ocp-Apim-Subscription-Key : This is the Azure Cognitive service key, that will authenticate the request.  
Content-Type : This refers to the input type that you provide in the body, for eg application/json allows you to enter body text in JSON format. Change the content-type on the basis of input you provide.
- Setting opinionMining parameter to true will also fetch aspect-based sentiment analysis results for key terms.
- After you execute the call, observe the status returned, as shown in step 6. This should reflect 200 OK. Observe the sentiment at sentence & document level. Observe values for **targets** & **assessments** to view Opinion Mining results.

### Homework

- Try out different values for the parameters in /analyze (Asynchronous approach) API body. Try opting out of a couple of features.
- Try out the individual APIs (Synchronous approach) for other features such as Key Phrase Extraction, Entity Recognition etc.

### Additional recommended resources

Service Name	Category	Links
Text Analytics	Programming Language	C#, Java, JavaScript, Python
	Tiers	Free (Not for Production), Standard   ( <a href="#">Differences between Tiers</a> )
	Pricing	<a href="https://azure.microsoft.com/en-in/pricing/details/cognitive-services/text-analytics/">https://azure.microsoft.com/en-in/pricing/details/cognitive-services/text-analytics/</a>
	Limits	<a href="https://docs.microsoft.com/en-us/azure/cognitive-services/text-analytics/concepts/data-limits?tabs=version-3">https://docs.microsoft.com/en-us/azure/cognitive-services/text-analytics/concepts/data-limits?tabs=version-3</a>
	Language Support	<a href="https://docs.microsoft.com/en-us/azure/cognitive-services/text-analytics/language-support?tabs=sentiment-analysis">https://docs.microsoft.com/en-us/azure/cognitive-services/text-analytics/language-support?tabs=sentiment-analysis</a>
	Sample Apps	<a href="#">Text Analytics Library</a>
	Regional Availability & Support	<a href="https://azure.microsoft.com/en-us/global-infrastructure/services/?products=cognitive-services&amp;regions=all">https://azure.microsoft.com/en-us/global-infrastructure/services/?products=cognitive-services&amp;regions=all</a>
	SLAs for Cognitive Services	<a href="https://azure.microsoft.com/en-in/support/legal/sla/cognitive-services/v1_1/">https://azure.microsoft.com/en-in/support/legal/sla/cognitive-services/v1_1/</a>
	Compliance & Certificates	<a href="https://azure.microsoft.com/en-us/support/legal/cognitive-services-compliance-and-privacy/">https://azure.microsoft.com/en-us/support/legal/cognitive-services-compliance-and-privacy/</a>
	Cognitive Services Updates	<a href="https://azure.microsoft.com/en-us/updates/?product=cognitive-services">https://azure.microsoft.com/en-us/updates/?product=cognitive-services</a>

## **Security best practices**

1. [Azure Cognitive Services security](#)
2. [Networking](#)
3. [Authentication](#)
4. [Key Management](#)
5. [Data loss prevention](#)
6. [Azure security baseline](#)
7. [Regulatory Compliance controls](#)

Responsible AI being a part of best practices, we encourage you to read [this](#).

[Text Analytics Documentation](#)

[API & Error references](#)