Northumbria University
NEWCASTLE

Department of Computer and Information Sciences

KV4004 AI Fundamentals

Workshop 5

October 2024

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Explore Computer Vision with Azure AI Services

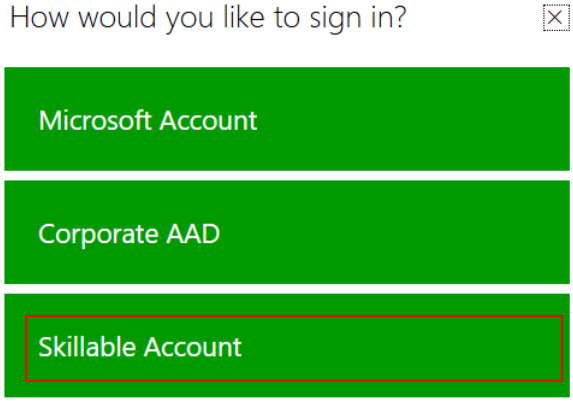
In this workshop, you'll use a simple command-line application to practice Computer Vision in action. Imagine that a retailer Northwind Traders has decided to implement a "smart store", in which AI services monitor the store to identify customers requiring assistance, and direct employees to help them. By using the Computer Vision service, images taken by cameras throughout the store can be analysed to provide meaningful descriptions of what they depict.

> Before proceeding, make sure you have created an Azure Machine Learning workspace and a computing instance.

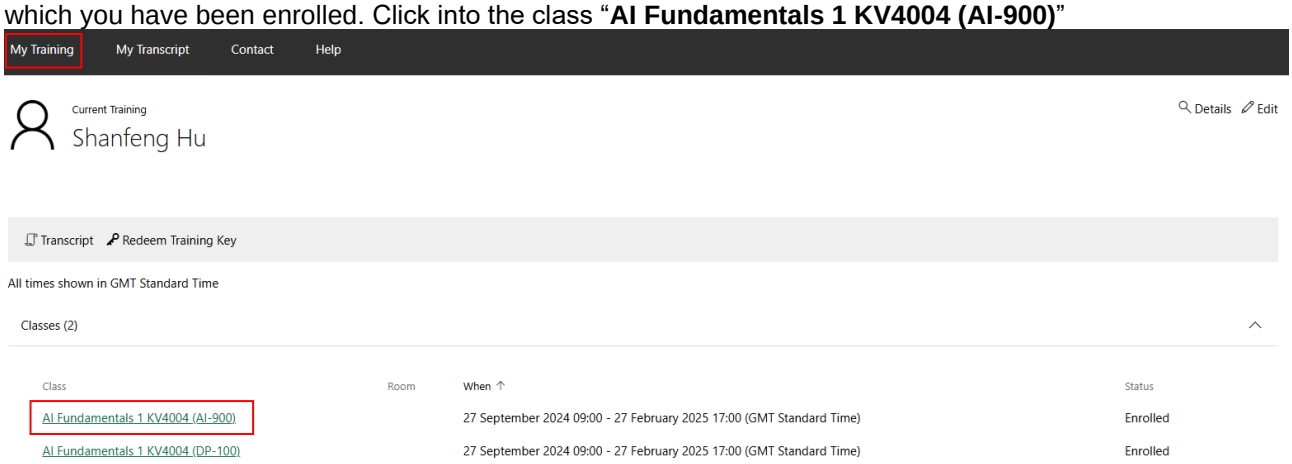
Exercise 1: Create an Azure AI services resource

1. Go to link https://msle.learnondemand.net/ and click on "**Sign In**"

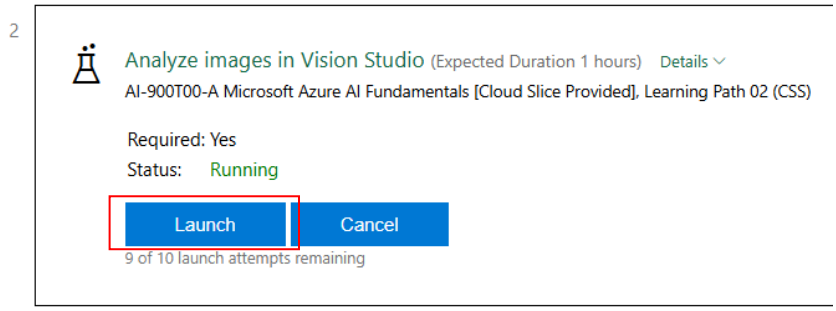
2. Click on "**Skillable Account**" and then provide your username and password on the login page



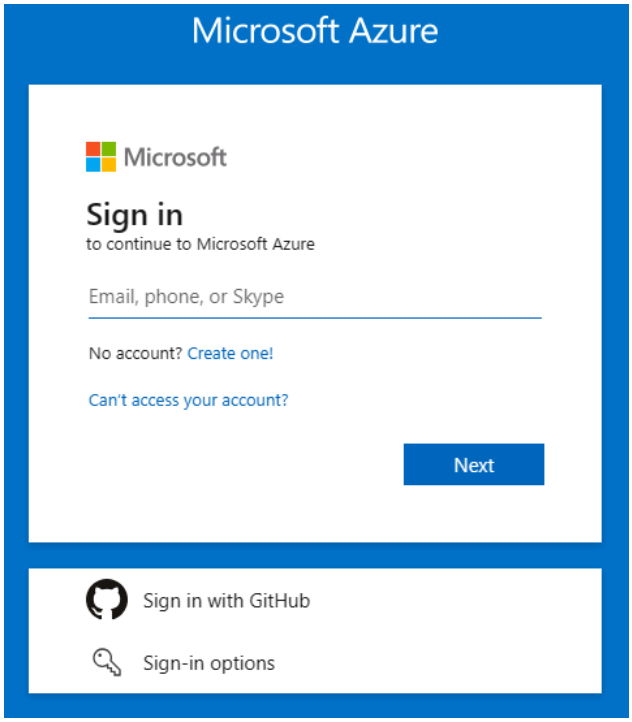
3. Once you are logged in, go to "**My Training**" and click on it, you will then be shown a list of classes on which you have been enrolled. Click into the class "**AI Fundamentals 1 KV4004 (AI-900)**"



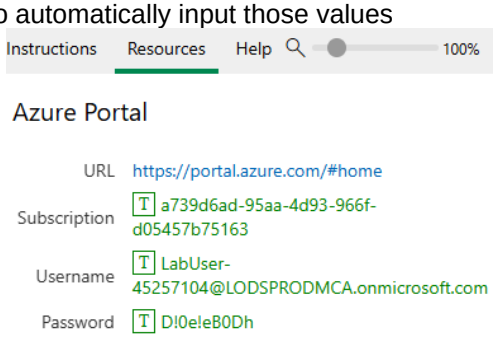
4. In the new page, there are multiple virtual machine options which come with different services provided. Launch the second one "**Analyze images in Vision Studio**"



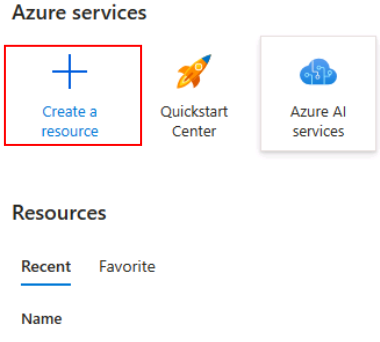
5. Once the virtual machine has been launched, open the Edge browser and navigate to the Azure login in page



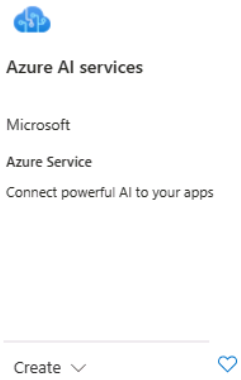
6. Use the username and password provided under the "**Resources**" tab to login. You can simply click on the Username and Password to automatically input those values



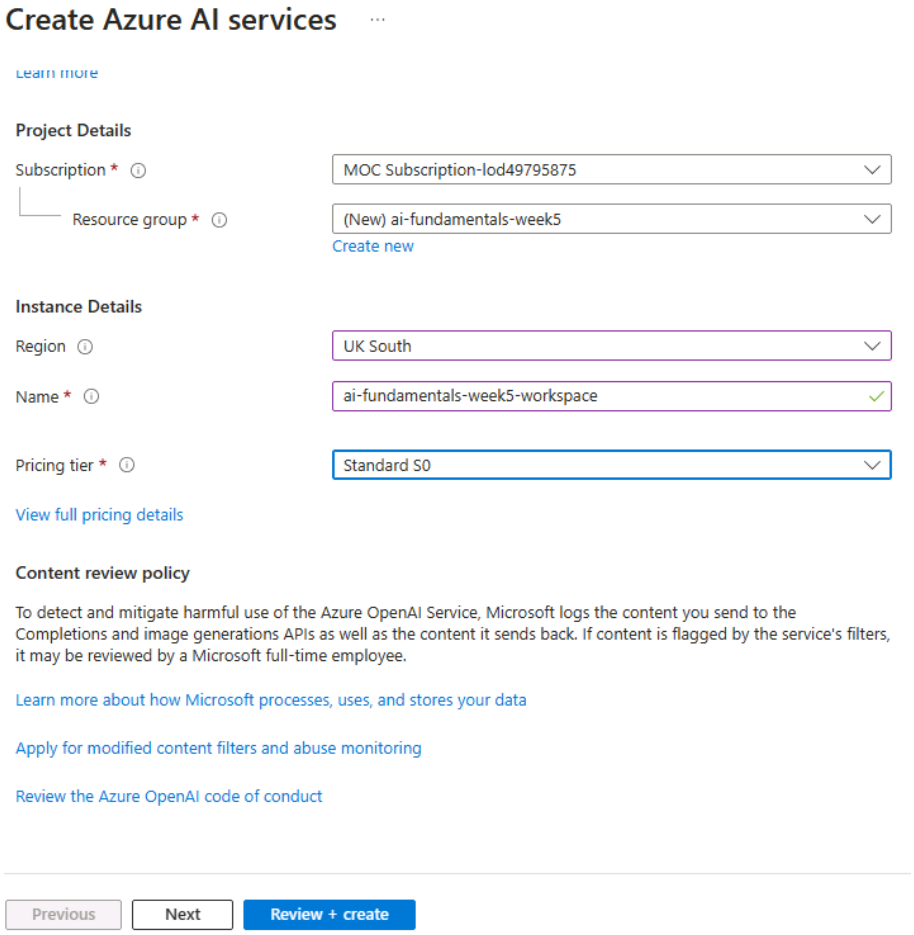
7. After you have logged into Microsoft Azure, go to the top left corner of the landing page and click on "**Create a resource**"



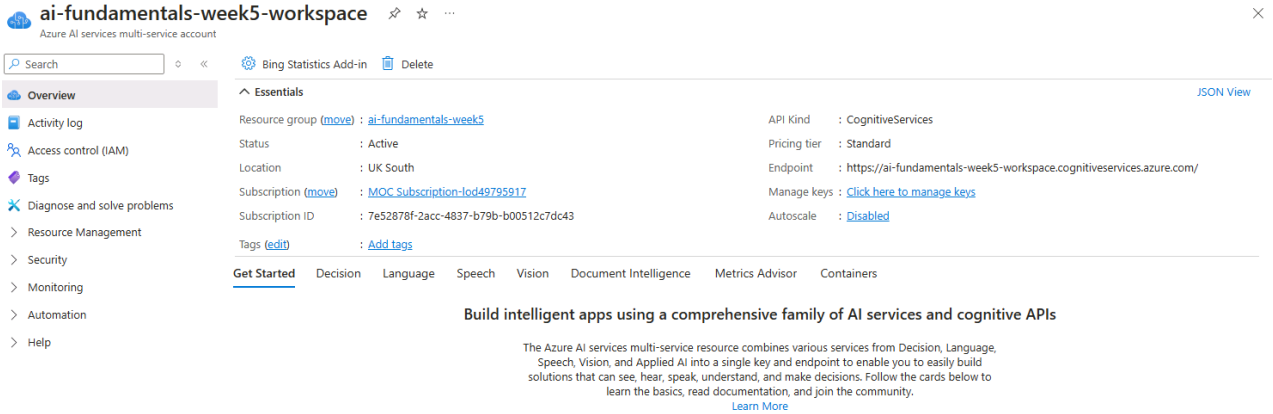
8. In the new page, user the keyword "Azure AI services" to search for this service and then click on it



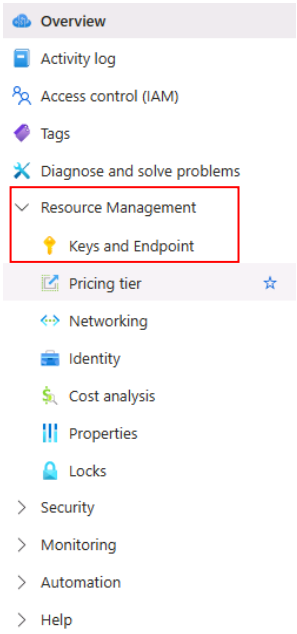
9. When you create the service, use the following details (they are for reference and can be changed as long as the names are valid)



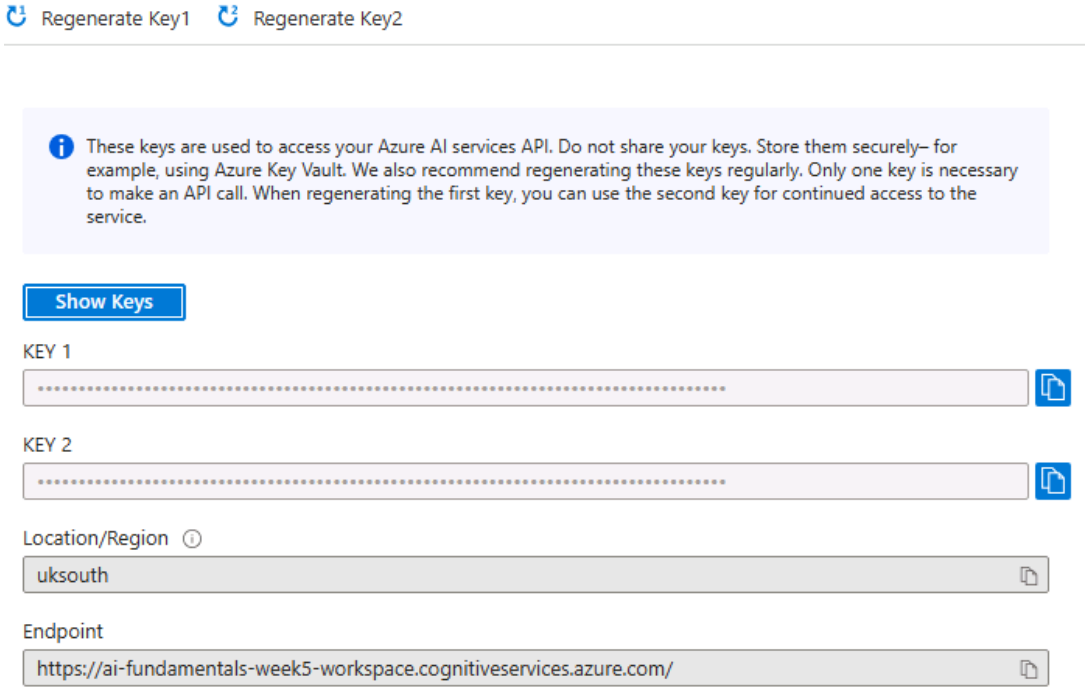
10. Click on "**Review+create**" to create the service and wait for the deployment to be completed



11. On the left panel of the page, click on "**Resource Management**" to expand it and then click on "Keys and Endpoint" the sub menu

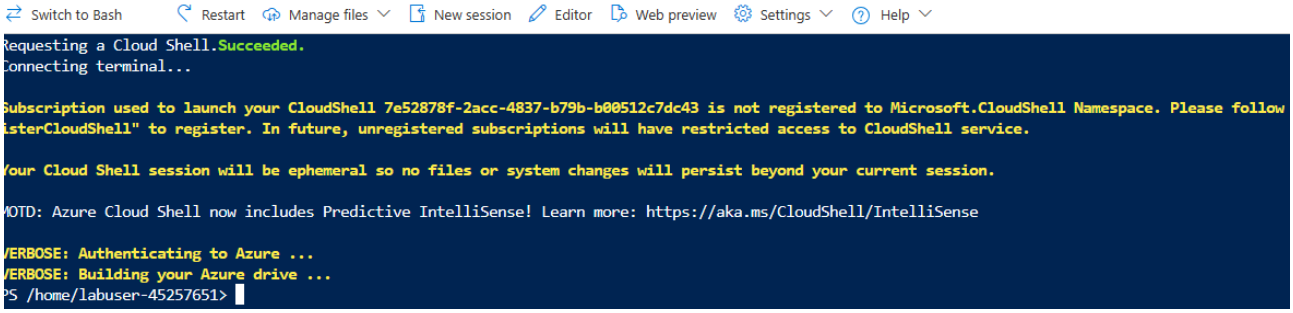


12. On the new page, you will be able to view the keys and endpoint string, which will be needed to run the following task



Exercise 2: Launch Cloud Shell

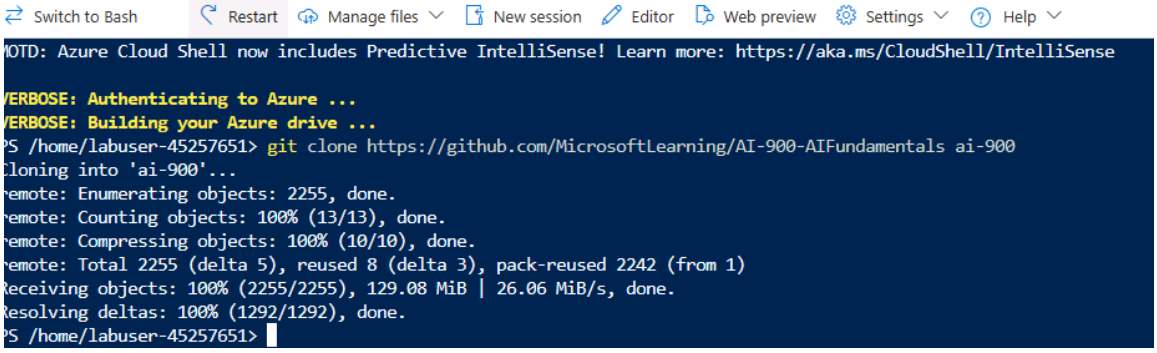
1. Go back to the Azure portal and click on the shell icon at the top right of the page. Once done, you will be able to open a new window within the current page that contains console outputs.



2. Now that you have a Cloud Shell environment, you can run a simple application that uses the Computer Vision service to analyze an image. In the command shell, enter the following command to download the sample application and save it to a folder called ai-900.

```
git clone https://github.com/MicrosoftLearning/AI-900-AIFundamentals ai-900
```

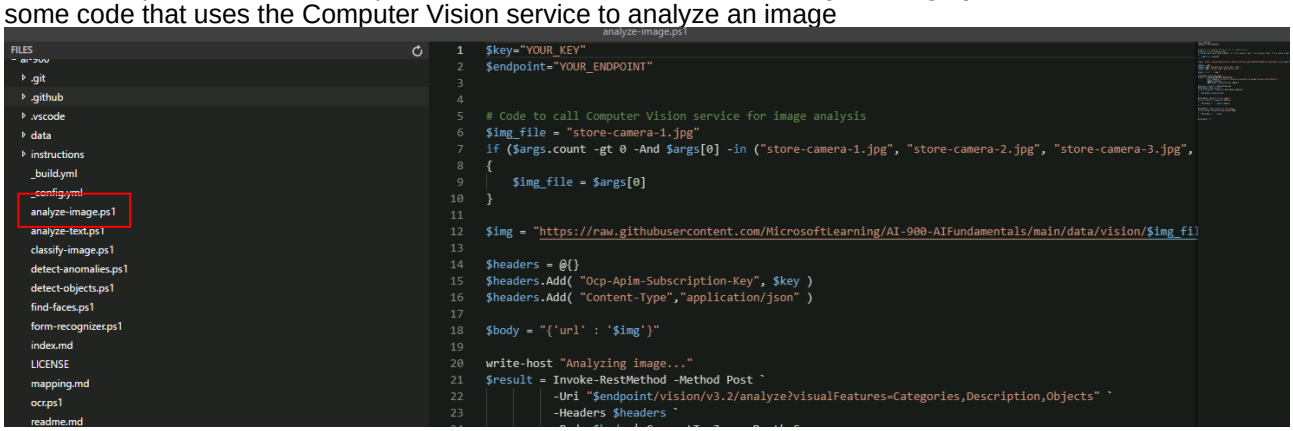
3. Once the application has been downloaded, the content in the shell should look like the following



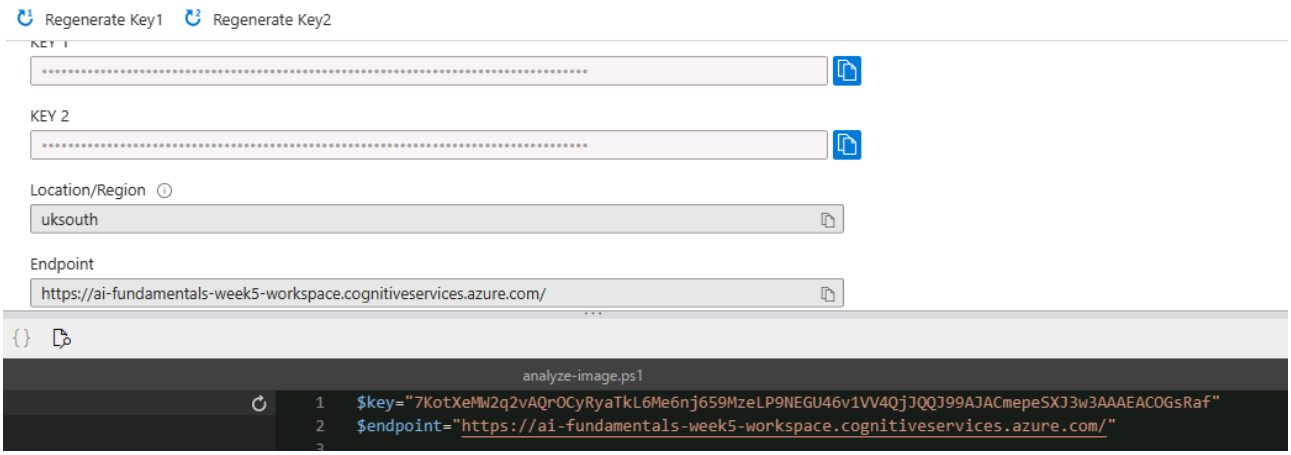
4. Now we want to see all of the files in your Cloud Shell storage and work with them. Type the following command into the shell to launch an editor. You may encounter "**Switch back to the classical shell**" – just click "**Confirm**" to proceed.

```
code .
```

5. In the Files panel on the left, expand the folder **ai-900** and select **analyze-image.ps1**. This file contains some code that uses the Computer Vision service to analyze an image



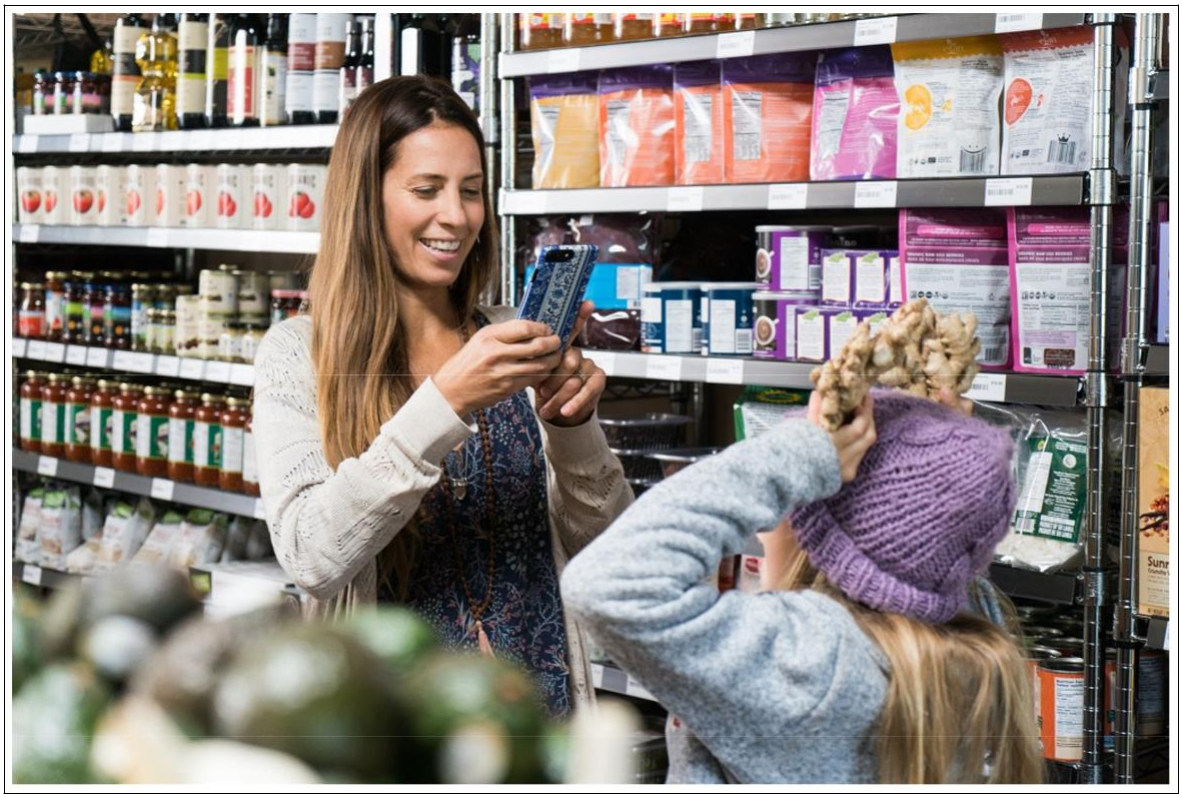
6. Don't worry too much about the code. The important thing is that it needs the endpoint URL and either of the keys for your Azure AI services resource. Copy these from the Keys and Endpoints page for your resource from the Azure portal and paste them into the code editor, replacing the "**YOUR KEY**" and "**YOUR ENDPOINT**" placeholder values respectively.



7. Right click your mouse within the editor and then click on "**Save**" to save your changes.

Exercise 3: Perform Image Analysis

1. Now, let's use our newly created Computer Vision service to analyze the following image, taken by a camera in the Northwind Traders store.



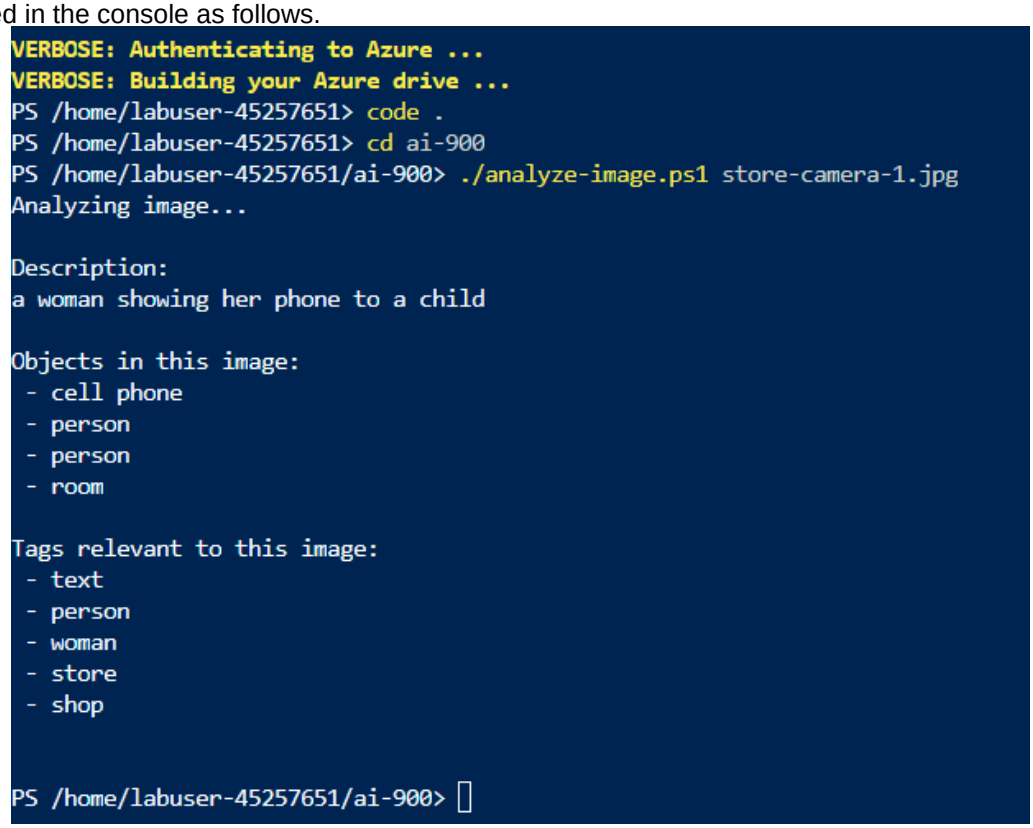
2. In the PowerShell panel, enter the following command to go into our working directory

```
cd ai-900
```

3. Once inside the **ai-900** folder, run the following command to execute the Computer vision service to analyze our first image

```
./analyze-image.ps1 store-camera-1.jpg
```

4. After a short while, the image analysis will be completed, and you will be able to see the results printed in the console as follows.



5. Review the results of the image analysis, which include:
   - A suggested caption that describes the image
   - A list of objects identified in the image
   - A list of tags that are relevant to the image
6. Let's try the second image. This time, we should be using a different image name as in **./analyze-image.ps1 store-camera-2.jpg**. The application we are launching here is the same as for the first image

7. The result will look like the following – have an examination of it!

```
PS /home/labuser-45257651/ai-900> ./analyze-image.ps1 store-camera-2.jpg
Analyzing image...

Description:
a woman holding a shopping cart in a grocery store

Objects in this image:
 - person

Tags relevant to this image:
 - text
 - person
 - woman
 - marketplace
 - shop


PS /home/labuser-45257651/ai-900>
```