

# Lab Watson Visual Recognition - Introduction

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Watson Visual Recognition understands an image's content out-of-the-box. The pre-trained models enable you to analyze images for objects, faces, colors, food, explicit content and other subjects for insights into your visual content.

Watson can also learn any new object, person, or attribute.

With only a few images, the computer vision service can learn any new object, person, or attribute such as identifying car type and damage to estimate repair costs. Train models effortlessly with Watson Studio — a free workspace where you can seamlessly create, evaluate, and manage your custom models.

In this lab, you go through a step-by-step process to use Watson Visual Recognition and create your own custom model using the integrated tooling available on IBM Cloud.

## Objective

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In the following lab, you will learn:

- How to use the Watson Studio tools to create your own custom model with Watson Visual Recognition

## Pre-Requisites

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- Get an [IBM Cloud Platform account](#) in the US region, or use an existing account.

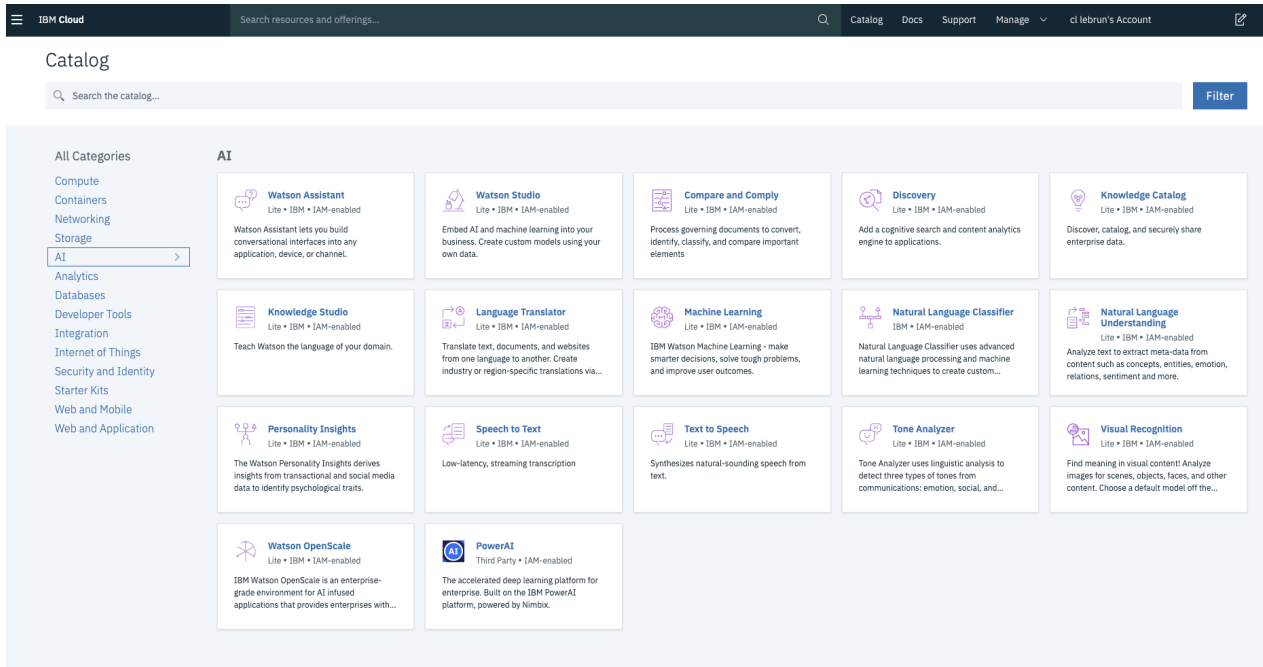
## Steps

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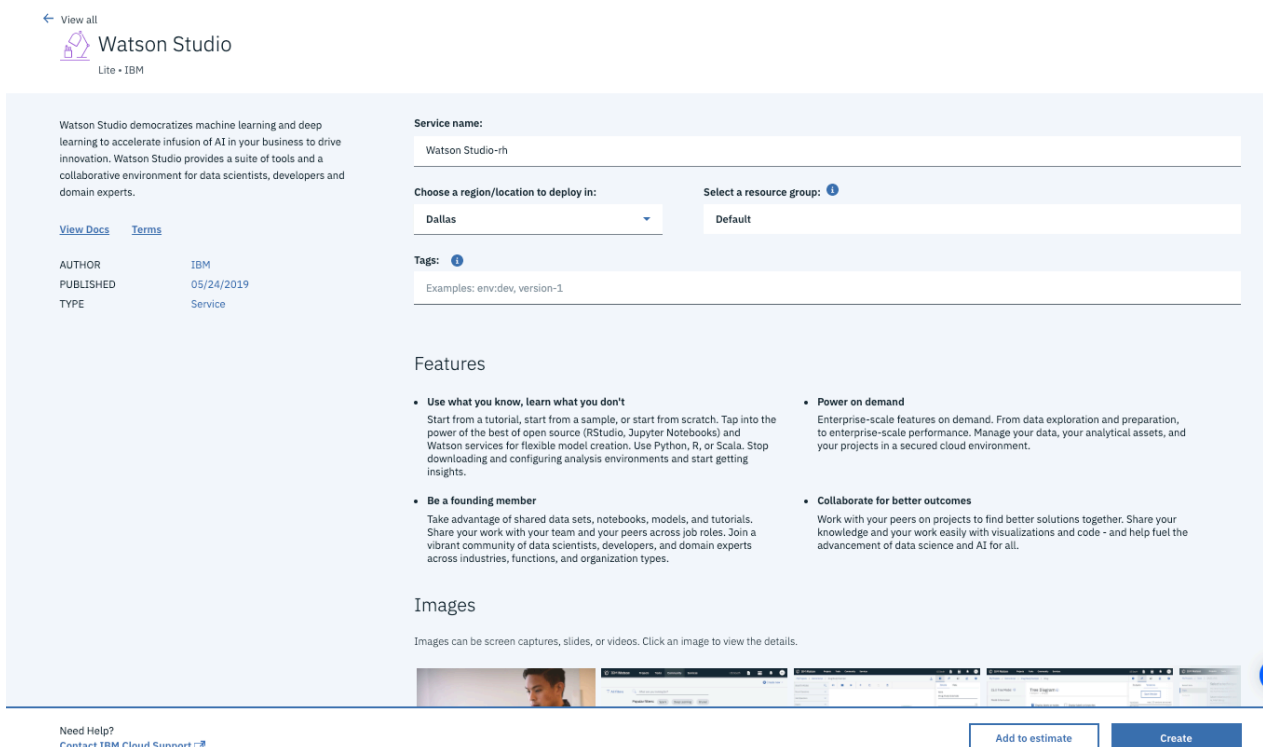
1. Creating a custom classifier with Watson Visual Recognition
2. Test the Watson Visual Recognition model
3. Watson Visual Recognition APIs

# Step 1 - Creating a custom classifier with Watson Visual Recognition

1. Login to IBM Cloud. <https://cloud.ibm.com/login>
2. Go to the IBM Cloud **Catalog** and select AI category.

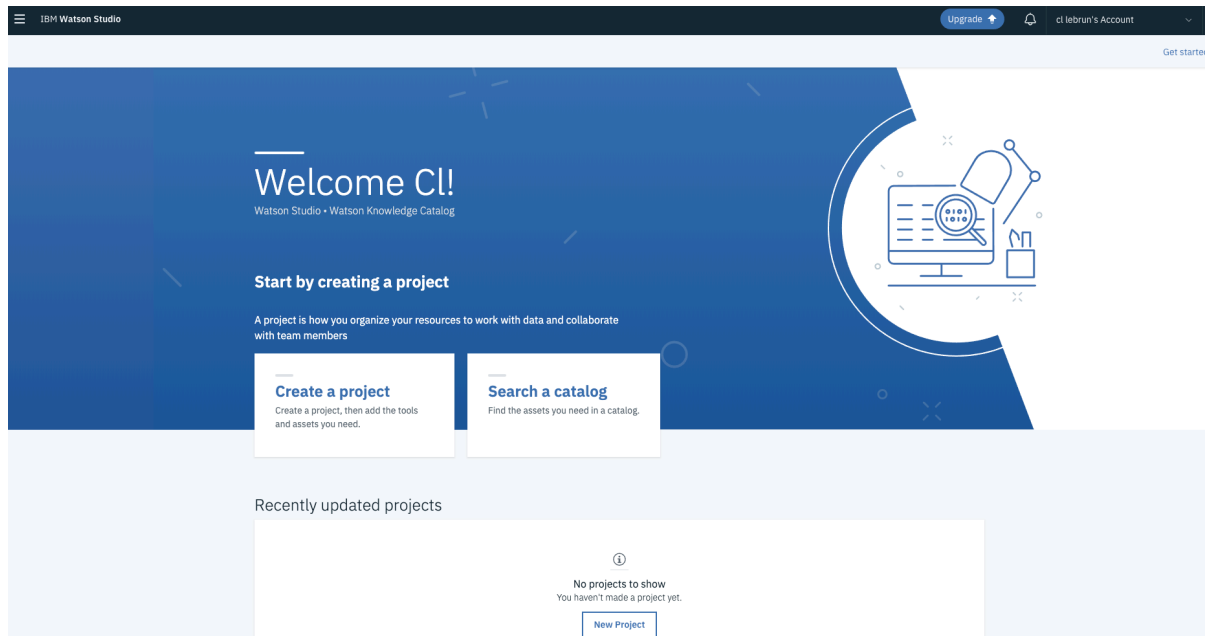


3. Then click the **Watson Studio** tile, then choose a name for your service, in the **DALLAS** region, then click the Create button.

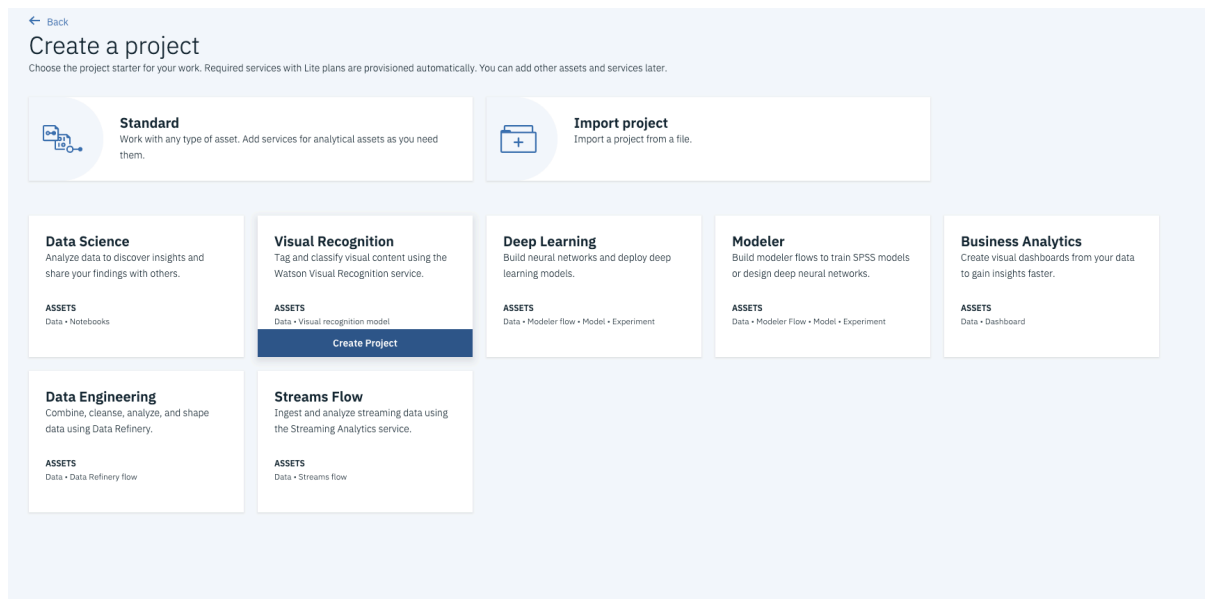


Watson Studio is the tool for building AI models in a collaborative fashion so you can provide a more democratic training process that reduces AI biases.

4. Click the Get Started button to open Watson Studio.
5. Click the Get Started button when prompt.
6. Click **Create a project**.



7. Select **Visual Recognition** type of project.



8. Select a resource group if needed.
9. Select the **US South** region for Visual Recognition.

## Select a region for Visual Recognition

Select an IBM Cloud [region](#) to create this service in.

If an [instance already exists in the selected region](#), an additional service will not be provisioned.

US South

Select

10. Enter a name for your project (e.g. The Simpsons project) and a description if you like then click the **Create** button. This project will create the needed Cloud Object Storage and a Watson Visual Recognition service or you can select one of your choice if you already have some instances created.

### New project

Create a project for your custom model. A project is how you organize your resources to work with data and share assets with collaborators.

#### Define project details

**Name**

The Simpsons project

**Description**

Project description

#### Choose project options

☒ Restrict who can be a collaborator ⓘ

Project will include integration with [Cloud Object Storage](#) for storing project assets and [Watson Visual Recognition](#) for model training and deployment.

Additional tools and services can be added in Project Settings after project creation.

#### Storage

cloud-object-storage-dsx

#### Watson Visual Recognition

watson-vision-combined-dsx

Cancel

Create

Great! You have created a new machine learning project that you can collaborate on with others, upload data-sets, and create training models. Additionally, this project wizard has instantiated the Watson Visual Recognition service that is pre-trained on millions of consumer oriented images and can be used with no additional training (as we'll see below).

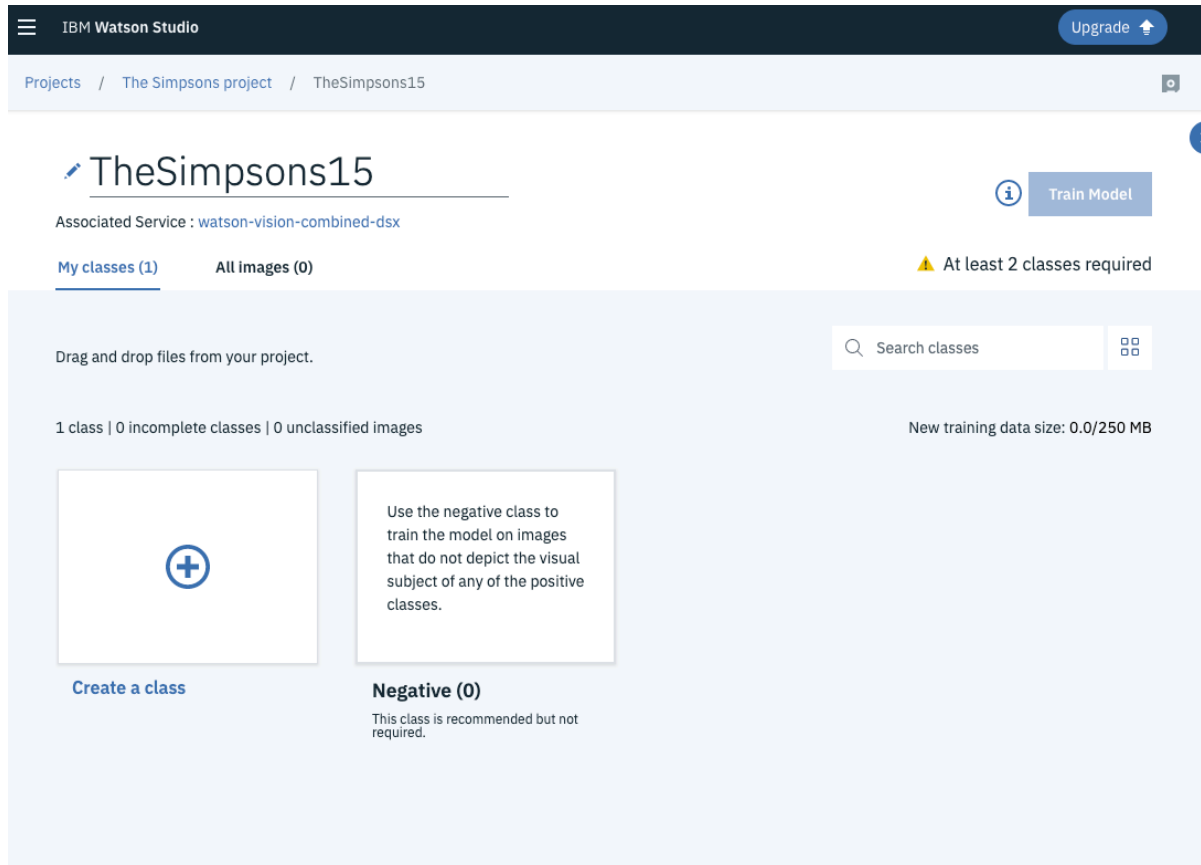
However, since consumer data represents only 20% of the world's data, we will create a custom model below to teach Watson your business and what insights are in your images that consumer trained visual recognition software just doesn't cover.

Objectives : Teaching Watson New Tricks

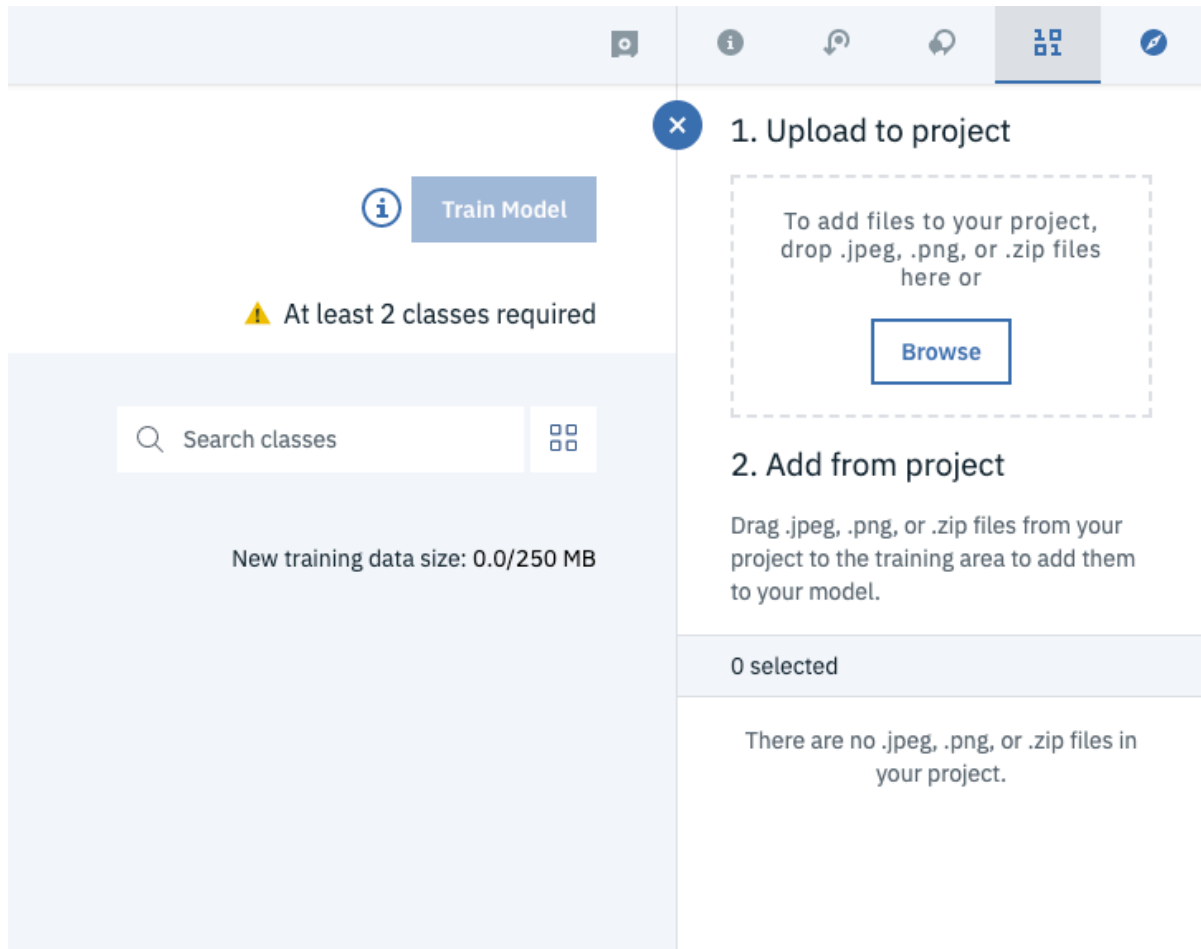
The Visual Recognition service is trained by providing example images for each classification bucket -- the more examples you provide, the better the accuracy. After Watson has trained itself on your images, then it will classify a new image that it has never seen before and calculate how confident it is that it belongs to one of your classification types.

### Train your custom model:

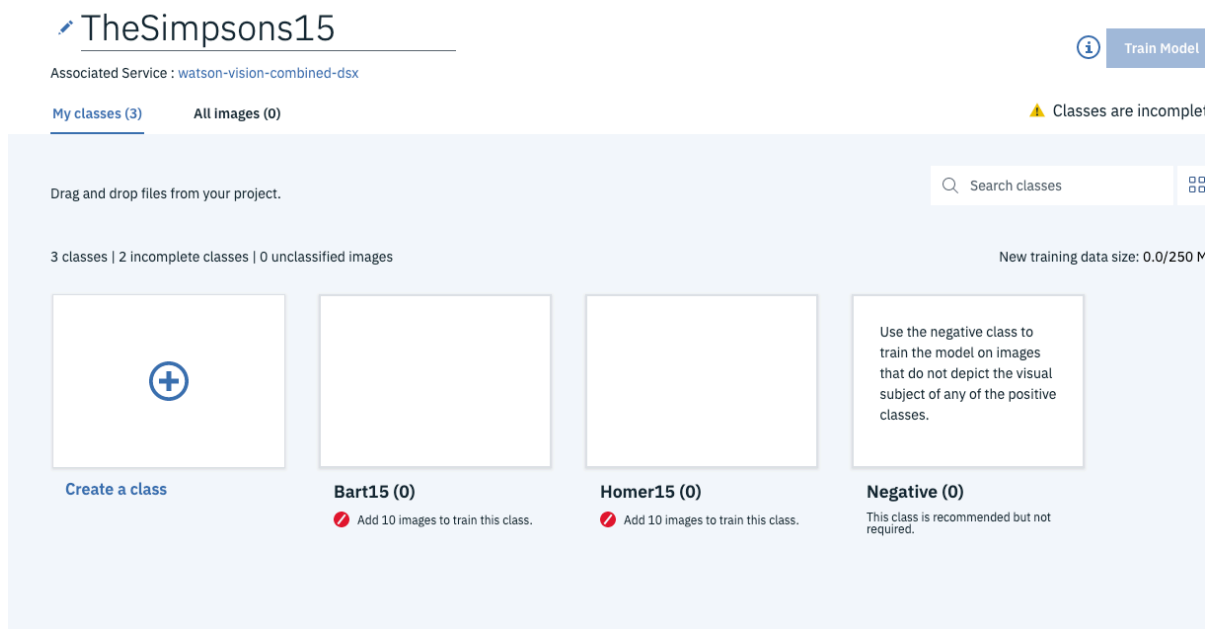
11. Rename your model "Default Custom Model" by "TheSimpsons15"



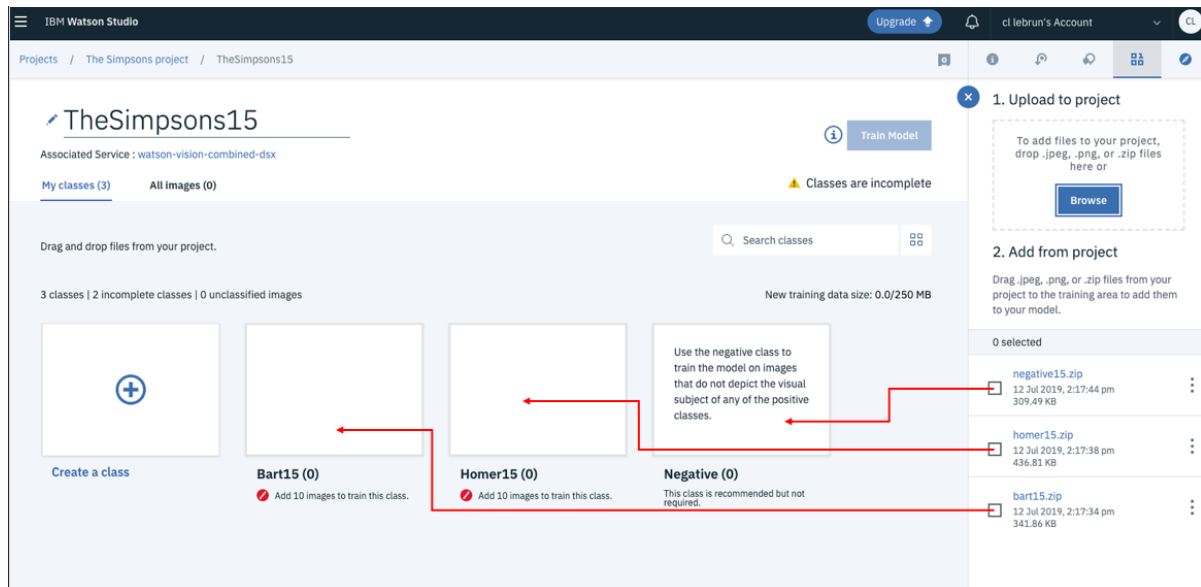
12. You will now load images create your model classes. The pane to manage file upload is shown on the right side of your screen. Click the **Browse** button to upload a zip file containing at least 10 photos (.jpg or .png) for Homer images, at least 10 photos for Bart images, and 10 photos for never Homer or Bart characters. You can download zip files from the folder [TheSimpsons15 - Training Set](#)



13. Create 2 classes by clicking on the + sign : Homer15 and Bart15



14. Then drag the "Homer15.zip" data set from the right of the screen to the Homer15 class card. Upon completion you will see image thumbnails for the class displayed in the tile. Then drag and drop the "Bart15.zip" data set to the Bart15 class card. Drop the "negative15.zip" data set classifier to the Negative (recommended) card to specify images which are not from the defined classes.



15. Your model is ready to train, you can now click on the **Train Model** button and for your model to be trained. Even though it might seem like Watson is taking a long time, Watson set a world record for the fastest training of 7.5 million images in 7 hours versus the previous record taking 10 days (i.e. 34 times faster): <http://fortune.com/2017/08/08/ibm-deep-learning-breakthrough/>

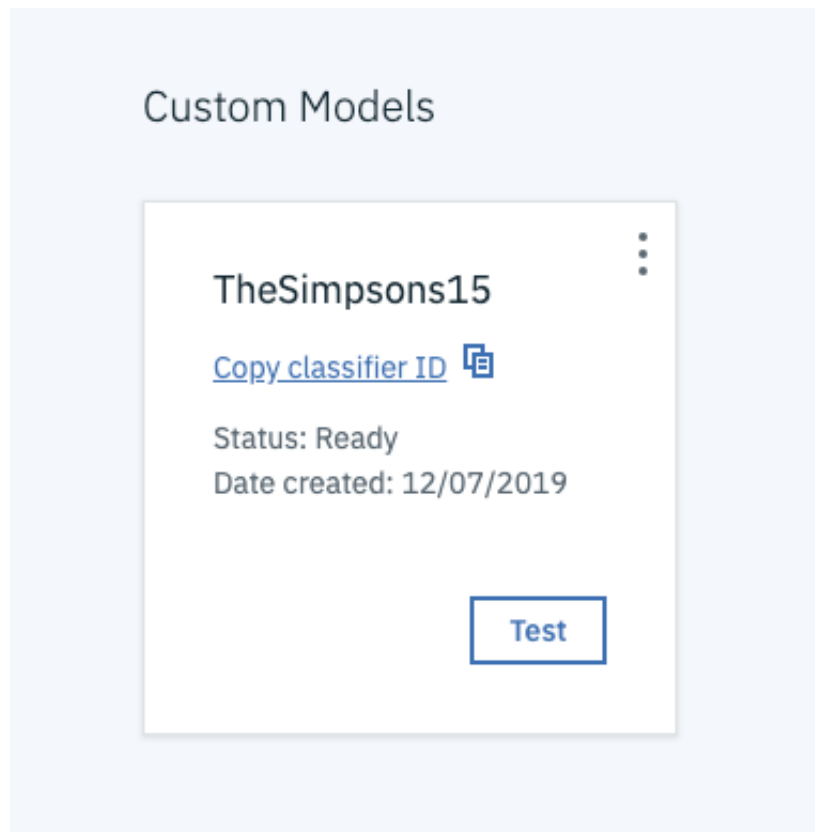
It may take approximatively 8 minutes to be ready.

This is really powerful! You can train Watson so it recognizes what you want, even if the most obvious object in a picture isn't what you want. Let's say you are in the tire business; most image recognition software (Watson included) will recognize an automobile image instead of the tires that you care about. Building your custom model will allow you to create a domain specific image recognition service.

## Step 2 - Test the Watson Visual Recognition model

Now that Watson has been trained on your specific images, let's test it out using the toolkit.

1. Click the Visual Recognition service name associated to your project (under your model name) link to return to the Visual Recognition service and scroll down until you see your newly trained TheSimpsons15 model.
2. Click the Test button, which will take you to your Overview tab showing you information about this model.



- Click the Test tab and drop some test images onto the canvas to see how your custom model performs. Tip: you'll find a folder named [TheSimpsons15 - Test Set](#) that contains some test images you can use; or find some from your favourite search engine.

IBM Watson Studio

Projects / The Simpsons project / TheSimpsons15

TheSimpsons15

Associated Service : watson-vision-combined-dsx

Overview **Test** Implementation

Filter

Threshold 0.0

Class

☐ Bart15

☐ Homer15

|  |                             |  |                             |  |                             |  |                             |
|--|-----------------------------|--|-----------------------------|--|-----------------------------|--|-----------------------------|
|  | Bart15 0.65<br>Homer15 0.47 |  | Homer15 0.76<br>Bart15 0.39 |  | Bart15 0.78<br>Homer15 0.23 |  | Bart15 0.77<br>Homer15 0.20 |
|  | Homer15 0.85<br>Bart15 0.16 |  | Homer15 0.88<br>Bart15 0.00 |  | Homer15 0.88<br>Bart15 0.11 |  | Homer15 0.83<br>Bart15 0.28 |
|  |                             |  |                             |  |                             |  |                             |

## Step 3 - Watson Visual Recognition APIs



## Using Visual Recognition APIs with command line

You can test also the cURL commands to call your Visual Recognition service and classify images against your model.

1. Click on the implementation tab, the steps to call your API with the cURL commands are described:

The screenshot shows the 'Implementation' tab for a model named 'TheSimpsons15'. The 'Code Snippets' sidebar on the left lists various languages: cURL, Java, Node, Python, Ruby, and Core ML. The main content area provides instructions and code snippets for calling the API. It includes the API endpoint, authentication details, and two methods for classifying an image: GET and POST. The POST method includes a sample cURL command with placeholders for the API key and image file.

**TheSimpsons15**  
Associated Service : watson-vision-combined-dsx Edit and Retrain

**Implementation**

Use the code snippets below to classify images against your model. For reference, the full API specification is available [here](#).

**API endpoint**

```
https://gateway.watsonplatform.net/visual-recognition/api
```

**Authentication**

```
curl -u "apikey:{apikey}" "https://gateway.watsonplatform.net/visual-recognition/api/v3/{method}"
```

**Classify an image (GET)**

```
curl -u "apikey:{apikey}" "https://gateway.watsonplatform.net/visual-recognition/api/v3/classify?url=https://watson-developer-cloud.github.io/doc-tutorial-downloads/visual-recognition/fruitbowl.jpg&version=2018-03-19&classifier_id=TheSimpsons15_318353736"
```

**Classify an image (POST)**

```
curl -X POST -u "apikey:{apikey}" -F "images_file=@fruitbowl.jpg" -F "threshold=0.6" -F "classifier_id=TheSimpsons15_318353736" "https://gateway.watsonplatform.net/visual-recognition/api/v3/classify?version=2018-03-19"
```

2. To get your service API Key, click on your service name under the model name.
3. Your API Key is available on the **Credentials** tab, copy/paste it in local file on your laptop:

The screenshot shows the 'Credentials' tab for the 'Visual Recognition : watson-vision-combined-dsx' service. It displays a table of service credentials. The table has two columns: 'Key name' and 'Date created'. One credential is listed with the key name 'wdp-writer' and a creation date of '2019-07-12T11:37:32.654683962Z'. Below the table, there is a placeholder for the API key, represented by a curly brace '{'.

IBM Watson Studio

Services / Watson Services / watson-vision-combined-dsx

**Visual Recognition : watson-vision-combined-dsx**  
Associated project : The Simpsons project

**Credentials**

**Service Credentials**

| Key name     | Date created                   |
|--------------|--------------------------------|
| ✉ wdp-writer | 2019-07-12T11:37:32.654683962Z |

{

4. In a terminal window replacing with your own API Key, you can test it with the provided image or an image of your choice found on the web

## Integrate with your apps

On the implementation tab, you also have access to several code snippets (Java, Node, Python, Ruby).

SDKs are available.

You can also use Core ML in your iOS apps. You can download a Core ML model file (.mlmodel) of a custom classifier. This allows you to use your custom Visual Recognition model in an offline mode.