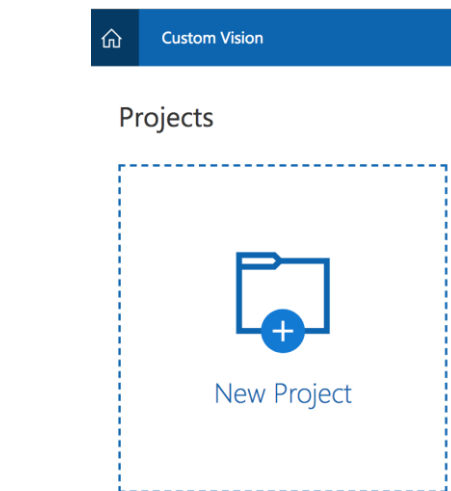# Homework 4

In this homework, we will work with the cognitive service provided by Microsoft Azure to build an image classifier according to our dataset and requirement.

Instructions

1. Go to https://customvision.ai/ and sign in with your Microsoft account. If you do not have it, just create one.

2. Once you sign in, you will see the page like below:

3. Click the "New Project" to create a new project. Here, I will build a classifier to differentiate between roses and lilies. So I will name my project as FlowerClassifier, and leave other options as default.

4. Go to the "TRAINING IMAGES" tab, now I will upload some images of both roses and lilies. Currently, I will upload 15 images tagged with rose and lily respectively. (In order to get reasonable result, the more the better)

5. After that, on the left panel, you can see 15 images are tagged with lily, and another 15 are tagged with rose.
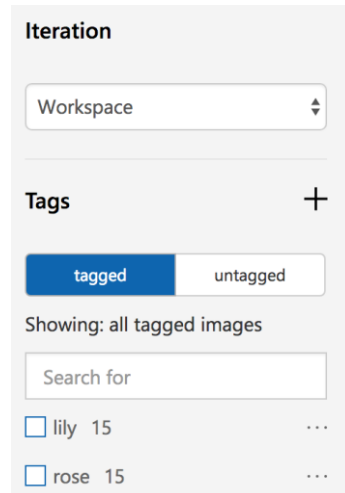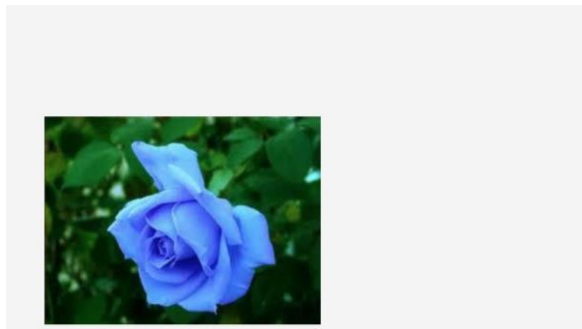

6. Go to "PERFORMANCE" tab, set the threshold to 90%, then click the "Train" button.
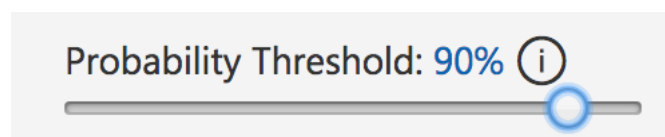
7. After a while, it will show you the performance of the iteration 1 training.
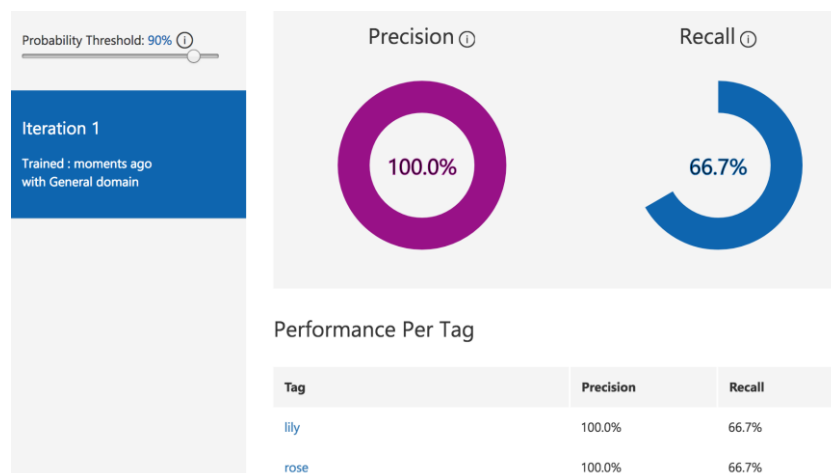
8. Click the "PREDICTIONS" tab or "Quick Test" button, you can upload some images to check the result.

Predictions

Tag	Probability
rose	96.3%
lily	2.5%

Predictions

Tag	Probability
rose	32.3%
lily	28.7%

9. As you can see the second image is lilies, but the prediction is not that good. Now let's upload more varied images to retrain the data.

Tags +

| tagged | untagged |

Showing: all tagged images

Search for

☐ lily 30 · · ·

☐ rose 30 · · ·

10. And see the performance and prediction result again.

Iteration 2

Trained : moments ago
with General domain

Iteration 1

Trained : 9 minutes ago
with General domain

Precision ⓘ   94.7%

Recall ⓘ   83.3%

Performance Per Tag

Tag	Precision	Recall
lily	100.0%	76.7%
rose	91.1%	90.0%

Predictions

Tag	Probability
rose	99.5%
lily	0.6%

Predictions

Tag	Probability
lily	80%
rose	8.2%

As we can see the result has been improved.

11, Now we have built a customized classifier, we can even use it through the cognitive API. The instructions can be found at https://docs.microsoft.com/en-us/azure/cognitive-services/custom-vision-service/use-prediction-api .

Enter image file path: D:\lilyTest.jpeg
{"id":"09f109d4-ca16-4d3c-a1d9-877e52c67cac","project":"f4893bc3-1594-4322-aa36-9e119637968e","iteration":"accc6b85-e336-41a8-9c77-f31eb1cfc9e4","created":"2018-06-10T01:01:24.220464Z","predictions":[{"probability":0.8002717,"tagId":"88ffcb9a-3bd5-483f-abd6-23bc69e7a655","tagName":"lily"},{"probability":0.0823491,"tagId":"885c5ea9-06bd-4905-8a10-c74c7e479410","tagName":"rose"}]}

Hit ENTER to exit...

As we can see from the response, for the lilyTest.jpeg file, probability for "lily" tag and "rose" tag is 0.8002717 and 0.0823491. The result matches the one for Iteration 2 from web page.

Now it's your turn to build your own classifier. You can choose whatever objects for your training images and then test it through the webpage and your own program. **Please remember to load your own dataset so that the results will be different among students' submissions.**

What to submit

1. The screenshot of performance result and prediction result for Iteration 1. (1 point)
2. The screenshot of performance result and prediction result for Iteration 2. (1 point)
3. The screenshot of the prediction result of the same image in Step 11 using the API to see whether it is consistent with Iteration 1's or Iteration 2's. (2 points)
4. Try to discuss your findings and the possible reasons, such as why your iteration 1&2 are different (better or worse), and the difficulty you met in this assignment. (3 points)

Submission Guideline

- The submission MUST be a pdf file named [Student First Name]_[Student Last Name]_HW4.pdf
- The deadline is Tuesday, June 26, 2018 11:59 PM PDT. No submissions will be accepted past the deadline.