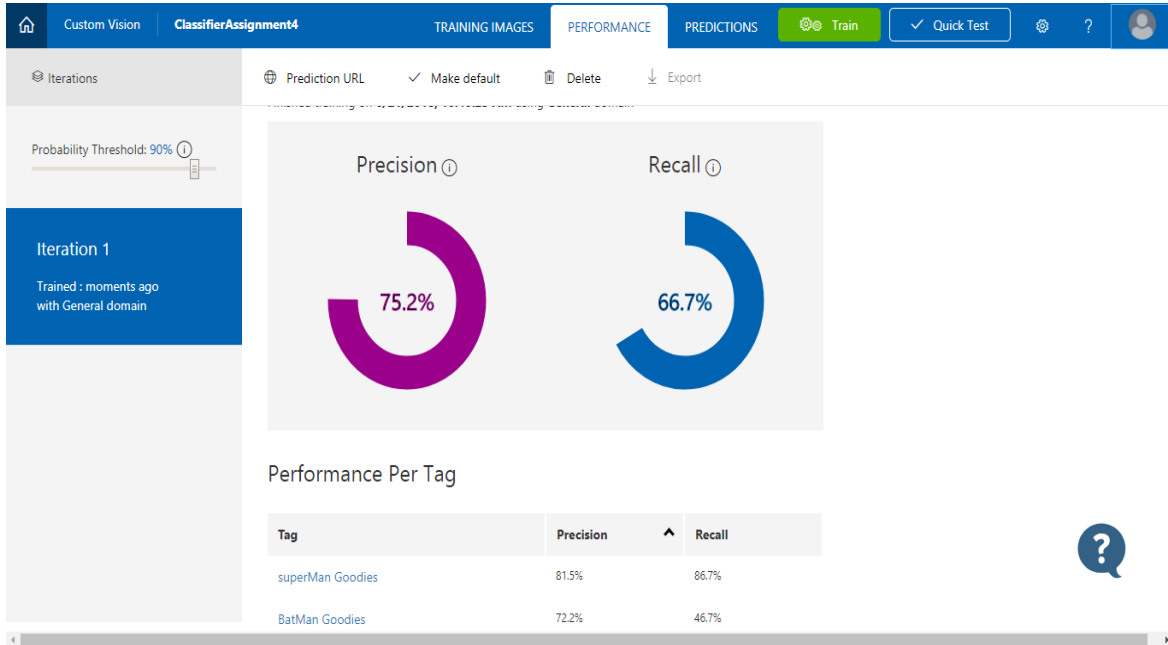


Bat Man Super Man Goodies Classifier

QUESTION 1

Iteration 1

PERFORMANCE RESULT



PREDICTION RESULT

Submit Image

Enter Image URL →

or

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Predictions

Tag	Probability
superMan Goodies	61.3%
BatMan Goodies	1.1%

Bat Man Super Man Goodies Classifier

The screenshot shows the Custom Vision Classifier interface. The main image is a cake with a Batman figure sitting on it, holding a book. The cake has text on it: "Jy's official Sum day!". The interface includes a left sidebar with "Refine" options (Iteration, Tags, Sort) and a right sidebar with "Submit Image" and "Predictions" sections.

Submit Image

Enter Image URL

or

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Predictions

Tag	Probability
superMan Goodies	81.5%
BatMan Goodies	39.4%

QUESTION 2

Iteration 2

PERFORMANCE RESULT

The screenshot shows the Custom Vision Classifier interface with the "PERFORMANCE" tab selected. The left sidebar shows "Iterations" with a list of training iterations. The main area displays "Precision" and "Recall" donut charts, and a "Performance Per Tag" table.

Iterations

Probability Threshold: 90%

Iteration 6
Trained : 5 minutes ago
with General domain

Iteration 5
Trained : 14 minutes ago
with General domain

Iteration 4
Trained : 23 minutes ago
with General domain

Precision 83.3%

Recall 62.8%

Performance Per Tag

Tag	Precision	Recall
BatMan Goodies	87.5%	60.8%
superMan Goodies	81.7%	64.4%

Bat Man Super Man Goodies Classifier

PREDICTION RESULT

Custom Vision

ClassifierAs

Refine

Iteration

Iteration 6

Tags

Showing: all predicted images

Search for

☐ BatMan Goodies

☐ superMan Goodies

Sort

☒ Suggested

☐ Newest

☐ Oldest

Submit Image

Enter Image URL

Browse local files

or

File formats accepted: jpg, png, bmp

File size should not exceed: 4mb

Predictions

Tag	Probability
superMan Goodies	96.9%
BatMan Goodies	1.5%

Custom Vision

ClassifierAs

Refine

Iteration

Iteration 6

Tags

Showing: all predicted images

Search for

☐ BatMan Goodies

☐ superMan Goodies

Sort

☒ Suggested

☐ Newest

☐ Oldest

Submit Image

Enter Image URL

Browse local files

or

File formats accepted: jpg, png, bmp

File size should not exceed: 4mb

Predictions

Tag	Probability
BatMan Goodies	85.5%
superMan Goodies	58.4%

Bat Man Super Man Goodies Classifier

Why I have Iteration 6 instead of Iteration 2

Here I was playing around with the tool, was looking into improving the precision and recall, I was adding Batman Goodies pictures with more blues and reds and was adding more superman Goodies pictures with Black so that my predictor can improve the detection of my test images. While playing around I added up to 50 images with different 5 different iteration, got my best results at Iteration 6. Hence displaying my results for iteration 1 and iteration 6. Iteration 2 details are attached here bellow for reference.

QUESTION 3

Iteration 1

PERFORMANCE RESULT USING API

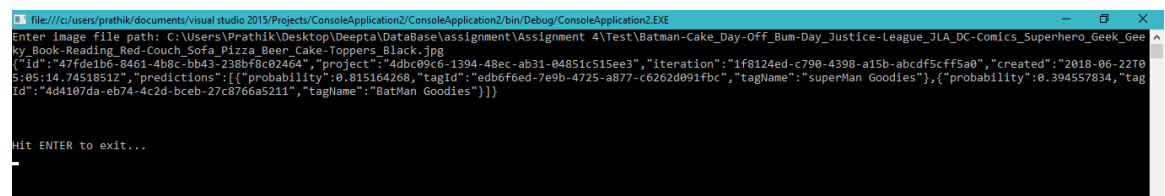
1. Batman Goodies Image

Enter image file path: C:\Users\Prathik\Desktop\Deepta\DataBase\assignment\Assignment 4\Test\Batman-Cake_Day-Off_Bum-Day_Justice-League_JLA_DC-Comics_Superhero_Geek_Geeky_Book-Reading_Red-Couch_Sofa_Pizza_Beer_Cake-Toppers_Black.jpg
{ "id": "47fde1b6-8461-4b8c-bb43-238bf8c02464", "project": "4dbc09c6-1394-48ec-ab31-04851c515ee3", "iteration": "1f8124ed-c790-4398-a15b-abcdf5cff5a0", "created": "2018-06-22T05:05:14.7451851Z", "predictions": [{" "probability": 0.815164268, "tagId": "edb6f6ed-7e9b-4725-a877-c6262d091fbc", "tagName": "superMan Goodies" }, {" "probability": 0.394557834, "tagId": "4d4107da-eb74-4c2d-bceb-27c8766a5211", "tagName": "BatMan Goodies" }] }

Superman Goodies = 81.5164268%

Batman Goodies = 39.4557834%

(accuracy is same as the one produced by the web interface in Page No: 2)



2. Superman Goodies Image

Enter image file path: C:\Users\Prathik\Desktop\Deepta\DataBase\assignment\Assignment 4\Test\672bda8d23e1ada59690cb3b82fa2897--superman-goodies.jpg
{ "id": "785936cd-05d0-4b72-a6aa-ee9078ecb648", "project": "4dbc09c6-1394-48ec-ab31-04851c515ee3", "iteration": "1f8124ed-c790-4398-a15b-abcdf5cff5a0", "created": "2018-06-22T05:12:18.0480479Z", "predictions": [{" "probability": 0.6139892, "tagId": "edb6f6ed-7e9b-4725-a877-c6262d091fbc", "tagName": "superMan

Bat Man Super Man Goodies Classifier

Goodies"}, {"probability": 0.0118717039, "tagId": "4d4107da-eb74-4c2d-bceb-27c8766a5211", "tagName": "BatMan Goodies"}]}}

Superman Goodies = 61.39892 %

Batman Goodies = 1.18717039 %

(accuracy is same as the one produced by the web interface in Page No: 1)

```
file:///c:/users/prathik/documents/visual studio 2015/Projects/ConsoleApplication2/ConsoleApplication2/bin/Debug/ConsoleApplication2.EXE
Enter image file path: C:\Users\Prathik\Desktop\Deepta\DataBase\assignment\Assignment 4\Test\672bda8d23e1ada59690cb3b82fa2897--superman-goodies.jpg
{"id": "785936cd-85d0-4b72-a6aa-ee9078ecb648", "project": "4dbc09c6-1394-48ec-ab31-04851c515ee3", "iteration": "1f8124ed-c790-4398-a15b-abcdf5cff5a0", "created": "2018-06-22T05:12:18.0480479Z", "predictions": [{"probability": 0.6139892, "tagId": "edb6f6ed-7e9b-4725-a877-c6262d091fbc", "tagName": "superMan Goodies"}, {"probability": 0.0118717039, "tagId": "4d4107da-eb74-4c2d-bceb-27c8766a5211", "tagName": "BatMan Goodies"}]}}
Hit ENTER to exit...
```

Iteration 2

PERFORMANCE RESULT USING API

1. SuperMan Goodies image

Superman Goodies = 96.947813%

Batman Goodies = 0.158191845%

(accuracy is same as the one produced by the web interface in Page No: 3)

```
file:///c:/users/prathik/documents/visual studio 2015/Projects/ConsoleApplication1/ConsoleApplication1/bin/Debug/ConsoleApplication1.EXE
Enter image file path: C:\Users\Prathik\Desktop\Deepta\DataBase\assignment\Assignment 4\Test\672bda8d23e1ada59690cb3b82fa2897--superman-goodies.jpg
{"id": "fb8a3f82-ef60-403c-a5c6-307ec40ff5ae", "project": "4dbc09c6-1394-48ec-ab31-04851c515ee3", "iteration": "9ceed91b-e01d-403b-9c4c-e093274aa20f", "created": "2018-06-21T19:50:32.9768671Z", "predictions": [{"probability": 0.96947813, "tagId": "edb6f6ed-7e9b-4725-a877-c6262d091fbc", "tagName": "superMan Goodies"}, {"probability": 0.0158191845, "tagId": "4d4107da-eb74-4c2d-bceb-27c8766a5211", "tagName": "BatMan Goodies"}]}}
Hit ENTER to exit...
```

2. Bat Man Goodies image

Batman Goodies = 85.5067134%

Superman Goodies = 58.4539163%

(accuracy is same as the one produced by the web interface in Page No: 3)

```
file:///c:/users/prathik/documents/visual studio 2015/Projects/ConsoleApplication1/ConsoleApplication1/bin/Debug/ConsoleApplication1.EXE
Enter image file path: C:\Users\Prathik\Desktop\Deepta\DataBase\assignment\Assignment 4\Test\Batman-Cake_Day-Off_Bum-Day_Justice-League_3LA_DC-Comics_Superhero_Geek_Geek_Book-Reading_Red-Couch_Sofa_Pizza_Beer_Cake-Toppers_Black.jpg
{"id": "92586aed-ab76-42f9-bc14-1757b66055e0", "project": "4dbc09c6-1394-48ec-ab31-04851c515ee3", "iteration": "9ceed91b-e01d-403b-9c4c-e093274aa20f", "created": "2018-06-21T19:44:04.5098373Z", "predictions": [{"probability": 0.855067134, "tagId": "4d4107da-eb74-4c2d-bceb-27c8766a5211", "tagName": "BatMan Goodies"}, {"probability": 0.584531963, "tagId": "edb6f6ed-7e9b-4725-a877-c6262d091fbc", "tagName": "superMan Goodies"}]}}
Hit ENTER to exit...
```

Bat Man Super Man Goodies Classifier

QUESTION 4

COMPARITION BETWEEN ITERATION 1 AND ITERATION 2

1. Iteration1
 - a. In iteration 1 I trained the classifier with 15 images of superman goodie and batman goodies each.
 - b. The model achieved 75.2% precision and 66.5% recall.
 - c. To test the model, I gave two images one of each class.
 - d. The model classified superman goodie image with high accuracy (61.39892 %) but batman goodie image was misclassified (39.4557834 %) guessing the batman goodie as superman goodie with 81.5164268% because the batman goodie image had lots of blues and reds just like the superman goodies training set.
2. Iteration 2
 - a. In iteration 2 I trained the classifier with 45 images of superman goodies and batman goodies each.
 - b. The model achieved 83.3% precision and 62.8% recall.
 - c. To test the model, I gave two images one of each class.
 - d. This time the model classified the batman goodie image with high accuracy of 85.5067134% and also improved its prediction for superman goodie image with a value of 96.947813%

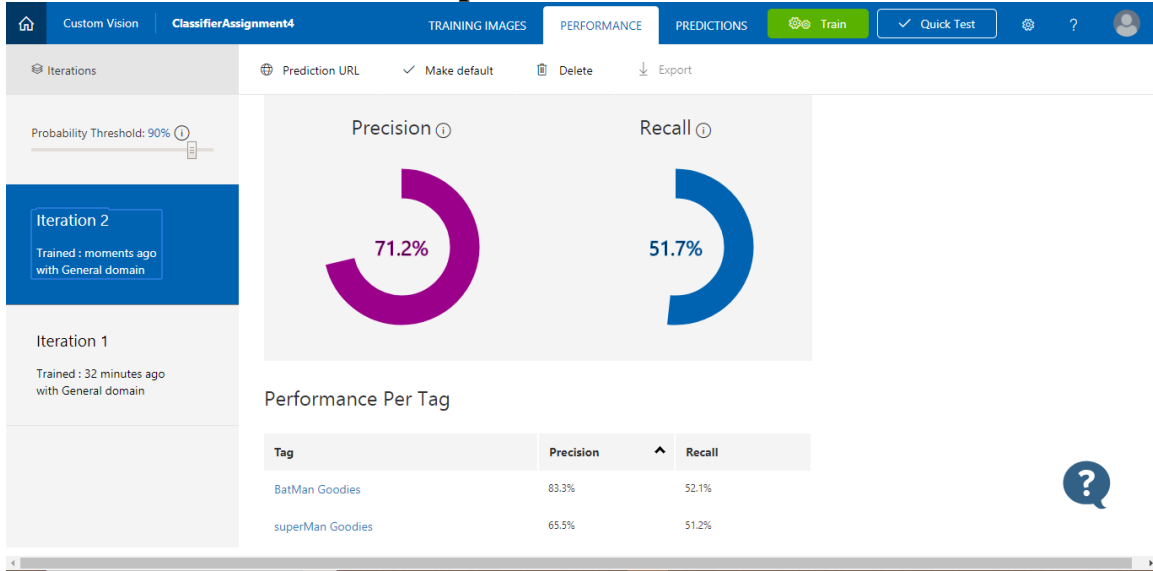
REASONS WHY ITERATION 2 PREDICTS BETTER:

1. The above prediction improved since more training image was added. Also, I added more batman goodie images with blues and reds so that the model can be trained to detect batman images apart from just color classification. This helped the classifier predict and detect batman image with blues and reds better.
2. Reason why superman goodie image was detected with higher accuracy was because, I trained the model with more images of superman goodie images of jewelry like the test data. This made the model detect 'S' shaped jewelry items better from the test data.
3. Usually ML and Data Mining algorithm work better with more data, here 45 is still a small number, to get the best results with this algorithm large dataset would have helped.

DIFFICULTIES FACED IN THE ASSIGNMENT

1. Trying to bring up the precision and recall value with more data was challenging. Since I was feeding the model with more multicolored photos of batman goodie images and superman goodie images, the machine was not clearly distinguishing the goodies.
2. Here is the picture of low precision and recall rate in iteration 2

Bat Man Super Man Goodies Classifier



3. After multiple addition of images with multicolor background, finally with iteration 6 my precision increased thus classifying the batman goodie image with high accuracy.