Big Data Analytics and Applications Lab Assignment 10

Class Id: 30
Student Id: 16221783
Student Name: Vikesh Padarthi

Task 1:

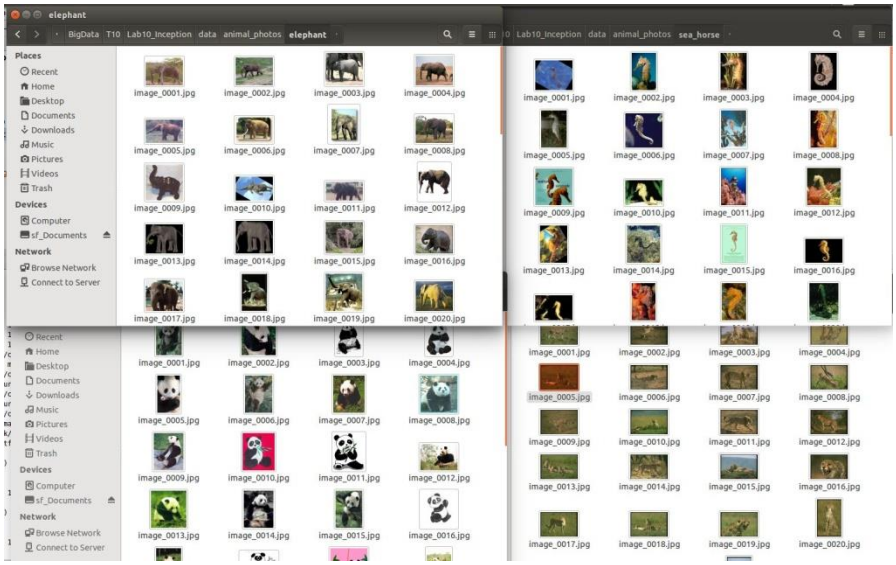
TensorFlow Programming:

TensorFlow Programming:
Write a TensorFlow program for the following Task.
a.Retrain Inception Model final layer for Image Dataset that is not covered in class. Report accuracy etc.
b.Visualizations (Tensor Board): training, loss, weights etc. and validation
c.Report Confusion Matrix for training and validation/testing.

Dataset:

I have taken the some part of Caltech101 data set. My dataset contains 4 different classes. The classes are 'elephant','leopard','sea horse' and 'panda'.

Following images are part of dataset.



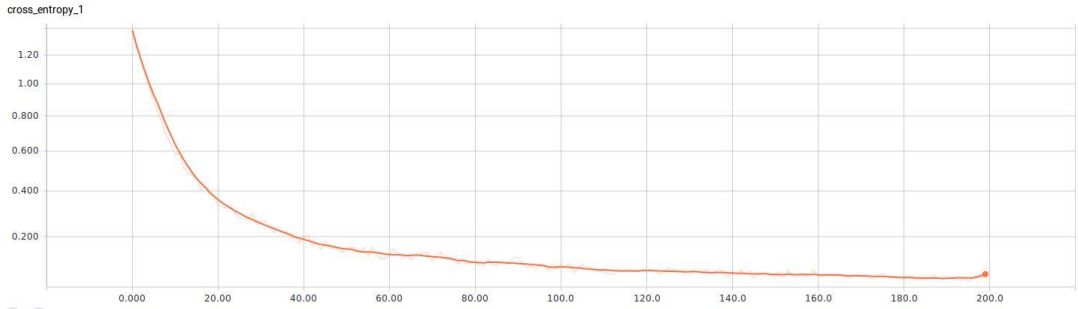
Labels generated after training the model.

Generated Accuracy and confusion matrix

```
2017-04-05 20:12:30.071255: Step 150: Cross entropy = 0.048791
2017-04-05 20:12:30.149906: Step 150: Validation accuracy = 100.0% (N=100)
2017-04-05 20:12:31.330015: Step 160: Train accuracy = 100.0%
2017-04-05 20:12:31.330085: Step 160: Cross entropy = 0.047119
2017-04-05 20:12:31.409525: Step 160: Validation accuracy = 100.0% (N=100)
2017-04-05 20:12:32.581589: Step 170: Train accuracy = 100.0%
2017-04-05 20:12:32.581644: Step 170: Cross entropy = 0.047075
2017-04-05 20:12:32.683637: Step 170: Validation accuracy = 100.0% (N=100)
2017-04-05 20:12:33.917250: Step 180: Train accuracy = 100.0%
2017-04-05 20:12:33.917304: Step 180: Cross entropy = 0.034710
2017-04-05 20:12:33.997942: Step 180: Validation accuracy = 100.0% (N=100)
2017-04-05 20:12:35.262833: Step 190: Train accuracy = 100.0%
2017-04-05 20:12:35.262893: Step 190: Cross entropy = 0.044815
2017-04-05 20:12:35.337195: Step 190: Validation accuracy = 100.0% (N=100)
2017-04-05 20:12:36.468883: Step 199: Train accuracy = 100.0%
2017-04-05 20:12:36.468941: Step 199: Cross entropy = 0.054332
2017-04-05 20:12:36.564624: Step 199: Validation accuracy = 100.0% (N=100)
Final test accuracy = 100.0% (N=23)
Converted 2 variables to const ops.
Confusion Matrix:
---------------------------------
6   0   0   0

0   11  0   0

0   0   2   0

0   0   0   4

---------------------------------
```

Visualizations generated on Tensorboard.

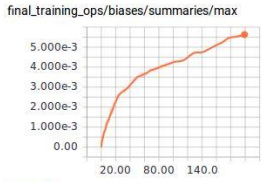
cross_entropy_1

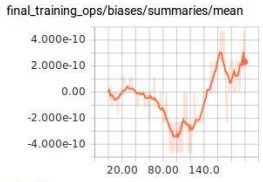


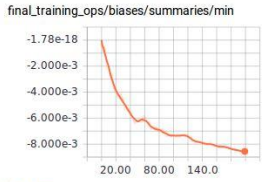
accuracy_1

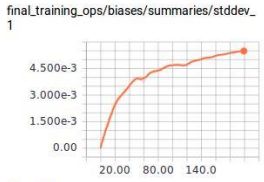
cross_entropy_1

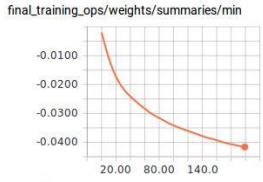
final_training_ops

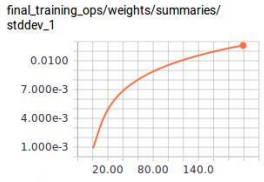




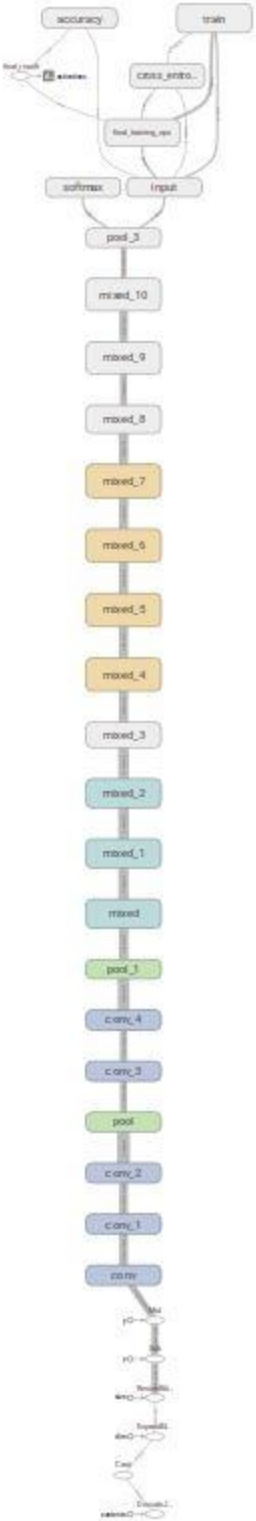








Main Graph


accuracy
train
softmax
input
pool_3
mixed_10
mixed_9
mixed_8
mixed_7
mixed_6
mixed_5
mixed_4
mixed_3
mixed_2
mixed_1
mixed
pool_1
conv_4
conv_3
pool
conv_2
conv_1
conv

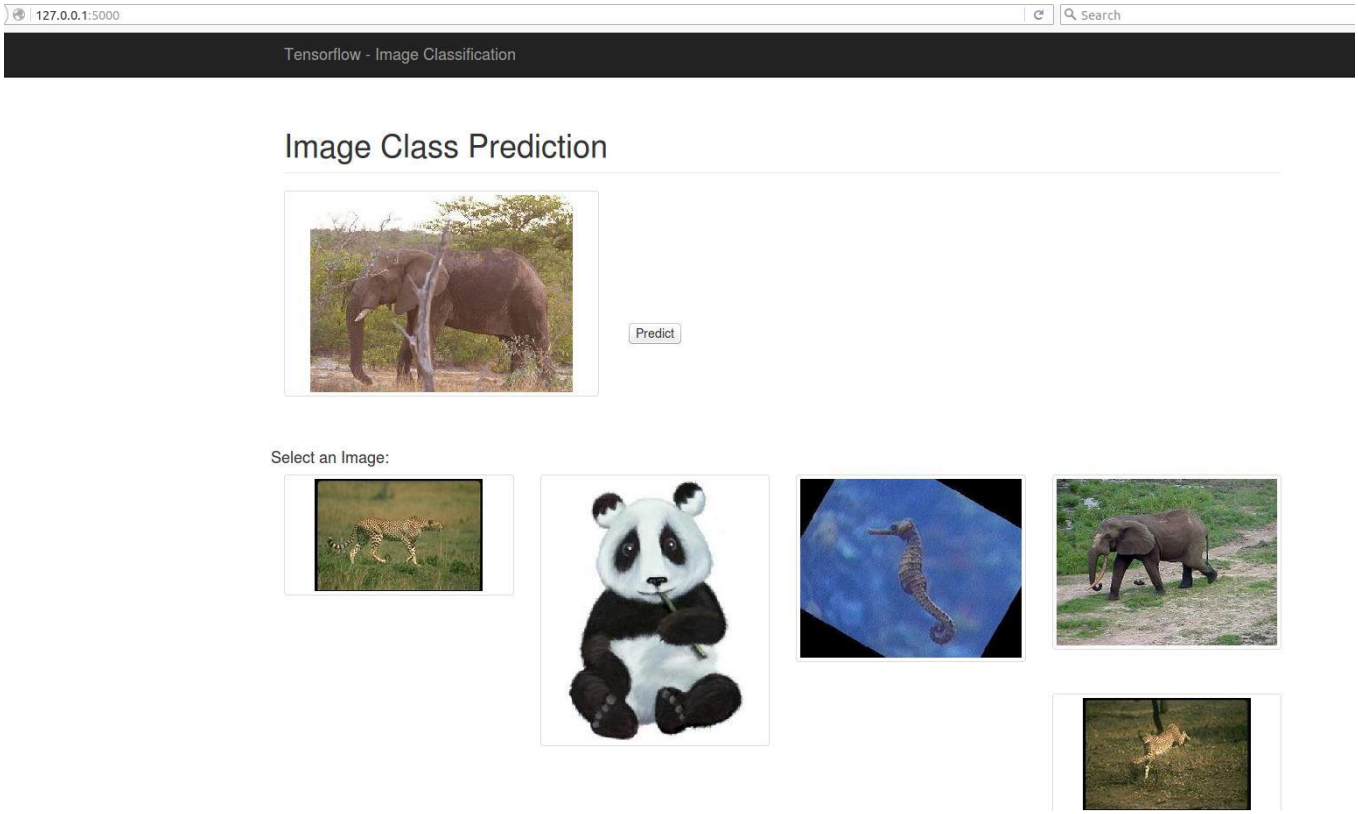
Task 2:

Develop a Web-based Application for Visual Question Answering that is relevant to your own project including the following features
a.Web application for Visual Question answering
b.Connect the web application to TensorFlow API

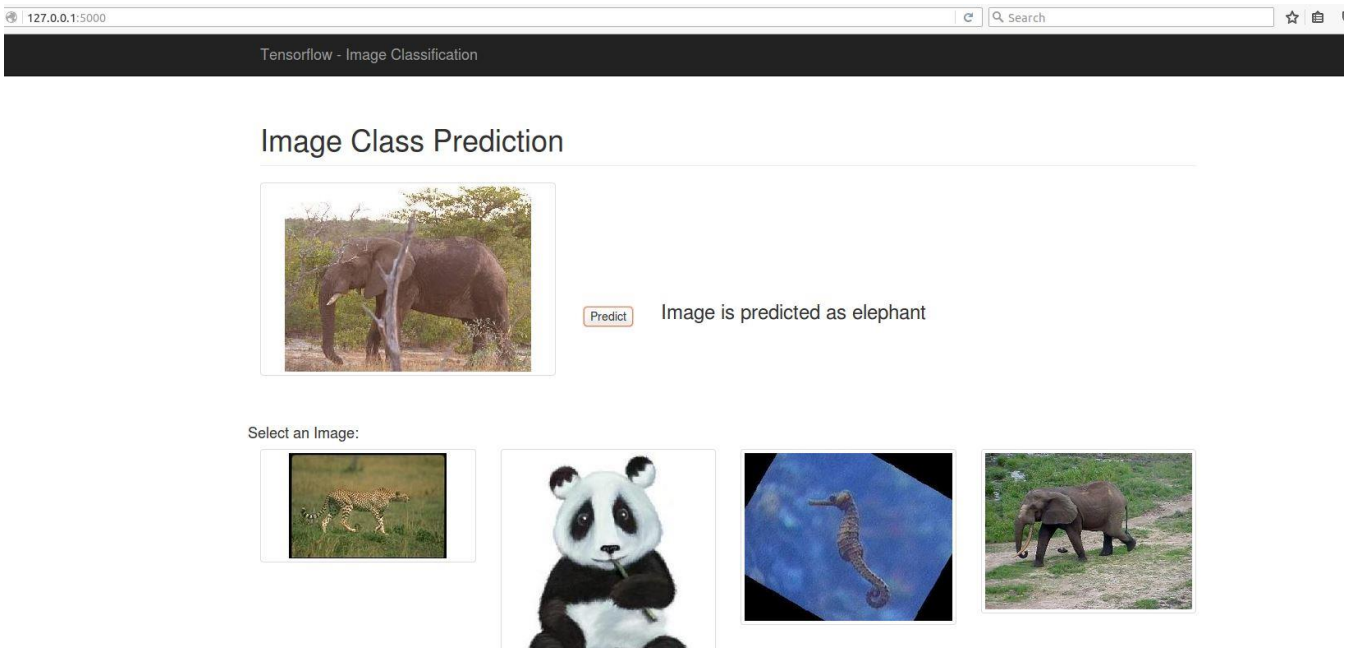
Instance of visual question answering system running on local host

```
(tensorflow)ramgopal@ramgopal-VirtualBox:~/Documents/BigData/T10/Lab10_web/tensorflow-cnn-web$ python
 * Serving Flask app "label_image"
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

Corresponding webpage

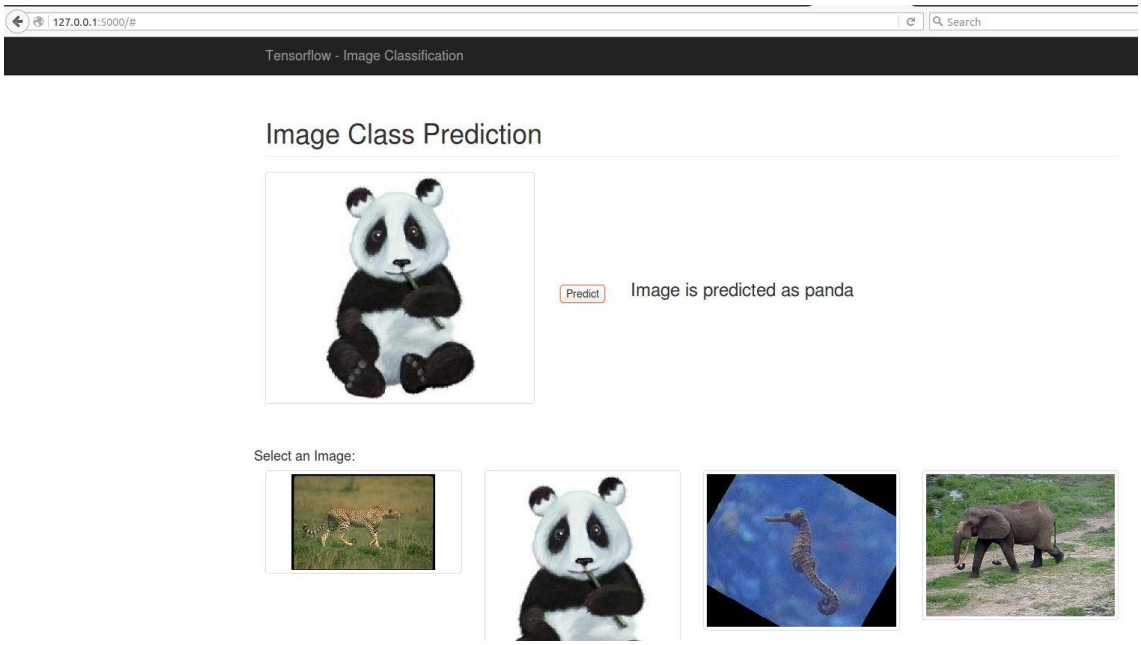


Prediction Result-1




```
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE3 instructions, but t
hese are available on your machine and could speed up CPU computations.
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE4.1 instructions, but
 these are available on your machine and could speed up CPU computations.
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE4.2 instructions, but
 these are available on your machine and could speed up CPU computations.
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use AVX instructions, but th
ese are available on your machine and could speed up CPU computations.
W tensorflow/core/framework/op_def_util.cc:332] Op BatchNormWithGlobalNormalization is deprecated. It will cease to work i
n GraphDef version 9. Use tf.nn.batch_normalization().
elephant (score = 0.98835)
sea horse (score = 0.00517)
panda (score = 0.00326)
leopard (score = 0.00322)
127.0.0.1 - - [05/Apr/2017 18:35:52] "POST /api/predict HTTP/1.1" 200 -
```

Prediction Result_2




```
127.0.0.1 - - [05/Apr/2017 18:35:52] "POST /api/predict HTTP/1.1" 200 -
panda (score = 0.97815)
sea horse (score = 0.01155)
elephant (score = 0.00751)
leopard (score = 0.00280)
127.0.0.1 - - [05/Apr/2017 18:37:29] "POST /api/predict HTTP/1.1" 200 -
```