

# Lab Assignment 8

Class Id: 30

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## Task 1:

### 1.TensorFlow Programming:

Write a TensorFlow program for the following Task. a. Implement SoftMax Classification for Image Dataset that is not covered in class. Report accuracy, b.Visualizations(Tensor Board): training and testing both.

### Dataset:

I have taken the some images from COIL data set. This is Columbia University Image Library. This dataset contains around 100 objects and each image contains 360 views. I have taken only two 'car' and 'duck' images in training as well as test data.

### Input Dataset



I have converted the given images to mnist like dataset using the following code.

## Code to convert the images like mnist data

```
1 import os
2 from PIL import Image
3 from array import *
4 from random import shuffle
5
6 # Load from and save to
7 Names = ['./training-images', 'train', ['./test-images', 'test']]
8
9 for name in Names:
10     data_image = array('B')
11     data_label = array('B')
12     fileList = []
13     for dirname in os.listdir(name[0]): # [1:] Excludes .DS_Store from Mac OS
14         path = os.path.join(name[0], dirname)
15         for filename in os.listdir(path):
16             if filename.endswith('.png'):
17                 fileList.append(os.path.join(name[0], dirname, filename))
18
19 shuffle(fileList) # Useful for further segmenting the validation set
20
21 for filename in fileList:
22     label = int(filename.split('/')[-1][2])
23     im = Image.open(filename)
24     pixel = im.load()
25     width, height = im.size
26     for x in range(0, width):
27         for y in range(0, height):
28             data_image.append(pixel[x][y])
29
30 data_label.append(label) # Labels start (one unsigned byte each)
31
32 hexval = "(%09d)" % len(fileList)
33 # number of files in HEX
34
35 # Header for training set
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880 # Header for test set
881 header = array('B', [0] * 10)
882 header[0] = 0
883 header[1] = 0
884 header[2] = 0
885 header[3] = 0
886 header[4] = 0
887 header[5] = 0
888 header[6] = 0
889 header[7] = 0
890 header[8] = 0
891 header[9] = 0
892
893 # Header for training set
894 header = array('B', [0] * 10)
895 header[0] = 0
896 header[1] = 0
897 header[2] = 0
898 header[3] = 0
899 header[4] = 0
900 header[5] = 0
901 header[6] = 0
902 header[7] = 0
903 header[8] = 0
904 header[9] = 0
905
906 # Header for test set
907 header = array('B', [0] * 10)
908 header[0] = 0
909 header[1] = 0
910 header[2] = 0
911 header[3] = 0
912 header[4] = 0
913 header[5] = 0
914 header[6] = 0
915 header[7] = 0
916 header[8] = 0
917 header[9] = 0
918
919 # Header for training set
920 header = array('B', [0] * 10)
921 header[0] = 0
922 header[1] = 0
923 header[2] = 0
924 header[3] = 0
925 header[4] = 0
926 header[5] = 0
927 header[6] = 0
928 header[7] = 0
929 header[8] = 0
930 header[9] = 0
931
932 # Header for test set
933 header = array('B', [0] * 10)
934 header[0] = 0
935 header[1] = 0
936 header[2] = 0
937 header[3] = 0
938 header[4] = 0
939 header[5] = 0
940 header[6] = 0
941 header[7] = 0
942 header[8] = 0
943 header[9] = 0
944
945 # Header for training set
946 header = array('B', [0] * 10)
947 header[0] = 0
948 header[1] = 0
949 header[2] = 0
950 header[3] = 0
951 header[4] = 0
952 header[5] = 0
953 header[6] = 0
954 header[7] = 0
955 header[8] = 0
956 header[9] = 0
957
958 # Header for test set
959 header = array('B', [0] * 10)
960 header[0] = 0
961 header[1] = 0
962 header[2] = 0
963 header[3] = 0
964 header[4] = 0
965 header[5] = 0
966 header[6] = 0
967 header[7] = 0
968 header[8] = 0
969 header[9] = 0
970
971 # Header for training set
972 header = array('B', [0] * 10)
973 header[0] = 0
974 header[1] = 0
975 header[2] = 0
976 header[3] = 0
977 header[4] = 0
978 header[5] = 0
979 header[6] = 0
980 header[7] = 0
981 header[8] = 0
982 header[9] = 0
983
984 # Header for test set
985 header = array('B', [0] * 10)
986 header[0] = 0
987 header[1] = 0
988 header[2] = 0
989 header[3] = 0
990 header[4] = 0
991 header[5] = 0
992 header[6] = 0
993 header[7] = 0
994 header[8] = 0
995 header[9] = 0
996
997 # Header for training set
998 header = array('B', [0] * 10)
999 header[0] = 0
1000 header[1] = 0
1001 header[2] = 0
1002 header[3] = 0
1003 header[4] = 0
1004 header[5] = 0
1005 header[6] = 0
1006 header[7] = 0
1007 header[8] = 0
1008 header[9] = 0
1009
1010 # Header for test set
1011 header = array('B', [0] * 10)
1012 header[0] = 0
1013 header[1] = 0
1014 header[2] = 0
1015 header[3] = 0
1016 header[4] = 0
1017 header[5] = 0
1018 header[6] = 0
1019 header[7] = 0
1020 header[8] = 0
1021 header[9] = 0
1022
1023 # Header for training set
1024 header = array('B', [0] * 10)
1025 header[0] = 0
1026 header[1] = 0
1027 header[2] = 0
1028 header[3] = 0
1029 header[4] = 0
1030 header[5] = 0
1031 header[6] = 0
1032 header[7] = 0
1033 header[8] = 0
1034 header[9] = 0
1035
1036 # Header for test set
1037 header = array('B', [0] * 10)
1038 header[0] = 0
1039 header[1] = 0
1040 header[2] = 0
1041 header[3] = 0
1042 header[4] = 0
1043 header[5] = 0
1044 header[6] = 0
1045 header[7] = 0
1046 header[8] = 0
1047 header[9] = 0
1048
1049 # Header for training set
1050 header = array('B', [0] * 10)
1051 header[0] = 0
1052 header[1] = 0
1053 header[2] = 0
1054 header[3] = 0
1055 header[4] = 0
1056 header[5] = 0
1057 header[6] = 0
1058 header[7] = 0
1059 header[8] = 0
1060 header[9] = 0
1061
1062 # Header for test set
1063 header = array('B', [0] * 10)
1064 header[0] = 0
1065 header[1] = 0
1066 header[2] = 0
1067 header[3] = 0
1068 header[4] = 0
1069 header[5] = 0
1070 header[6] = 0
1071 header[7] = 0
1072 header[8] = 0
1073 header[9] = 0
1074
1075 # Header for training set
1076 header = array('B', [0] * 10)
1077 header[0] = 0
1078 header[1] = 0
1079 header[2] = 0
1080 header[3] = 0
1081 header[4] = 0
1082 header[5] = 0
1083 header[6] = 0
1084 header[7] = 0
1085 header[8] = 0
1086 header[9] = 0
1087
1088 # Header for test set
1089 header = array('B', [0] * 10)
1090 header[0] = 0
1091 header[1] = 0
1092 header[2] = 0
1093 header[3] = 0
1094 header[4] = 0
1095 header[5] = 0
1096 header[6] = 0
1097 header[7] = 0
1098 header[8] = 0
1099 header[9] = 0
1100
1101 # Header for training set
1102 header = array('B', [0] * 10)
1103 header[0] = 0
1104 header[1] = 0
1105 header[2] = 0
1106 header[3] = 0
1107 header[4] = 0
1108 header[5] = 0
1109 header[6] = 0
1110 header[7] = 0
1111 header[8] = 0
1112 header[9] = 0
1113
1114 # Header for test set
1115 header = array('B', [0] * 10)
1116 header[0] = 0
1117 header[1] = 0
1118 header[2] = 0
1119 header[3] = 0
1120 header[4] = 0
1121 header[5] = 0
1122 header[6] = 0
1123 header[7] = 0
1124 header[8] = 0
1125 header[9] = 0
1126
1127 # Header for training set
1128 header = array('B', [0] * 10)

```

```

W:0
b:0
W:0
b:0
[array([[ 0.,  0.,  0., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ...,  0.,  0.,  0.],
        ...,
        [ 0.,  0.,  0., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ...,  0.,  0.,  0.]], dtype=float32), array([-0.1227937,  0.34265223, -0.061
        0.36081231,  0.04051079,  0.2901822, -0.72707415, -0.14662132], dtype=float32), array([[ 0.
        [ 0.,  0.,  0., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ...,  0.,  0.,  0.],
        [ 0.,  0.,  0., ...,  0.,  0.,  0.]], dtype=float32), array([-0.1227937,  0.34265223, -0.061
        0.36081231,  0.04051079,  0.2901822, -0.72707415, -0.14662132], dtype=float32))]
0.9064

```

Process finished with exit code 0

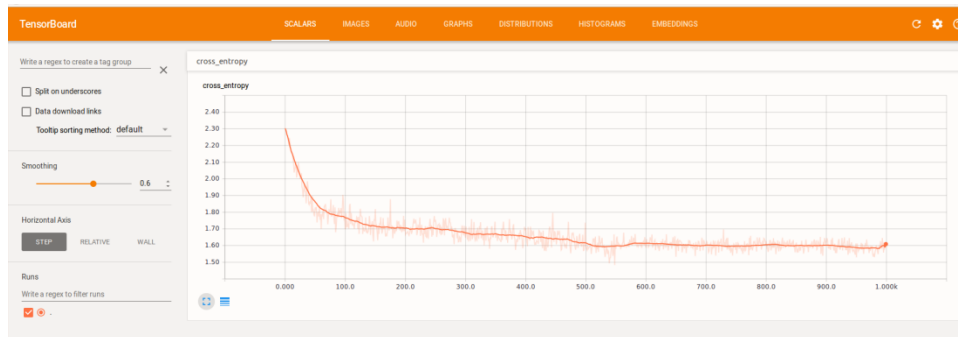
## Launching Visualization

```

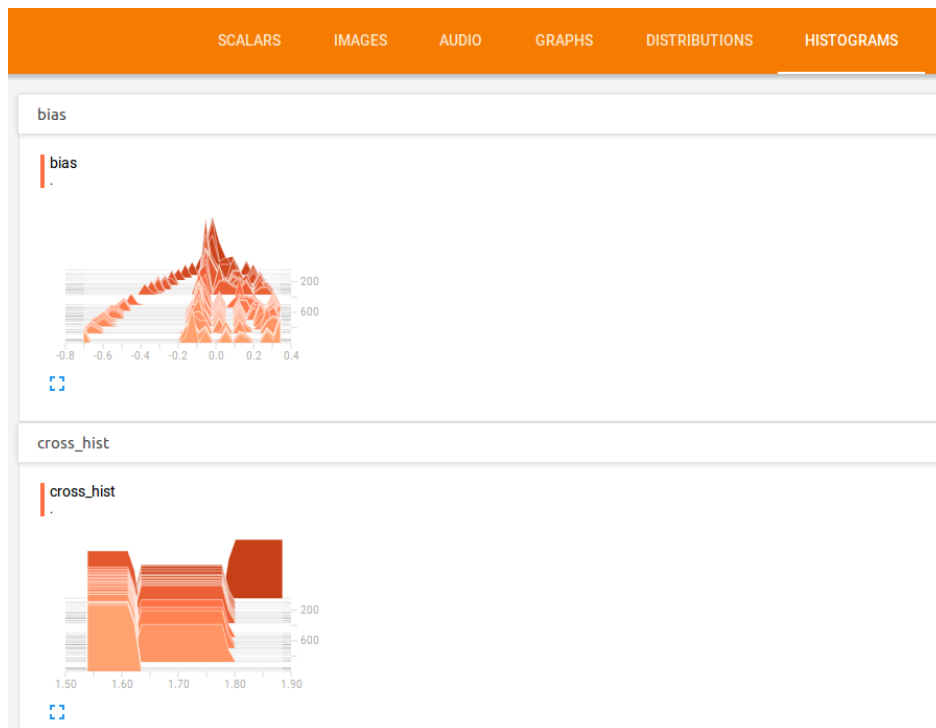
(tensorflow)ramgopal@ramgopal-VirtualBox:~/Documents/BigData/T8/MNIST_SOFTMAX/data$ cd coil_model
(tensorflow)ramgopal@ramgopal-VirtualBox:~/Documents/BigData/T8/MNIST_SOFTMAX/data/coil_model$
(tensorflow)ramgopal@ramgopal-VirtualBox:~/Documents/BigData/T8/MNIST_SOFTMAX/data/coil_model$ tensorboard --logdir=logs/train
Starting TensorBoard b'41' on port 6006
(You can navigate to http://127.0.1.1:6006)

```

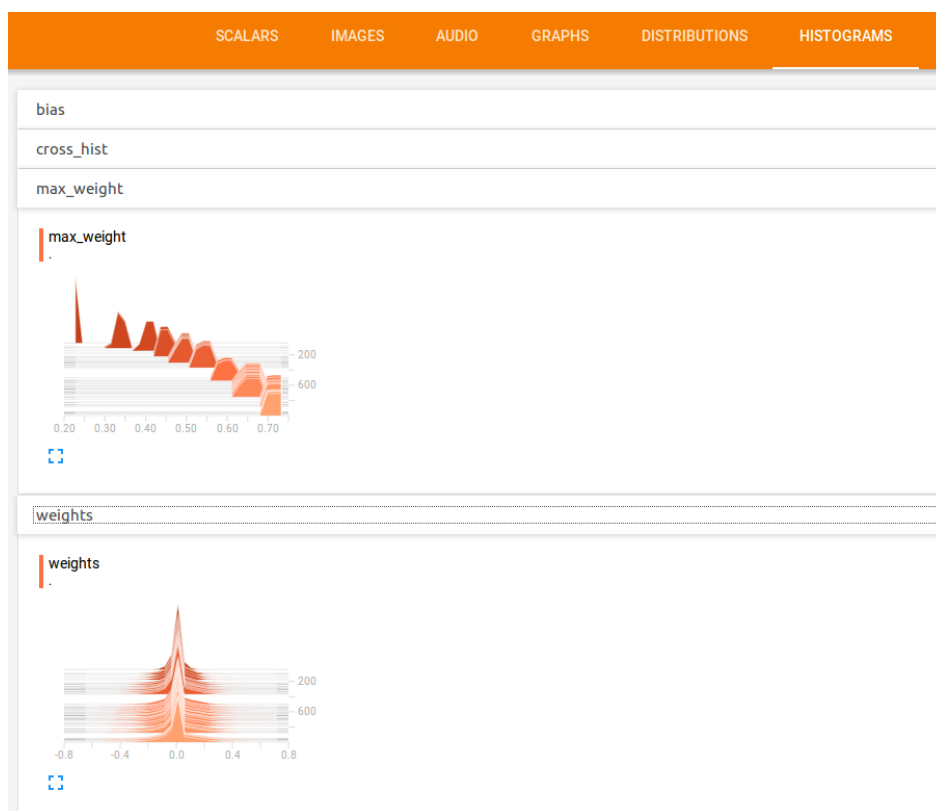
## Cross Entropy Visualization



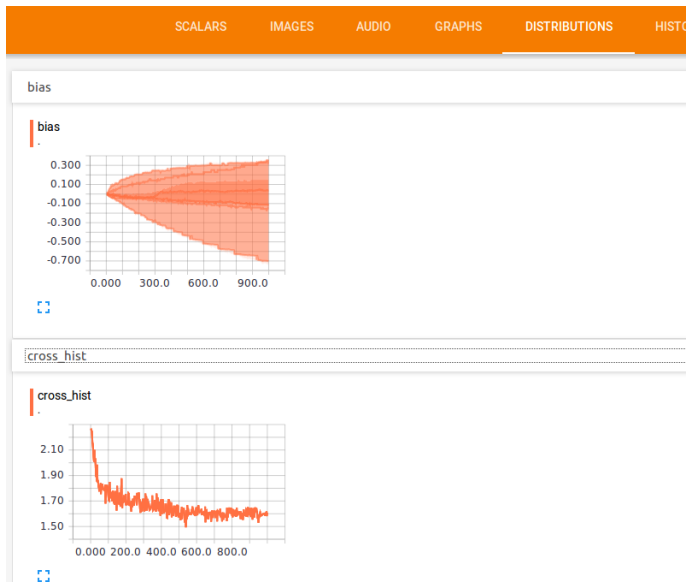
## Histograms Visualization



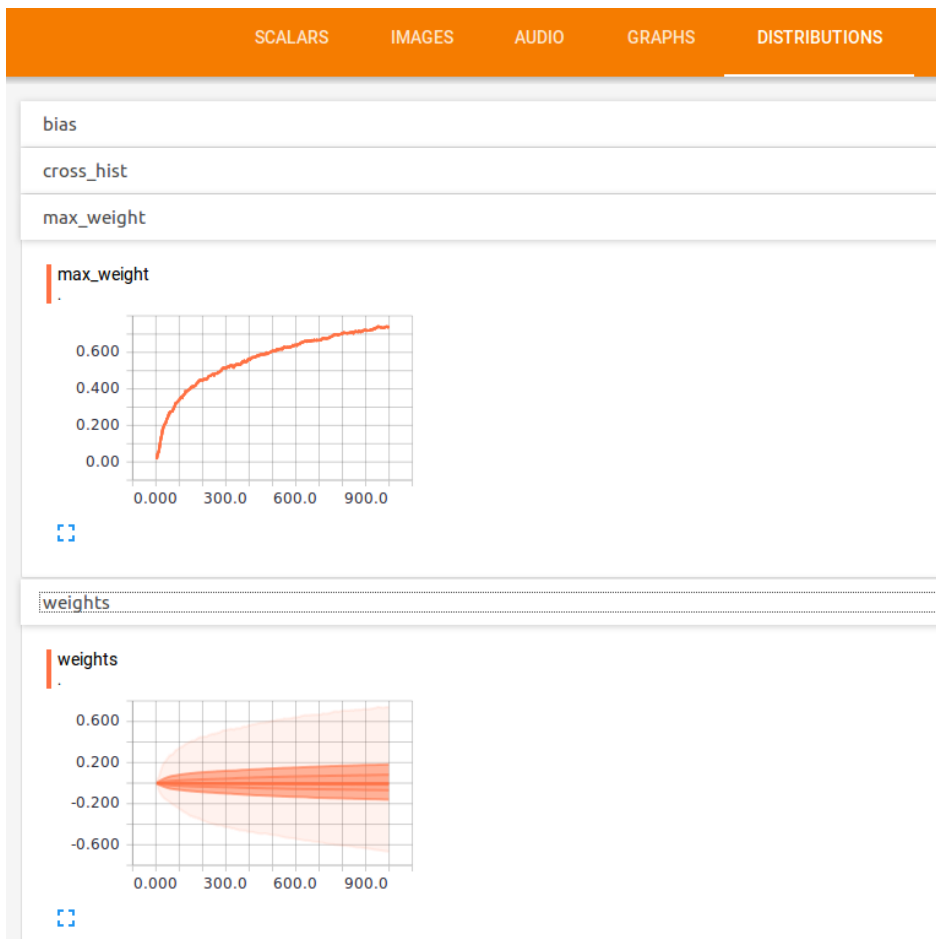
## Histograms Visualization



## Distributions Visualizations



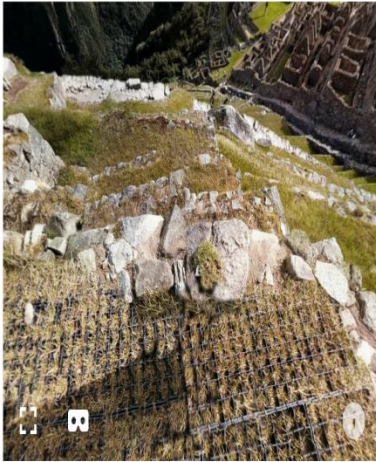
## Distributions Visualizations



## Graph Visualizations

## Application Home Page

## Machu Picchu VR Video

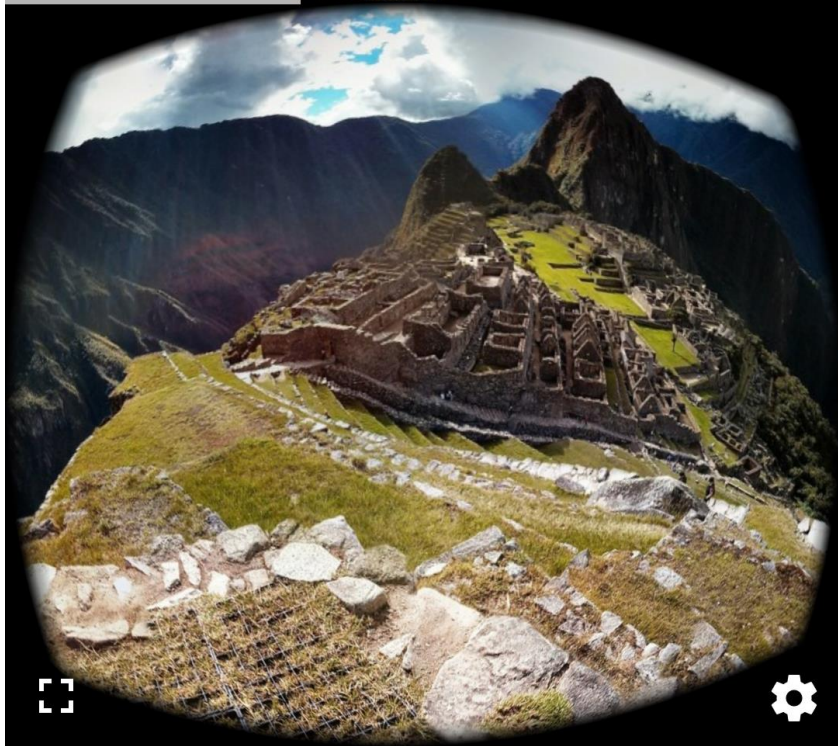


A 360 panoramic view of Machu Picchu

Source [Wikipedia](#)

**360 video**





360 video

360 video



