Lab Assignment 7

Class Id: 30
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Task 1:

1.TensorFlow Programming:

Write a TensorFlow program for the following Task. a.Implement linear regression for dataset that is not covered in class (e.g. Boston Dataset - https://archive.ics.uci.edu/ml/datasets/Housing).b.Plot training cost using Matplotlib in python. c.Implement cross-validation (Optional)In the Wiki Page, include a brief description of your dataset and your approach/results for this task.

Dataset:

I have taken Boston Housing Data Set as the input dataset. It has 13 columns and 506 rows of data.But I have used only one column from the given dataset. I have taken 'Average number of rooms per dwelling' as input variable and 'Price of the house' as the output variable.

Code to read Boston Dataset

```
from __future__ import print_function
import tensorflow as tf
import numpy as np
from sklearn.datasets import load_boston
import pandas as pd
import matplotlib.pyplot as plt


rng = np.random

boston = load_boston()
print('-------------------------------------------------------------------------')
print('Number of rows and columns on Boston DataSet:'+str(boston.data.shape))
print('-------------------------------------------------------------------------')
print('Keys in Boston Dataset'+str(boston.keys()))
print('-------------------------------------------------------------------------')
print('Features in Boston Dataset'+str(boston.feature_names))
print('-------------------------------------------------------------------------')
print('Description of Boston Description'+boston.DESCR)
print('-------------------------------------------------------------------------')
features = np.array(boston.data)

bos = pd.DataFrame(boston.data)

trX = np.array(bos[5])

trY = np.array(boston.target)

# create symbolic variables
```

Dataset Details

```
test | test
/usr/bin/python3.4 /home/ramgopal/Documents/BigData/T7/TensorflowHelloWorld/test.py
--------------------------------------------------------------------------------
Number of rows and columns on Boston DataSet:(506, 13)
--------------------------------------------------------------------------------
Keys in Boston Datasetdict_keys(['data', 'feature_names', 'DESCR', 'target'])
--------------------------------------------------------------------------------
Features in Boston Dataset['CRIM' 'ZN' 'INDUS' 'CHAS' 'NOX' 'RM' 'AGE' 'DIS' 'RAD' 'TAX' 'PTRATIO'
 'B' 'LSTAT']
--------------------------------------------------------------------------------
Description of Boston DescriptionBoston House Prices dataset
===========================

Notes
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Data Set Characteristics:

    :Number of Instances: 506

    :Number of Attributes: 13 numeric/categorical predictive

    :Median Value (attribute 14) is usually the target

    :Attribute Information (in order):
        - CRIM     per capita crime rate by town
        - ZN       proportion of residential land zoned for lots over 25,000 sq.ft.
        - INDUS    proportion of non-retail business acres per town
        - CHAS     Charles River dummy variable (= 1 if tract bounds river; 0 otherwise)
        - NOX      nitric oxides concentration (parts per 10 million)
        - RM       average number of rooms per dwelling
        - AGE      proportion of owner-occupied units built prior to 1940
        - DIS      weighted distances to five Boston employment centres
        - RAD      index of accessibility to radial highways
        - TAX      full-value property-tax rate per $10,000
        - PTRATIO  pupil-teacher ratio by town
        - B        1000(Bk - 0.63)^2 where Bk is the proportion of blacks by town
        - LSTAT    % lower status of the population
        - MEDV     Median value of owner-occupied homes in $1000's

    :Missing Attribute Values: None

    :Creator: Harrison, D. and Rubinfeld, D.L.

This is a copy of UCI ML housing dataset.
http://archive.ics.uci.edu/ml/datasets/Housing
```

- I have predicted the data using Linear Regression algorithm by using Tensorflow.

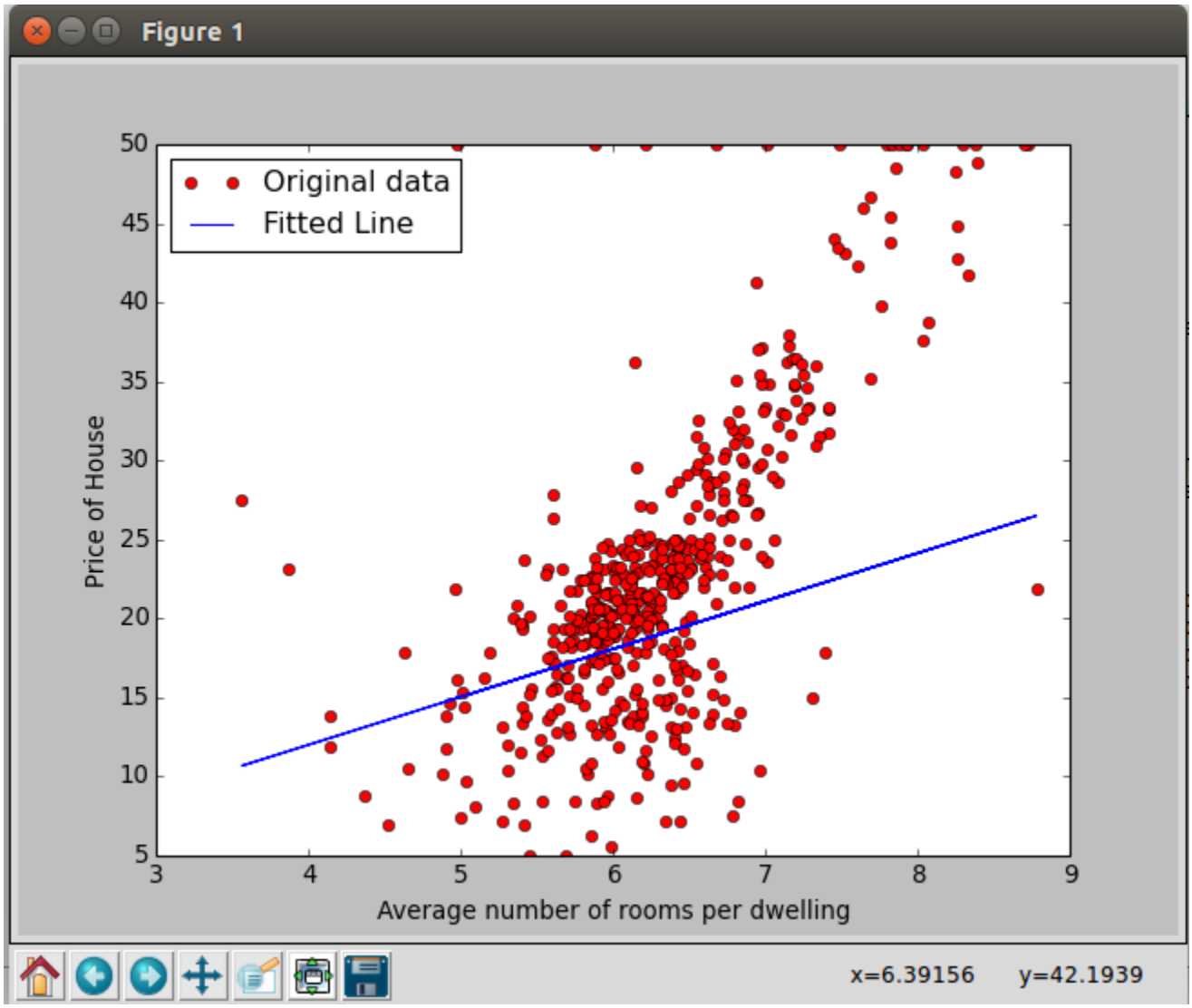
Training and Testing Results

```
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't c
W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't c
Optimization Finished!
--------------------------------------------------------------------------------
Training cost= 37.3686 W= 3.03027 b= -0.113014

--------------------------------------------------------------------------------
Testing... (Mean square loss Comparison)
Testing cost= 1.42109e-14
Absolute mean square loss difference: 37.3686
--------------------------------------------------------------------------------
```

- X coordinate implies Average number of rooms per dwelling and Y Coordinate implies Price of the house.

Graph plotted for training cost of the model



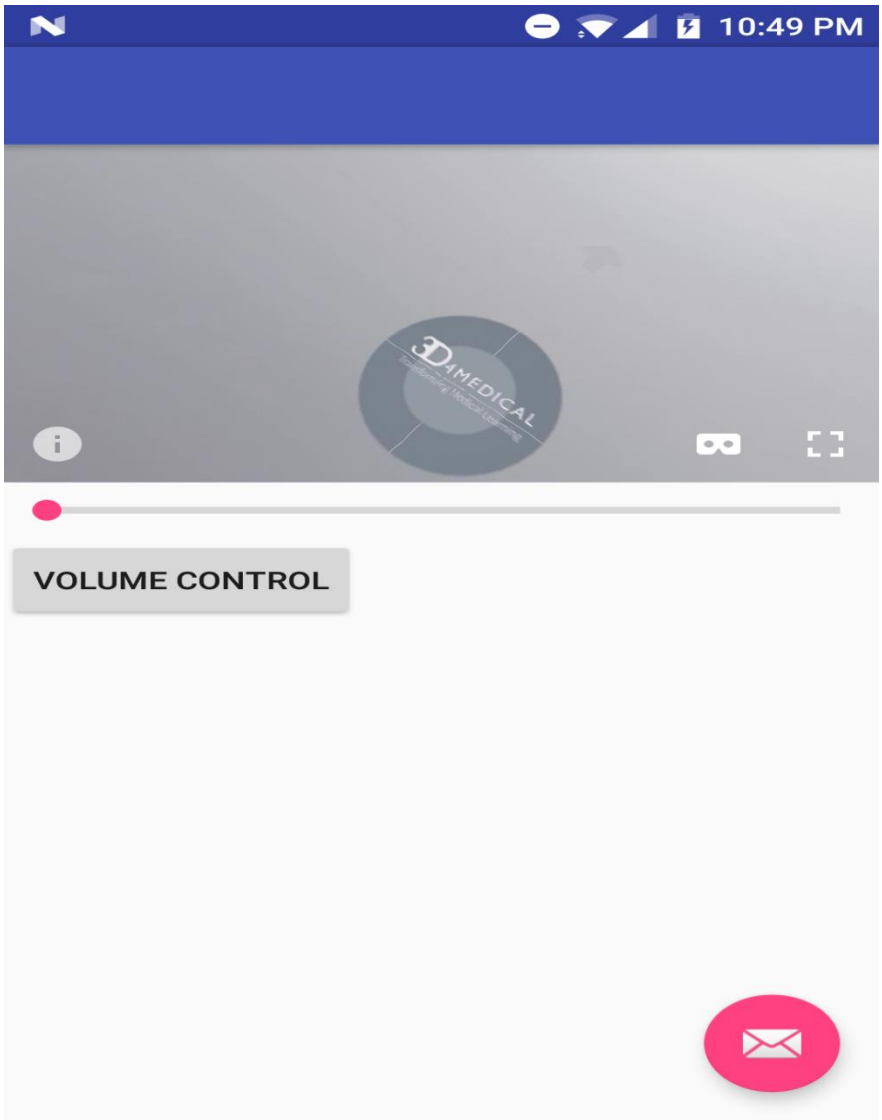
Task 2:

2.Cardboard Application:

Develop a Cardboard App that is relevant to your own project 360 Video Viewer with an additional features.

Developed the below cardboard application with 360 video. This app features Spatial audio and Head Tracking. Below screenshots are from the installed application.

Installed application on mobile



360 video

360 video