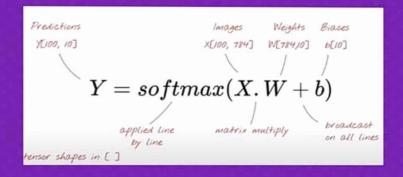
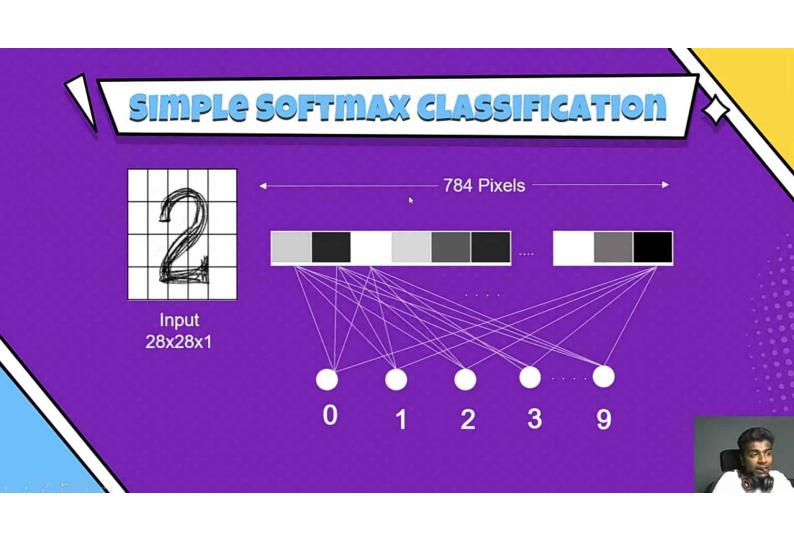


SIMPLE SOFTMAX CLASSIFICATION

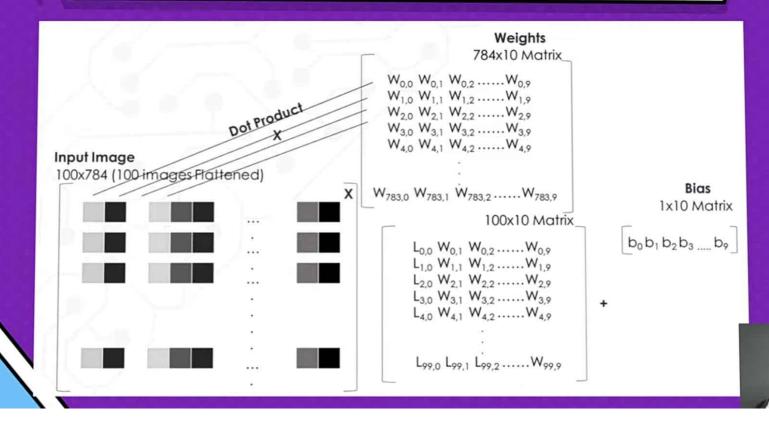
$$softmax(L_n) = rac{e^{L_n}}{||e^L||}$$

$$L = X.W + b$$

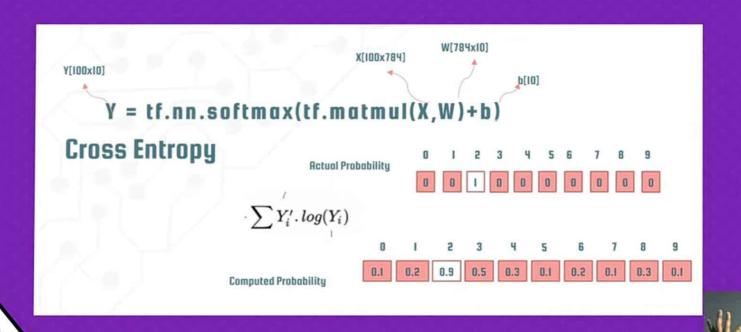




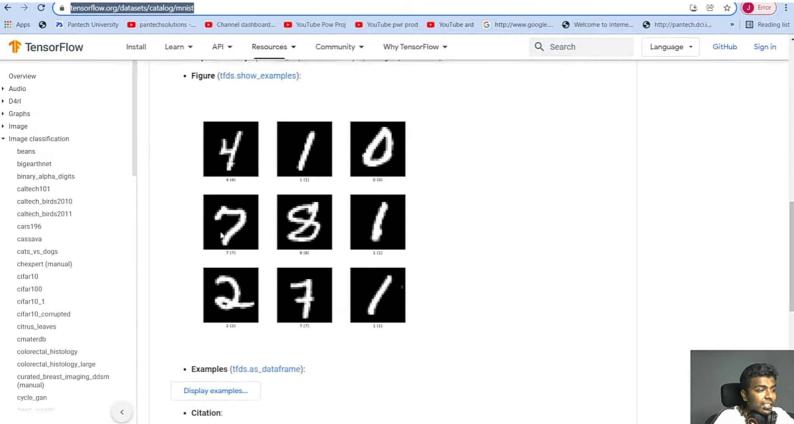
100 IMAGE AT A TIME.



in tensorflow.



CNN FOR MINIST DIGIT CLASSIFICATION



```
feom keras.datasets import mnist
from keras.utils import to_categorical
from keras.models import Sequential
from keras.layers import Conv2D, MaxPool2D, Flatten, Dense
import matplotlib.pyplot as plt

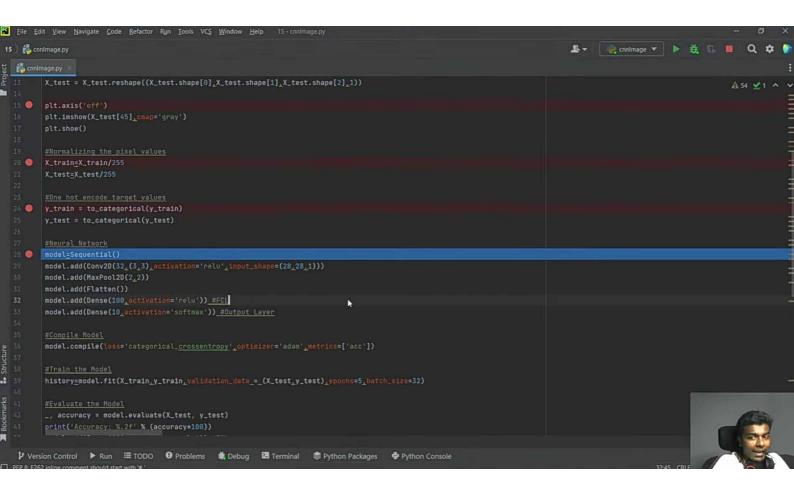
#Load Dataset
(X_train_xy_train)_, (X_test_xy_test)=mnist.load_data()

#Reshape dataset to have a single channel
X_train = X_train.reshape((X_train.shape[0], X_train.shape[1], X_train.shape[2], 1))
X_test = X_test.reshape((X_test.shape[0]_xX_test.shape[1]_xX_test.shape[2]_1))

plt.axis('off')
plt.imshow(X_test[21]_cmap='gray')
plt.show()

#Normalizing the pixel values
X_train=X_train/255
```

A 42 × 1 ^ ∨



```
plt.plot(history.history['acc'])
plt.plot(history.history['val_acc'])
plt.title('Model accuracy')
plt.ylabel('Accuracy')
plt.xlabel('Epoch')
plt.legend(['Train', 'Test'], loc='upper left')
plt.show()

plt.plot(history.history['loss'])
plt.plot(history.history['val_loss'])
plt.title('Model loss')
plt.ylabel('Loss')
plt.xlabel('Epoch')
```

#Graphical Representation of Accuracy & Loss Graph

plt.legend(['Train', 'Test'], loc='upper left')

```
plt.title('Model loss')

plt.ylabel('Loss')

plt.xlabel('Epoch')

plt.legend(['Train', 'Test'], loc='upper left')

plt.show()

#Save Model

model_json = model.to_json()

with open("model.json", "w") as json_file:

json_file.write(model_json)

model.save_weights("model.h5")

print("Saved model to disk")
```

454 ±1 ^

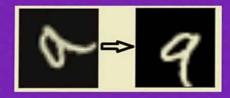
plt.plot(history.history['val_loss'])

Deep Learning Terminology - 1



Data Augmentation

- It refers to the addition of new data that come from the given data, which might prove to be beneficial for prediction.
- For example:
- Let us assume we have a digit "9". We can also change its recognition. But if it's
 rotating or tilting. Thus, rotation help to increase the accuracy of our model.
 Although, we increase the quality of data by rotating. Hence, called for Data
 Augmentation.









Bounding Box

- Bounding Box is used in object detection in which the objects are wrapped around an imaginary rectangle.
- It shows the spatial location of an object and is presented by a set of coordinates that tends to bound the object by the smallest enclosing box.

Deep Learning Terminology - 3



COCO

 It shows the spatial location of an object and is presented by a set of coordinates that tends to bound the object by the smallest enclosing box.