Assignment # 12

Hope To Skills

Free Artificial Intelligence Course

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Submission:

- Make a Google Collab notebook to implement this assignment.
- In case you face difficulty in creating the Google Collab Notebook Follow these **Steps**
- Submit a **.ipynb** file names as **HTS_Assignment_12.ipynb**
- Deadline for this Assignment is **Tuesday 29-08-2023**
- Also mention your name in the Assignment.
- Make Submission in the **Assignment-12** in Classroom and press the submit button.

Train Convolutional Neural Network on Fashion MNIST dataset 1. Dataset

a. You are provided with the fashion MNIST dataset

b. Read the description of dataset here

2. Split the data into x_train, y_train, x_test and y_test.

a. Display the sample images from **x_train**

b. Display the shape of **x_train** and **y_train**

3. Flatten the images

a. Reshape the images from **28x28** to **28x28x1**.

4. Scale the data

a. Convert the data into **float 32** type

b. Scale the data by dividing **x_train** and **y_train** by **255**

c. Display the shape of **x_train** and **y_train** after scaling.

5. Define the hyper parameters for the neural networks

a. No. of Epochs

b. Batch size

c. Input_size of image (Img_height, Img_width, No of channels)

d. No of convolutional layers

e. Output_size (output layers depending upon the number of classes)

6. Define the structure of your neural network

a. No of Convolutional layers

b. Activation function for each convolutional layer

c. Flatten the 2D vectors into 1D vector for FCN

d. Number of output layer neurons and activation function

e. Compile the model and provide following arguments

i. Loss function

ii. Optimizer

iii. Metric

f. Display the summary of the model

7. Train the Neural Network

a. Fit the Model

b. Train the Model for 15 epochs and report the training accuracy.

8. Test the model

a. Find the testing accuracy of the model

b. Compare the training and testing accuracy and write you observation in the comments

c. Display the predicted labels along the input image.