AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

MIDTERM PROJECT

COMPUTER VISION AND PATTERN RECOGNITION

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SECTION : A

Answer To the question no 3

Abstract:-

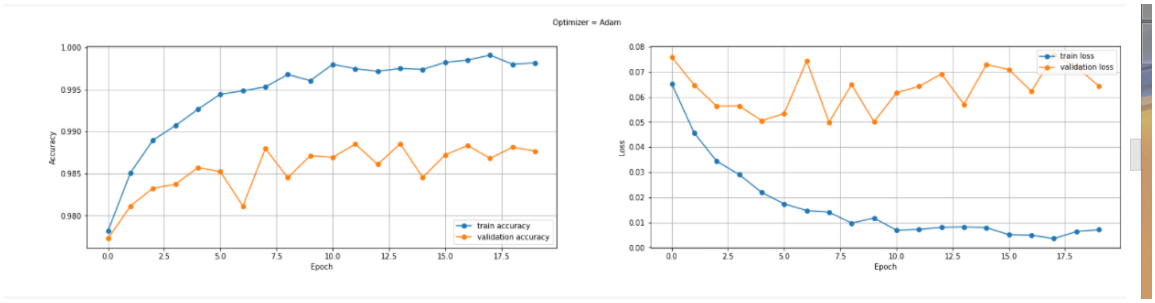
In this report, we check different optimizer accuracy (ADAM, SGD & RMSProp).

Introd uction:-

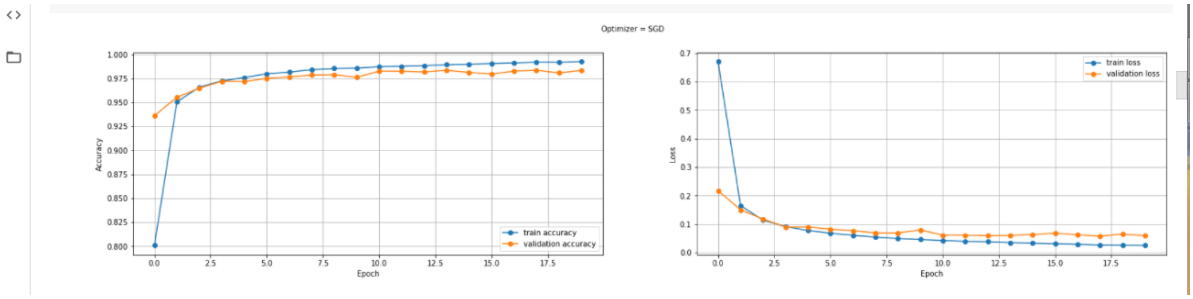
The Convolutional Neural Network(CNN) is a type of artificial neural network which is used in image processing and recognition. In CNN optimizers are the algorithms or methods used to change the attributes of your neural network such as weights and learning rate in order to reduce the losses. In the mid project I had used three types of optimizers. They are Adam, SGD. RMSprop. Optimizers are algorithms or methods used to change the attributes of your neural network such as weights and learning rate in order to reduce the losses. Optimizers help to get results faster. In this report, 3 types of optimizer are use. Their details are given below:

- Adam is a replacement optimization algorithm for stochastic gradient descent for training deep learning models. It is an extension to stochastic gradient descent that has recently seen broader adoption for deep learning applications in computer vision and natural language processing.
- Stochastic gradient descent (often abbreviated SGD) is an iterative method for optimizing an objective function with suitable smoothness properties. It's much slower than ADAM.
- RMSprop stands for Root Mean Square Propagation. It is an unpublished, yet very widely-known gradient descent optimization algorithm for mini-batch learning of neural networks.RMSprop is a gradient-based optimization technique used in training neural networks.

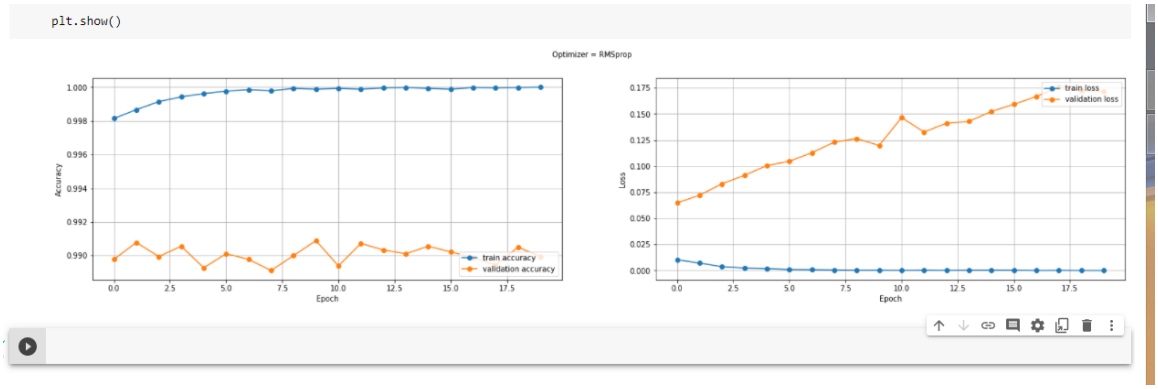
Result:-



Here is the ADAM optimizer



Here is the SGD optimizer



Here is the RMSProp optimizer and the test accuracy

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Discussion:-

In this report, I explore three types of optimizers: ADAM, SGD, and RMSProp. As a result, I discovered a slight discrepancy in their accuracy. ADAM is significantly quicker than SGD and RMSProp. Building on the capabilities of earlier models, Adam optimizer provides substantially greater performance than previously utilized models and surpasses them by a large margin in terms of providing an optimized gradient descent.