**Shreyaa Darakh**

**J009**

**B.Tech (Data Science) – 3rd Year**

**J1 Batch**

# Practical- 3

**Aim:**

To understand the various types of optimizers available.

**Observations:**

On the **MNIST dataset**, varying the different optimizers, following results were obtained:

1. With the ‘rmsprop’ optimizer accuracy was:

Test loss: 0.12339223676603855

Test accuracy: 0.9786

1. With the Stochastic Gradient Descent Optimizer accuracy was:

Test loss: 0.0888825576745996

Test accuracy: 0.9847

1. With the optimizer being RMSprop(lr=0.001, rho=0.9), accuracy is:

Test loss: 0.14086425588024185

Test accuracy: 0.9821

1. With the Adagrad optimizer, accuracy is:

Test loss: 0.1251296534857296

Test accuracy: 0.9853

1. With the Adadelta optimizer, accuracy is:

Test loss: 0.12452596562144382

Test accuracy: 0.9849

1. With the Adam optimizer, accuracy is:

Test loss: 0.10657596316647801

Test accuracy: 0.9813

1. With the Adamax optimizer, accuracy is:

Test loss: 0.10704716284478705

Test accuracy: 0.9859

1. With the Nesterov Adam Optimizer, accuracy is:

Test loss: 0.13893745962250642

Test accuracy: 0.9762

**Inference:**

The best suited optimizer for this model for MNIST dataset with 10 epochs and 3 layers is with the **Adamax Optimizer** as it is giving the best test accuracy for the model.