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**J016**

**B.Tech (Data Science) – 3rd Year**

**J1 Batch**

# Practical- 2

**Aim:**

To understand the various types of initializers available.

**Observations:**

Without any initializer, the accuracy of the model is:

loss: 1.4705 - acc: 0.4737 - val\_loss: 1.4694 - val\_acc: 0.4775

On the **CIFAR10 dataset**, varying the different initializers, following results were obtained:

1. Kernel initializer='random\_uniform' and Bias initializer='zeros' the accuracy was:

loss: 1.4634 - acc: 0.4743 - val\_loss: 1.4475 - val\_acc: 0.4816

1. Kernel initializer='ones' and Bias initializer='ones' the accuracy was:

loss: 14.5063 - acc: 0.1000 - val\_loss: 14.5063 - val\_acc: 0.1000

1. Kernel and Bias initializer where it is a constant value= 0, the accuracy was:

loss: 2.3027 - acc: 0.0958 - val\_loss: 2.3026 - val\_acc: 0.1000

1. Kernel and Bias initializer = RandomNormal(mean=0, std dev.= 0.05, seed= None), the accuracy was:

loss: 1.4554 - acc: 0.4794 - val\_loss: 1.4830 - val\_acc: 0.4741

1. Kernel and Bias initializer = RandomUniform(minval=0.05, maxval= 0.05, seed= None), the accuracy was:

loss: 1.4636 - acc: 0.4762 - val\_loss: 1.4814 - val\_acc: 0.4710

1. Kernel and Bias initializer= TruncatedNormal(mean=0, std dev.= 0.05, seed= None), the accuracy was:

loss: 1.4460 - acc: 0.4815 - val\_loss: 1.5085 - val\_acc: 0.4700

1. Accuracy when Kernel and Bias initializer = VarianceScaling(scale=1.0, mode='fan\_in', distribution='normal', seed=None):

loss: 1.4478 - acc: 0.4826 - val\_loss: 1.4523 - val\_acc: 0.4832

1. Accuracy where initializer= Orthogonal(gain=2.0, seed=None):

loss: 1.5397 - acc: 0.4501 - val\_loss: 1.5481 - val\_acc: 0.4472

1. Accuracy where initializer= Identity(gain=1.0):

loss: 1.8221 - acc: 0.3359 - val\_loss: 1.8010 - val\_acc: 0.3381

1. Accuracy where initializer= lecun\_uniform(seed=None):

loss: 1.4538 - acc: 0.4795 - val\_loss: 1.4807 - val\_acc: 0.4693

1. Accuracy where initializer= glorot\_normal(seed=None):

loss: 1.4664 - acc: 0.4766 - val\_loss: 1.4733 - val\_acc: 0.4670

1. Accuracy where initializer= glorot\_uniform(seed=None):

loss: 1.4542 - acc: 0.4784 - val\_loss: 1.4645 - val\_acc: 0.4733

1. Accuracy where initializer= he\_normal(seed=None):

loss: 1.4530 - acc: 0.4806 - val\_loss: 1.5156 - val\_acc: 0.4537

1. Accuracy where initializer= lecun\_normal(seed=None):

loss: 1.4480 - acc: 0.4787 - val\_loss: 1.4769 - val\_acc: 0.4686

1. Accuracy where initializer= he\_uniform(seed=None):

loss: 1.4576 - acc: 0.4758 - val\_loss: 1.4466 - val\_acc: 0.4833

**Inference:**

The best suited initializer for this model for CIFAR10 dataset with 5 epochs and 8 layers is with the **Variance Scaling** as it is giving the best accuracy for the model as well as validation.