

## Assignment -4

PROJECT NAME	A NOVEL METHOD FOR HANDWRITTEN DIGIT RECOGNITION SYSTEM
TEAM ID	PNT2022TMID17271
ROLL NO	319UCS059
MARKS	2 MARKS

## Application

## Data

```
public class LabeledImage implements Serializable {  
  
    private double label;  
  
    private Vector features;  
  
    public LabeledImage(int label, double[] pixels) {  
  
        this.label = label;  
  
        features = Vectors.dense(pixels);  
  
    }  
  
    public Vector getFeatures() {  
  
        return features;  
  
    }  
  
    public double getLabel() {  
  
        return label;  
  
    }  
  
    public void setLabel(double label) {
```

```
        this.label = label;

    }

}
```

## Configure Neural Network

```
public void train(Integer trainData, Integer testFieldValue) {

    initSparkSession();

    List<LabeledImage> labeledImages = IdxReader.loadData(trainData);

    List<LabeledImage> testLabeledImages = IdxReader.loadTestData(testFieldValue);

    Dataset<Row> train = sparkSession.createDataFrame(labeledImages,
LabeledImage.class).checkpoint();

    Dataset<Row> test = sparkSession.createDataFrame(testLabeledImages,
LabeledImage.class).checkpoint();

    //in=28x28=784, hidden layers (128,64), out=10

    int[] layers = new int[]{784, 128, 64, 10};

    MultilayerPerceptronClassifier trainer = new MultilayerPerceptronClassifier()

        .setLayers(layers)
```

```
.setBlockSize(128)

.setSeed(1234L)

.setMaxIter(100);

model = trainer.fit(train);

evalOnTest(test);

    evalOnTest(train);

}
```

