Assignment -4

PROJECT NAME	**A NOVEL METHOD FOR HANDWRITTEN DIGIT RECOGNITION SYSTEM**
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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);

}
```