**Problem Statement**

**Business Understanding**

A classic problem in the field of pattern recognition is that of **handwritten digit recognition**. Suppose that you have an image of a digit submitted by a user via a scanner, a tablet, or other digital devices. The goal is to develop a model that can correctly identify the digit (between 0-9) written in an image.

**Objective**

You are required to develop a model using Support Vector Machine which should correctly classify the **handwritten digits** based on the **pixel values given as features**.

**Results Expected**

1. Write all your code in one well-commented R file; briefly, mention the insights and observations from the analysis.

You need to submit the only the **R commented file.** It should include detailed comments and should not contain unnecessary pieces of code.

**Downloads:**

For this problem, we use the **MNIST data** which is a large database of handwritten digits where we have pixel values of each digit along with its label.

**Note:**

It would take a lot of time for modeling on the full MNIST data, So you can sample the data and build the model which would make the computation faster.

**Packages required (Suggested):**

install.packages(“caret”)

install.packages(“kernlab”)

install.packages(“dplyr”)

install.packages(“readr”)

install.packages(“ggplot2”)

install.packages(“gridExtra”)