Project Design Phase-I
Proposed Solution Template

Date	24 September 2022
Team ID	PNT2022TMID12666
Project Name	Project - A Novel Method for Handwritten Digit Recognition System
Maximum Marks	2 Marks

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The handwritten digit recognition is the capacity of computer applications to perceive human handwritten digits. It is a hard undertaking for the machine in light of the fact that handwritten digits are noticeably flawed and can be made with various shapes and sizes. The handwritten digit recognition framework is a method for handling this issue which utilizes the picture of a digit and perceives the digit present in the picture. Convolutional Neural Network model is made utilizing PyTorch library over the MNIST dataset to perceive handwritten digits.
2.	Idea / Solution description	MNIST database consists of 60,000 training images of handwritten digits from zero to nine furthermore, 10,000 images for testing. We will make our CNN model. It works better for data that are addressed as lattice structures; this is the justification for why CNN functions admirably for image classification problems.
3.	Novelty / Uniqueness	Handwritten digit recognition utilizing MNIST dataset is a significant undertaking made with the assistance of neural networks. It essentially distinguishes the scanned pictures of handwritten digits. We have made this a stride further where a handwritten digit recognition framework not just distinguishes the scanned pictures of handwritten digits yet additionally permits writing digits on the screen with the assistance of an Integrated GUI for recognition.
4.	Social Impact / Customer Satisfaction	Digital Recognition isn't anything other than perceiving or distinguishing digits in any report. The system of digital recognition is just the activity of the machine to plan or decipher digits. Handwritten Digit Recognition is the power of computers to interpret handwritten digits from an assortment of sources, for example, instant messages, bank checks, papers, photographs, and so forth strategy.

		With the utilization of in-depth learning methods, human endeavors can be diminished in perception, learning, perception and in such a large number of locales. Involving in-depth learning, the computer figures out how to carry out particular roles in pictures or content anyplace precision, notwithstanding the execution of the human level. The digital recognition model uses huge informational collections to distinguish digits from various sources.
5.	Business Model (Revenue Model)	Handwritten digit recognition alludes to a model's (machine's) ability to recognize any handwritten digits from different sources, such as photos, papers, and contact shows, what's more, group them into ten indicated classifications 0-9. Multiple ways and calculations are utilized to perceive handwritten digits, like Profound Learning/CNN, SVM (Backing Vector Machine), Gaussian Gullible Bayes, KNN (K-Closest Neighbor), Choice Trees, Irregular Timberlands, and so forth. We utilized the CNN (Convolutional Neural network) calculation to perceive handwritten digits in this project.
6.	Scalability of the Solution	The varieties of accuracies for handwritten digit were noticed for 15 epochs by fluctuating the hidden layers utilizing CNN model and MNIST digit dataset. The most extreme accuracy in the presentation was found 99.64% and the absolute least test misfortune is 0.0239 roughly. This innovation will likewise stretch out to perceiving the characters from now on.