

## PROJECT DESIGN PHASE-II

### SOLUTION REQUIREMENTS (FUNCTIONAL & NON FUNCTIONAL)

Date	10 October 2022
Team ID	PNT2022TMID27796
Project Name	A novel method for handwritten digit recognition
Maximum Marks	4 Marks

#### FUNCTIONAL REQUIREMENTS:

Following are the functional requirements of the proposed solution.

FR No.	Functional requirement	Sub Requirement (Story / Sub-Task)
<b>FR-1</b>	IMAGE DATA	Handwritten digit recognition refers to a computer's capacity to identify human handwritten digits from a variety of sources, such as photographs, documents, touch screens, etc., and categorise them into ten established classifications (0-9). In the realm of deep learning, this has been the subject of countless studies.
<b>FR-2</b>	WEBSITE	Web hosting makes the code, graphics, and other items that make up a website accessible online. A server hosts every website you've ever visited. The type of hosting determines how much space is allotted to a website on a server. Shared, dedicated, VPS, and reseller hosting are the four basic varieties.
<b>FR-3</b>	DIGIT CLASSIFIER MODEL	To train a convolutional network to predict the digit from an image, use the MNIST database of handwritten digits get the training and validation data first.
<b>FR-4</b>	CLOUD	The cloud offers a range of IT services, including virtual storage, networking, servers, databases, and applications. In plain English, cloud computing is described as a virtual platform that enables unlimited storage and access to your data over the internet.
<b>FR-5</b>	MNIST DATASET	The abbreviation MNIST stands for Modified National Institute of Standards and Technology dataset. It is a collection of 60,000 tiny square grayscale photographs, each measuring 28 by 28, comprising handwritten single digits between 0 and 9.

## NON-FUNCTIONAL REQUIREMENTS:

Following are the non-functional requirements of the proposed solution.

FR No	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	One of the very significant problems in pattern recognition applications is the recognition of handwritten characters. Applications for digit recognition include filling out forms, processing bank checks, and sorting mail.
NFR-2	<b>Security</b>	1) The system generates a thorough description of the instantiation parameters, which might reveal information like the writing style, in addition to a categorization of the digit. 2) The generative models are capable of segmentation driven by recognition. 3) The procedure uses a relatively.
NFR-3	<b>Reliability</b>	The samples are used by the neural network to automatically deduce rules for reading handwritten digits. Furthermore, the network may learn more about handwriting and hence enhance its accuracy by increasing the quantity of training instances. Numerous techniques and algorithms, such as Deep Learning/CNN, SVM, Gaussian Naive Bayes, KNN, Decision Trees, Random Forests, etc., can be used to recognize handwritten numbers.
NFR-4	<b>Accuracy</b>	With typed text in high-quality photos, optical character recognition (OCR) technology offers accuracy rates of greater than 99%. However, variances in spacing, abnormalities in handwriting, and the variety of human writing styles result in less precise character identification.
NFR-5	<b>Availability</b>	Available for mobile and web browsers
NFR-6	<b>Scalability</b>	The scalability in the task of handwritten digit recognition using a classifier has a great importance and it makes use of online handwriting recognition on computer tablets , recognizing zip codes on mail for postal mail sorting , processing bank check amounts numeric entries in forms filled up manually (for example tax forms )and so on