A. No. : 3 **Handwritten character recognition using neural networks**

Download the handwritten character recognition dataset from the link given below:

https://www.kaggle.com/datasets/dhruvildave/english-handwritten-characters-dataset

This dataset contains 3,410 images of handwritten characters in English. This is a classification dataset that can be used for Computer Vision tasks. It contains 62 classes with 55 images of each class. The 62 classes are 0-9, A-Z and a-z.

Develop a python program to recognize the handwritten characters using Neural Network (NN) Model. Visualize the features from the dataset and interpret the results obtained by the model using Matplotlib library. **[CO1, K3]**

Use the following steps to do implementation:

1. Loading the dataset.
2. Pre-processing the data (Handling missing values, Encoding, Normalization, Standardization).
3. Exploratory Data Analysis.
4. Feature Engineering techniques.
5. Split the data into training, testing and validation sets.
6. Train the model.
7. Test the model.
8. Measure the performance of the trained model.
9. Represent the results using graphs.