

# Prior Knowledge

Team ID	PNT2022TMID07944
Project Name	A Novel Method for Handwritten Digit Recognition System

**One should have knowledge on the following Concepts :**

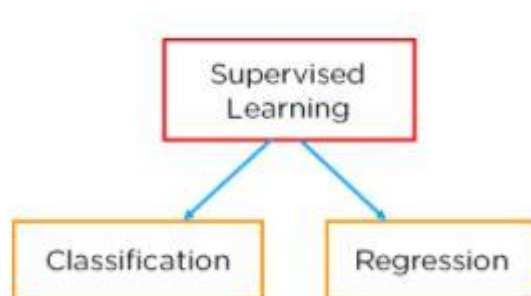
**Supervised and unsupervised learning:**

**Supervised learning:**

Supervised learning, also known as supervised machine learning, is a subcategory of machine learning and artificial intelligence. It is defined by its use of labeled datasets to train algorithms that to classify data or predict outcomes accurately.

**Unsupervised learning:**

Unsupervised learning, also known as [unsupervised machine learning](#), uses machine learning algorithms to analyze and cluster unlabeled datasets. These algorithms discover hidden patterns or data groupings without the need for human intervention. Its ability to discover similarities and differences in information make it the ideal solution for exploratory data analysis, cross-selling strategies, customer segmentation, and image recognition.



## Regression Classification and Clustering :

### Classification:

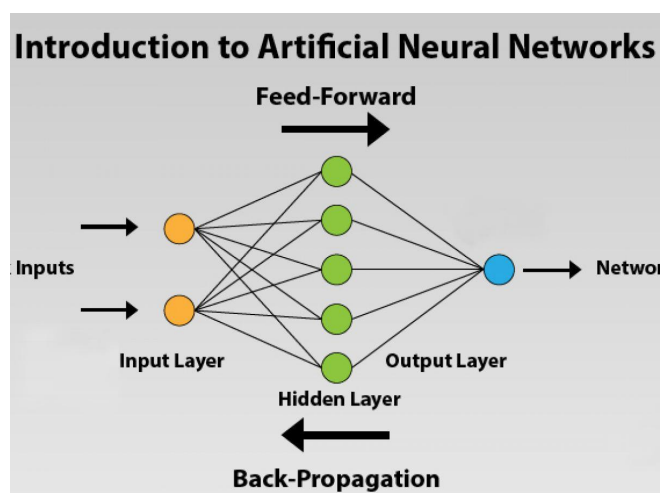
Classification is defined as the process of recognition, understanding, and grouping of objects and ideas into preset categories a.k.a “sub-populations.” With the help of these pre-categorized training datasets, classification in machine learning programs leverage a wide range of algorithms to classify future datasets into respective and relevant categories.

### Clustering :

It is the task of dividing the population or data points into a number of groups such that data points in the same groups are more similar to other data points in the same group and dissimilar to the data points in other groups. It is basically a collection of objects on the basis of similarity and dissimilarity between them.

### Artificial Neural Networks:

An artificial neural network is an interconnected group of nodes, inspired by a simplification of neurons in a brain. Here, each circular node represents an artificial neuron and an arrow represents a connection from the output of one artificial neuron to the input of another.



## **Convolution Neural Networks :**

Convolutional neural networks are distinguished from other neural networks by their superior performance with image, speech, or audio signal inputs. They have three main types of layers, which are:

- Convolutional layer
- Pooling layer
- Fully-connected (FC) layer

The convolutional layer is the first layer of a convolutional network. While convolutional layers can be followed by additional convolutional layers or pooling layers, the fully-connected layer is the final layer. With each layer, the CNN increases in its complexity, identifying greater portions of the image. Earlier layers focus on simple features, such as colors and edges. As the image data progresses through the layers of the CNN, it starts to recognize larger elements or shapes of the object until it finally identifies the intended object.

## **Flask :**

Flask is a web application framework written in Python. Flask is based on the Werkzeug WSGI toolkit and Jinja2 template engine. Both are Pocco projects. This article revolves around **how to deploy a flask app on Heroku**. To demonstrate this, we are first going to create a sample application for a better understanding of the process.

## **Command:**

```
pip install flask
```