

# Minor Project

- **Project Name:**

Artificial Intelligence January Minor Project

- **Project Description:**

**Problem statement:** Create a Deep learning model to predict the different Fashion clothing accessories.

- Context: Fashion-MNIST is a dataset of Zalando's article images—consisting of a training set of 60,000 examples and a test set of 10,000 examples. Each example is a 28x28 grayscale image, associated with a label from 10 classes. Zalando intends Fashion-MNIST to serve as a direct drop-in replacement for the original MNIST dataset for benchmarking machine learning algorithms. It shares the same image size and structure of training and testing splits.
- Each image is 28 pixels in height and 28 pixels in width, for a total of 784 pixels in total. Each pixel has a single pixel-value associated with it, indicating the lightness or darkness of that pixel, with higher numbers meaning darker. This pixel-value is an integer between 0 and 255. The training and test data sets have 785 columns. The first column consists of the class labels (see above), and represents the article of clothing. The rest of the columns contain the pixel-values of the associated image.

- **Dataset can be downloaded as follows**

```
from tensorflow.keras.datasets import fashion_mnist
```

```
(x_train, x_test), (y_train, y_test) = fashion_mnist.load_data()
```

**Details of datasets:**

Each training and test example is assigned to one of the following labels:

- 0 T-shirt/top
- 1 Trouser
- 2 Pullover
- 3 Dress
- 4 Coat
- 5 Sandal
- 6 Shirt
- 7 Sneaker
- 8 Bag
- 9 Ankle boot

**Steps to consider:**

1. Normalize images by dividing pixels by 255 (if required)
2. Convert labels to categories (if required)
3. Build a CNN Architecture.
4. Execute the model for appropriate number of epochs
5. Depict loss vs. val\_loss on line chart
6. Depict accuracy vs. val\_accuracy on line chart.
7. Generate predictions on test\_data
8. Compute Confusion matrix and classification report