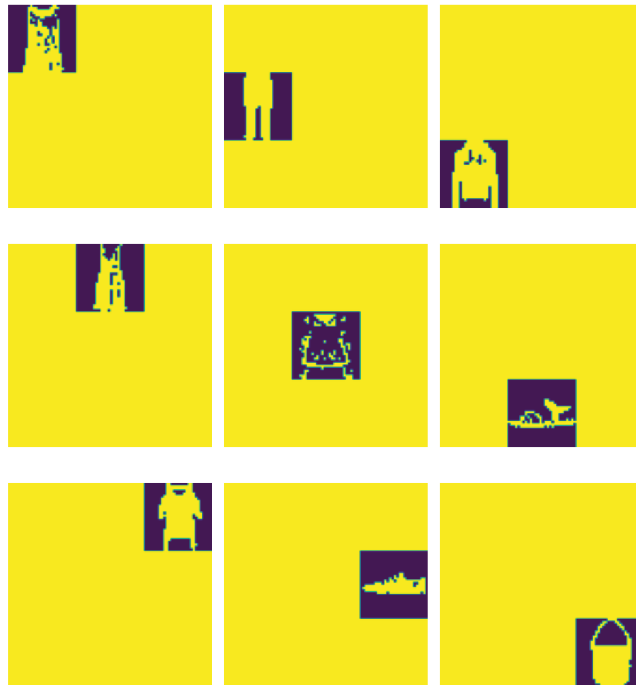


Coursework 3

Hopfield Network

Implementation of Hopfield network is provided to reconstruct two noisy images. You can modify this code for the following tasks:

1. Initialize a 2D array by ones with 84x84 dimension using Mnist-Fashion database. Divide this array into 9 parts. Put each image of T-shirt, Trouser, ... to bag (corresponding classes of 0 to 8, respectively) in a different part of this image to prepare 9 images. An example of the images is shown below. **(Upload upto this part for in class exercise bonus)** Use the auto-associative memory network to map each image to itself. Test the network with noised versions of the images, sweep noise variation from 0.2 to 2.0 in 0.3 steps.



2. Use the images that are prepared in the previous section, in a hetero-associative memory network for mapping each image to another image. Initialize the weights in a way that the network predicts images in an incremental order in their classes. For example, by providing Sandal (class 5) to the network, outputs of the network are Shirt, Sneaker, Bag, T-shirt, Trouser, Pullover, Dress, Coat, and Sandal (with classes 6,7,8,0,1,2,3,4,5, ...) respectively one by one at each one of 9 steps. Demonstrate its operation by starting with the T-shirt.