Assignments due on 21/04/2022

Reference: “SEMI-SUPERVISED CLASSIFICATION WITH GRAPH CONVOLUTIONAL NETWORKS” Kipf and Welling, ICLR 2017

Assignment 8a.

a) In this assignment, we will implement graph convolutional network for node classification task
b) Download CORA dataset. It has a number of nodes. Each node has 1433 binary features corresponding to some vocabulary. The nodes are from 7 classes.
c) You should use 60% nodes for training, 20% for validation, and 20% for testing.
d) You need to use three layers of graph convolution. The first layer will have embedding of size 64. The second layer will have 128 length of embedding. The third layer will have the embedding size of 64.
e) Then use two FC layers and a softmax layer to classify the nodes into 7 classes.
f) Use cross entropy loss for the labelled nodes during the training.
g) Run atleast 100 epochs. Plot training loss and validation loss for 100 epochs.
h) After completing the training, you should feed the test nodes and the Adjacency matrix for testing. Calculate accuracy, F1 score.
i) For training nodes, you should plot 2D t-SNE with the 3rd layer embedding (3rd GCN layer) with different colors for different classes.

Assignment 8b.

a. In this assignment, we will use 3 layer simple neural network with a softmax layer for 7 classes. The input will have 1433 neurons to feed the node features directly. The hidden layers will have 64, 128, and 64 neurons.
b. Train this neural network with the same 60% training nodes. Use cross entropy loss.
c. Plot train and validation loss.
d. Perform test on test nodes. Compute f1 score and accuracy.
e. you should plot 2D t-SNE with the 3rd layer (3rd layer neurons) with different colors for different classes.