**DL LAB 06 – GNN**

1. Increase the N value from 20 (original value) to 200 with multiple N values in between and observe the change of graph density and degree distribution (i.e., histogram plot). Explain what you observe and write the answer in a word file.   
   Answer:

* The graph density stabilizes at around **0.5** as NNN increases, which suggests a relatively stable edge probability for larger graphs.
* The degree distribution becomes more normal and consistent with larger NNN, showing less variability in node degrees as the graph grows larger. The graph becomes more uniform with higher NNN values.

1. Explain the differences between supervised learning, self-supervised learning and semi-supervised learning methods

Answer: **Supervised learning** relies heavily on labeled data, **self-supervised learning** generates labels from the data itself, and **semi-supervised learning** uses a mix of labeled and unlabeled data.

1. Explain the differences between transductive learning and inductive learning.

Answer: **Transductive learning** focuses on the specific test data during training, whereas **inductive learning** aims to generalize and make predictions on unseen future data.

1. Increase the number of epochs from 50 to 500 and observe the change in validation accuracy and write what you observe in the word file.  
   Answer: As the number of epochs increased from 50 to 500, the training accuracy steadily improved from 25% to 100%. The validation accuracy also increased significantly, from 35.29% to 82.35%. This shows that the model has learned the training data well, and generalization to the validation set improved as training progressed.