Advanced deep learning lab 3

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28th January 2025

1 Task 1

Each node of the graph can have $n-1$ edges. Each of these edges has a probability p of being in the graph and these events are independent. Therefore the expected degree of a node is $(n-1)p$.

For $n = 15$ and $p = 0.1$, the expected degree is 1.4. For $n = 15$ and $p = 0.4$, the expected degree is 5.6.

2 Task 2

Trainable linear layers are seldom used in GNNs due to their lack of permutation invariance. Since the order of nodes in a graph is arbitrary, it is important that the same graph input, even if reordered, produces consistent results for better performance.

3 Task 3

$Sum = (2.6, 5.4, 4.6)$. $Mean = (0.867, 1.35, 2.3)$. $Max = (1.31, 1.31, 1.31)$.

The most distinct representation is achieved with the sum function.

4 Task 4

We can use the following graphs :

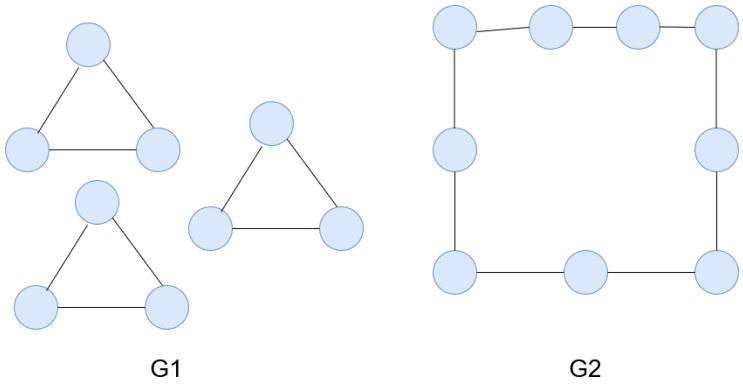

Figure 1: Caption