Lab-4

Goutam Halder

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1 Economic Stabilization Act

In March 2006, Congress raised the debt ceiling by an additional $0.79 trillion to $8.97 trillion, which was approximately 68% of GDP. As of October 4, 2008, the *Emergency Economic Stabilization Act of 2008* raised the current debt ceiling to $11.3 trillion.

2 Mathematical Expressions

The equations from the research paper *The Loss Surfaces of Multilayer Networks* are as follows:
Equation (2):

$$h_k^v \leftarrow \sigma\left(W \cdot \text{MEAN}\left(\{h_{k-1}^v\} \cup \{h_{k-1}^u, \forall u \in N(v)\}\right)\right) \tag{1}$$

Equation (3):

$$\text{AGGREGATEpool}_k = \max\left(\{\sigma(W_{\text{pool}} h_k^{ui} + b), \forall ui \in N(v)\}\right) \tag{2}$$

Equation 1 represents the mean aggregator used in the GraphSAGE algorithm. It applies a non-linear activation function σ to the weighted mean of a node's previous layer representation h_{k-1}^v and its neighbors' representations h_{k-1}^u. This method aggregates neighborhood information to update the node's representation, akin to localized spectral convolution, but without performing concatenation operations.
Equation 2 describes the pooling aggregator in the GraphSAGE algorithm. Each neighbor's representation is transformed using a neural network and aggregated via element-wise max-pooling. This method captures diverse features from the neighborhood set using a non-linear activation σ and can utilize various symmetric functions like mean-pooling.

3 Image

Figure 1: Peacock feather

The above figure 1 is an image of a beautiful peacock feather captured on a rainy day.

4 Education Qualifications

Degree	Name of School/College	Marks in Percentage	Year of Passing
B.Tech	Indian Institute of Information Technology, Bhagalpur	72.5%	2022
M.Tech	Indian Institute of Technology, Bhilai	90%	2026

Table 1: Educational Qualifications of Goutam Halder

The table 1 lists my education qualifications, including the institutions, marks obtained, and years of completion.

As described by Ying et al. [2], graph convolutional networks are suitable for large-scale recommender systems. Similarly, the work of Leskovec and Faloutsos [1] addresses efficient sampling techniques from large graphs.

References

[1] Jure Leskovec and Christos Faloutsos. Sampling from large graphs. *Proceedings of the 12th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pages 631–636, 2006.

[2] Rex Ying, Ruining He, Kaifeng Chen, Pim Eksombatchai, William Hamilton, and Jure Leskovec. Graph convolutional neural networks for web-scale recommender systems. In *Proceedings of the 24th International Conference on Knowledge Discovery and Data Mining*, 2018.