Node Classification Workflow

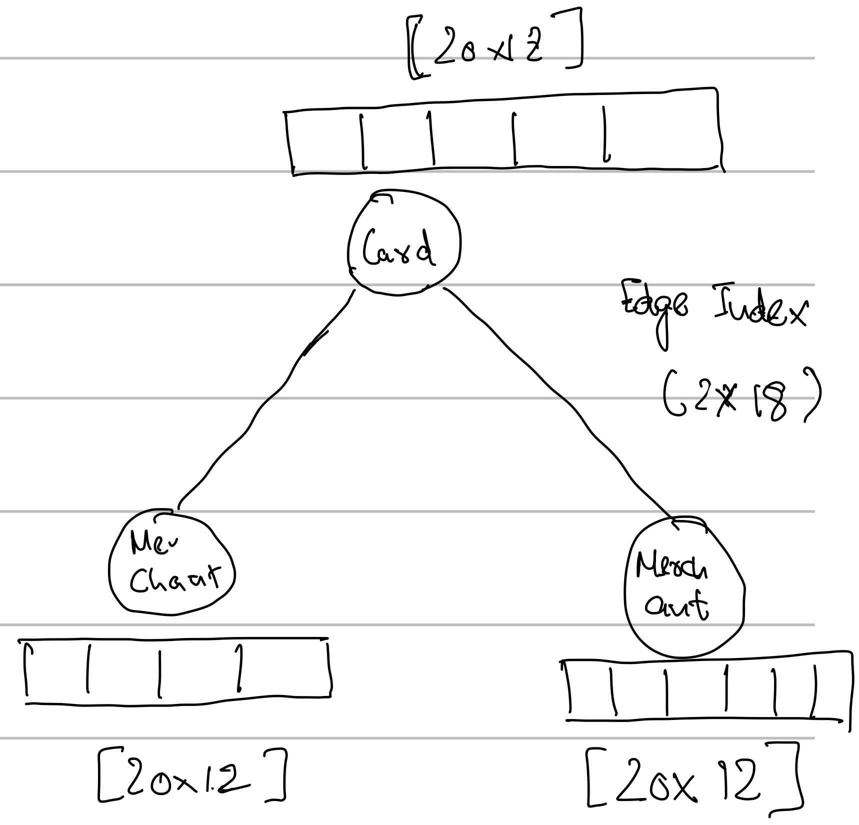
10 Data Points (5 for fraud, 5 for non fraud)

Data Object: Node features $x = [20, 12]$

Edge Index $= [2, 18]$

Labels $y = [20]$

Updated node features: $x' = AXW$



First layer of convolution

Node features, $x = [N \times D] = [20 \times 12]$

Weight matrix, $W_i = [12 \times 8]$

Adjacency matrix, $A = [20 \times 20]$ → Resulting matrix $= [20 \times 8]$

Second layer

Resulting matrix from first layer $= [20 \times 8]$

Weight matrix $= [8 \times 2]$

Resulting matrix $= [20 \times 2]$

Linear Classifier Final Embedding

$[20 \times 2] * [2 \times 1] = [20 \times 1]$

↘ (Applying Sigmoid to get the labels)

Updating node embeddings in first layer

$$X' = AXW$$

$$= \begin{bmatrix} & \\ & \end{bmatrix}_{20\times20} \begin{bmatrix} & \\ & \end{bmatrix}_{20\times12} \begin{bmatrix} & \\ & \end{bmatrix}_{12\times8}$$

$$= \begin{bmatrix} \quad \end{bmatrix}_{20 \times 8}$$

Diagram: