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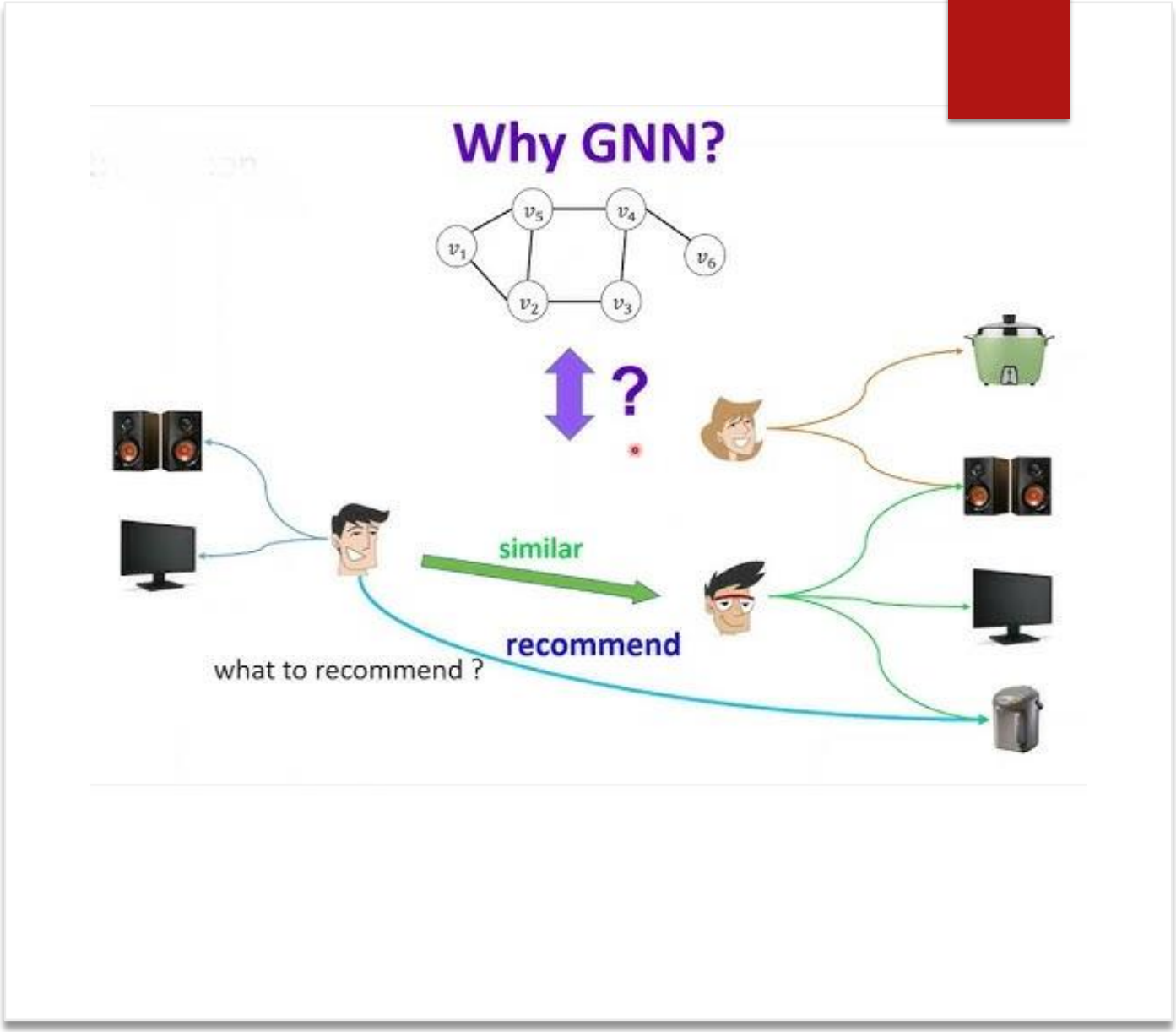
“GRAPH NEURAL NETWORK(GNN) BASED MULTIMODAL RECOMMENDATION SYSTEM”

Introduction

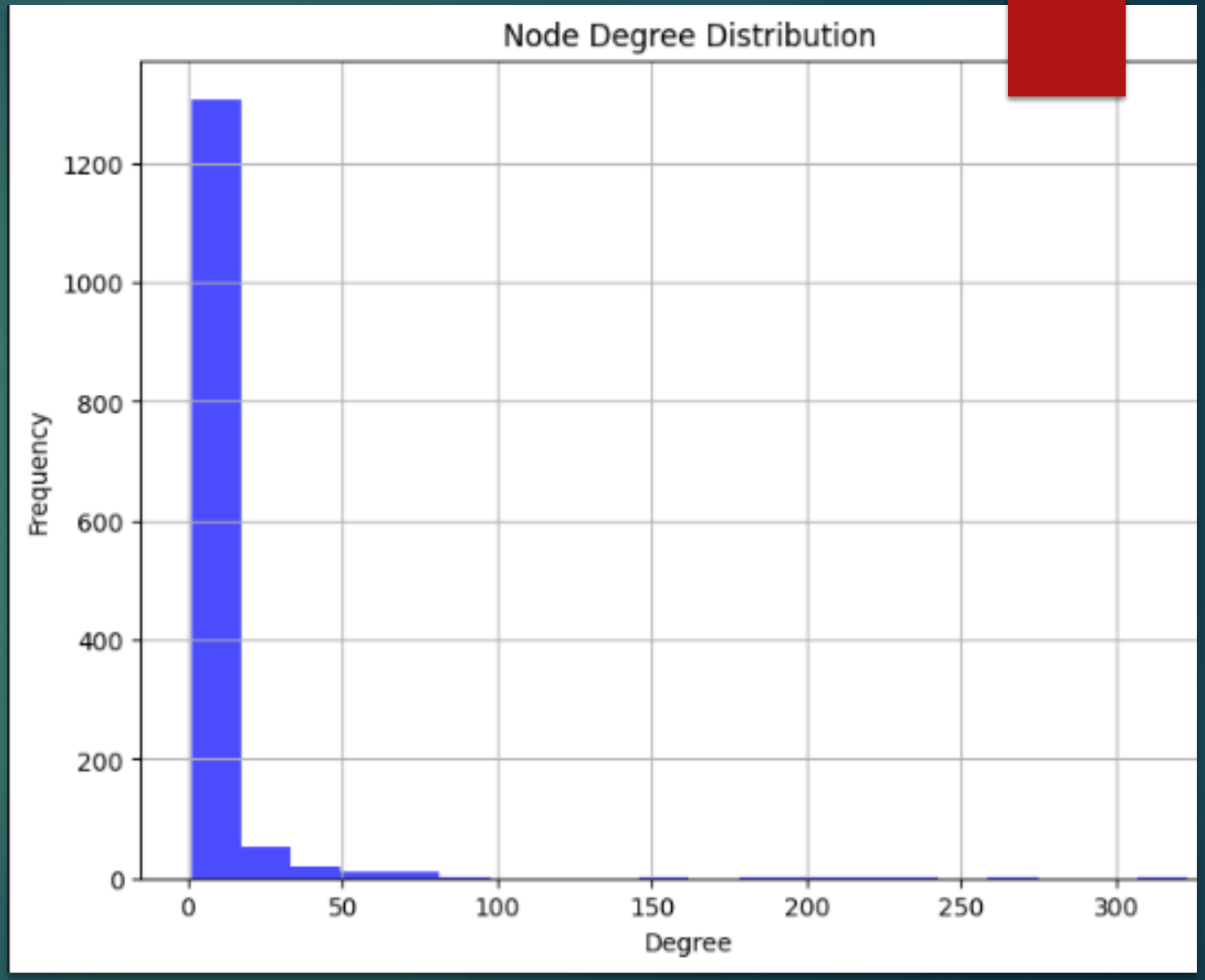
- Personalized recommendations are hard due to information overload and limitations of traditional methods.
- Utilize Graph Neural Networks (GNNs) in a multimodal framework.
- Integrate numerical, and categorical data for better insights.
- Beautylish dataset: 70,000 reviews, ratings, and metadata.
- Use GNN architectures to predict user preferences.

- Sparse data handling.
- Information Propagation to handle Cold Start Problem.
- Multi-hop relationships.

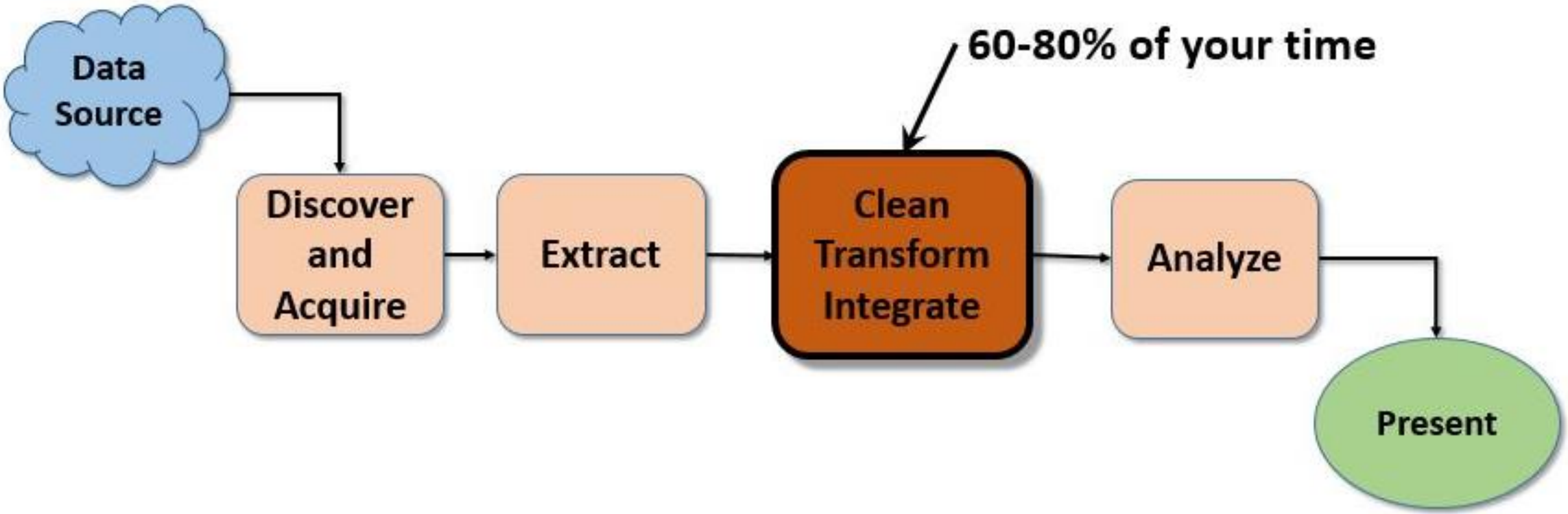


Dataset Overview

- Transactional csv dataset.
- Users and Products acting as nodes whilst ratings act as the edge between them.

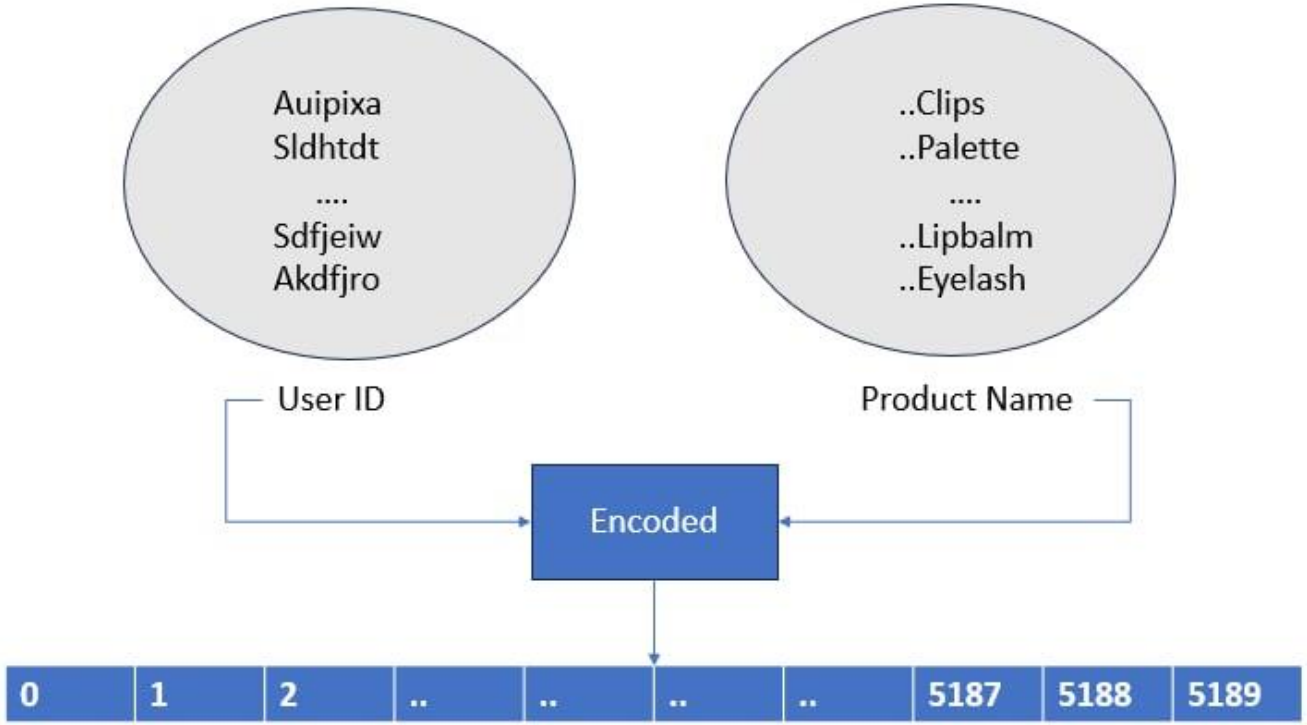


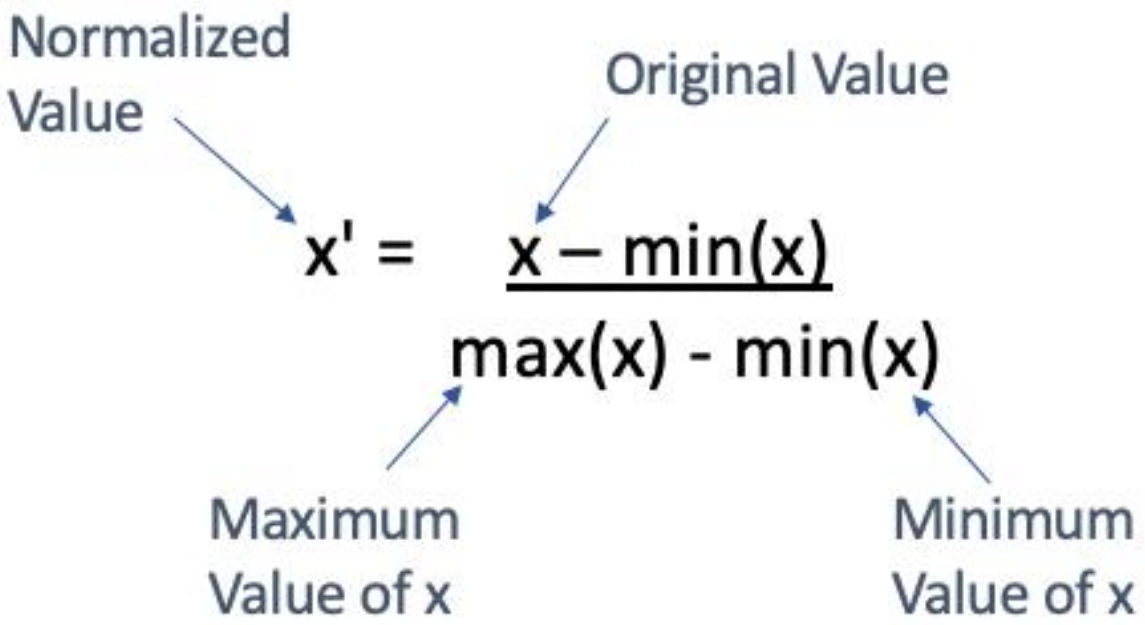
Data Processing Pipeline



Martin Magdinier, RefinePro

Data Encoding





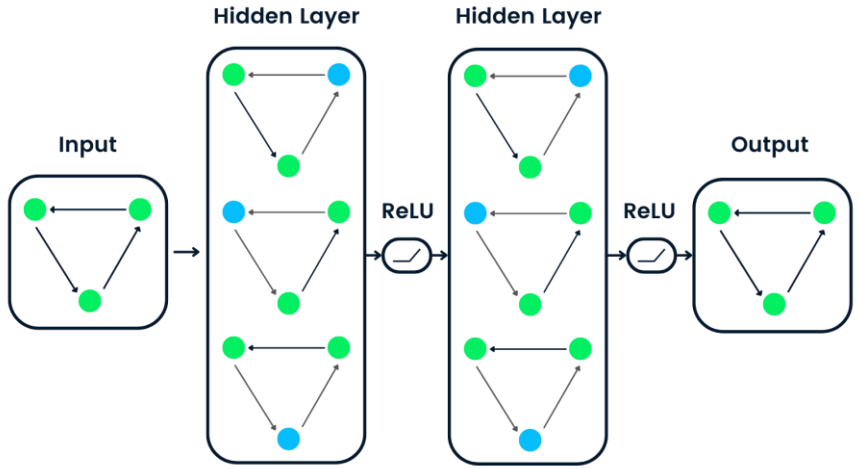
Data Normalization

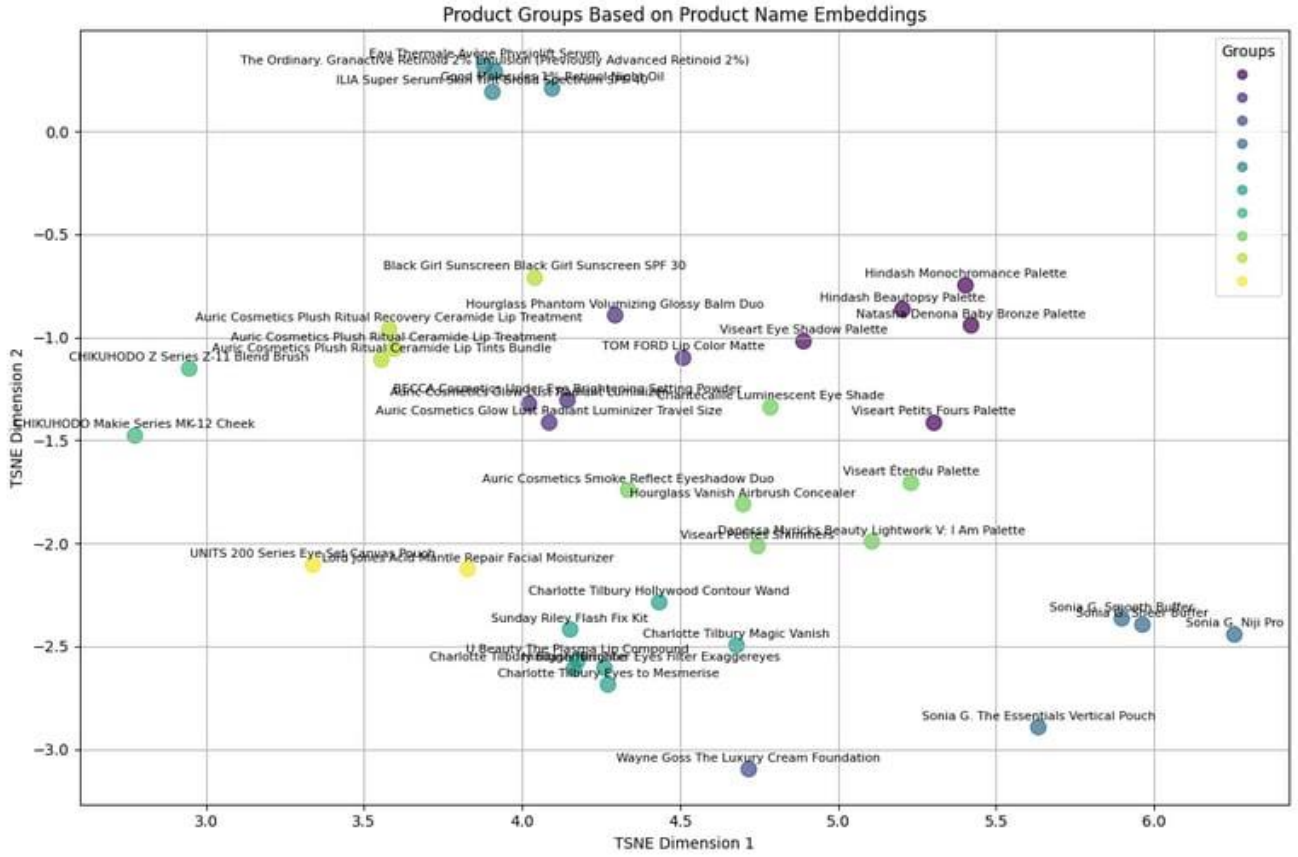
Natural Language Processing(Bert Embedding)

Model Architecture

- Feature Matrix of User nodes and Product nodes as input.
- The GNN uses the following layers:

1. Graph Convolutional Layers (GCNConv):
   - o Propagate information across edges.
   - o Aggregate features from neighboring nodes.
2. Activation Function: o ReLU introduces non-linearity for better learning.
3. Weighted Edges: o Ratings (edge_weight) modulate the contribution of neighboring nodes during aggregation





Similarity Based Clusters

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Sample User ID: imrwqvj
User's Past Reviews:
                                  Product Name  Product Rating
120       Natasha Denona My Mini Dream Palette               5
121                 Natasha Denona Glam Palette              3
122  rms beauty ReDimension Hydra Powder Blush               5

Top Recommended Products:
1. Viseart Eye Shadow Palette
2. CHIKUHODO Z Series Z-11 Blend Brush
3. Viseart Petits Fours Palette
4. rms beauty ReDimension Hydra Powder Blush
5. Natasha Denona Baby Bronze Palette
6. Hindash Beautopsy Palette
7. Auric Cosmetics Glow Lust Radiant Luminizer Travel Size
8. Charlotte Tilbury Bigger Brighter Eyes Filter Exaggereyes
9. Charlotte Tilbury Eyes to Mesmerise
10. Hourglass Veil Translucent Setting Powder
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Live Testing

THANK
YOU