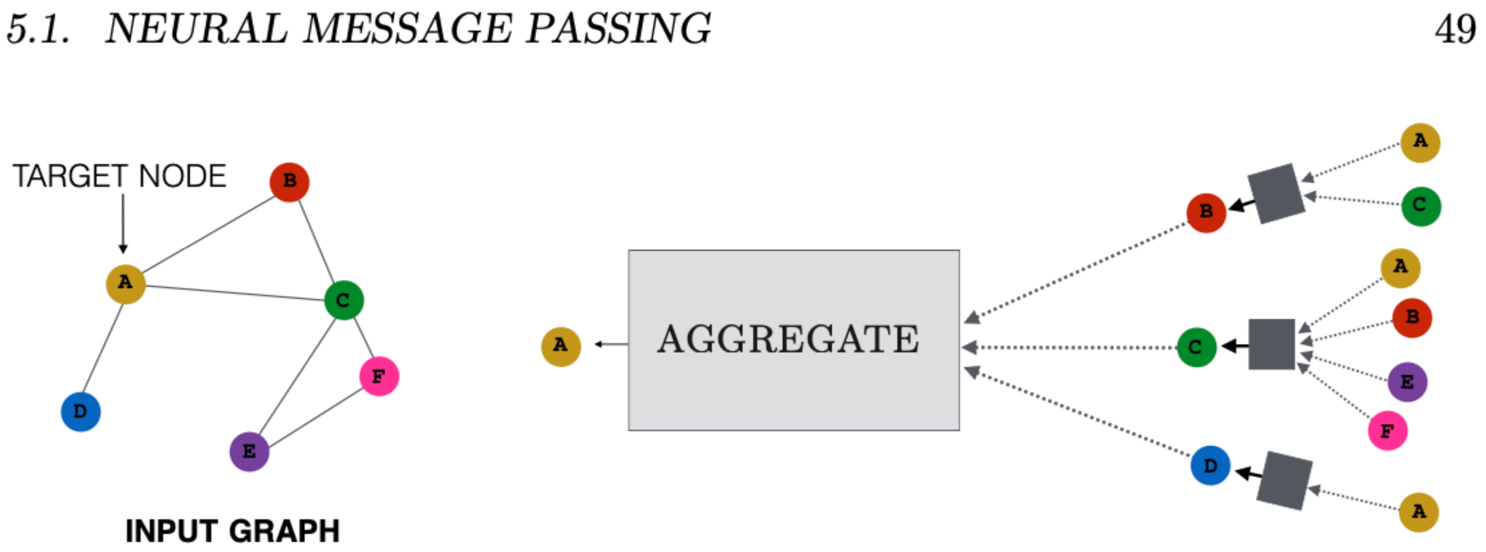
Graph Representation Learning

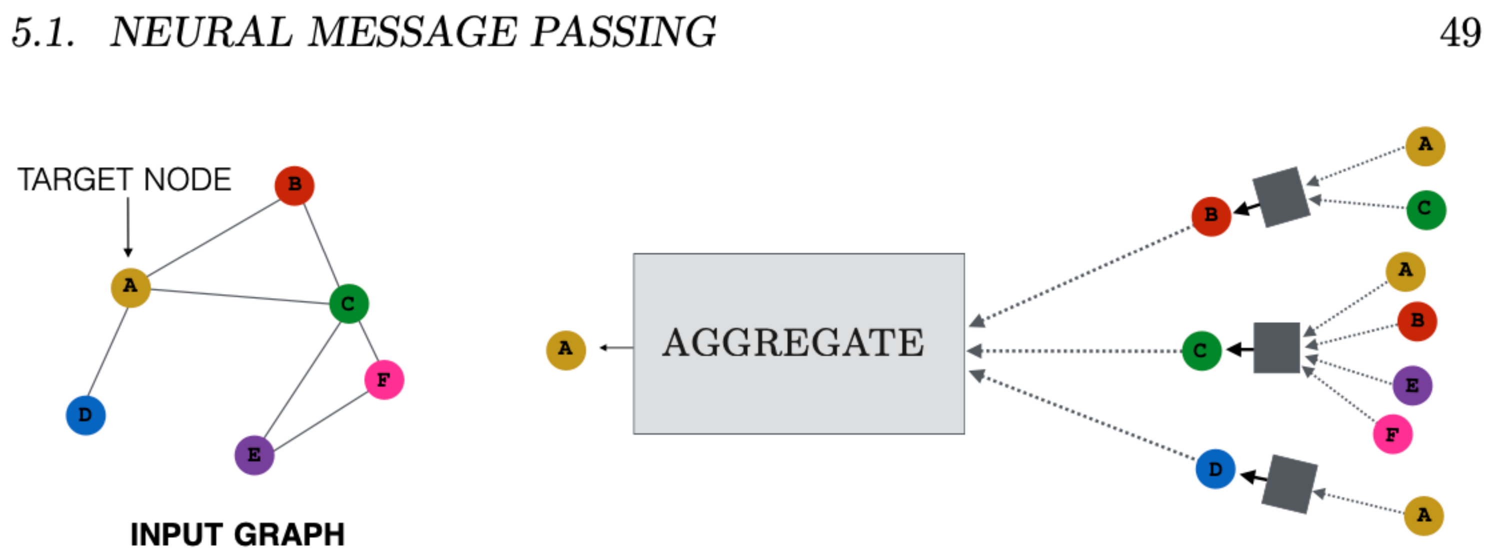
Message Passing

Message Passing

- The defining feature of a GNN is that it uses a form of ***neural message passing*** in which vector messages are exchanged between nodes and updated using neural networks [Gilmer et al., 2017].



Message Passing



- ❑ **Message = information(e.g., node features)**
- ❑ **Message Passing : aggregate message.**

- ❑ **오른쪽 그림은 2layer 예시. Target A의 이웃은 B,C,D**
  - **B는 또 A,C로부터 C는 A,B,E,F 로부터, D는 A로부터 aggregate message.**

Negative sampling

Negative sampling

- **Why?**
  - **계산의 효율성**

- **How?**
  - **Parameter update시 중요한 것만 뽑아서 update.(모든 파라미터를 업데이트할 필요 없음)**

- **In gnn: target노드의 이웃 노드 parameter만 update.**
  - **한 100 홉의 이웃 노드 parameter를 업데이트 할 필요는 없다.**

SOTA model for recommend system

SOTA model

- Graph4Rec: A Universal Toolkit with Graph Neural Networks for Recommender Systems(2019)
  - Dataset: RetailRocket3 , Rec154 , Tmall5 and UB6 . RetailRocket
- Improving Training Stability for Multitask Ranking Models in Recommender Systems(2023)
  - Dataset: Conducted on a YouTube production dataset
- Mixed Dimension Embeddings with Application to Memory-Efficient Recommendation Systems
  - Dataset: MovieLens dataset, Criteo Kaggle dataset(2019)
- Compositional Embeddings Using Complementary Partitions for Memory-Efficient Recommendation Systems(2019)
  - Dataset: Criteo Ad Kaggle Competition dataset