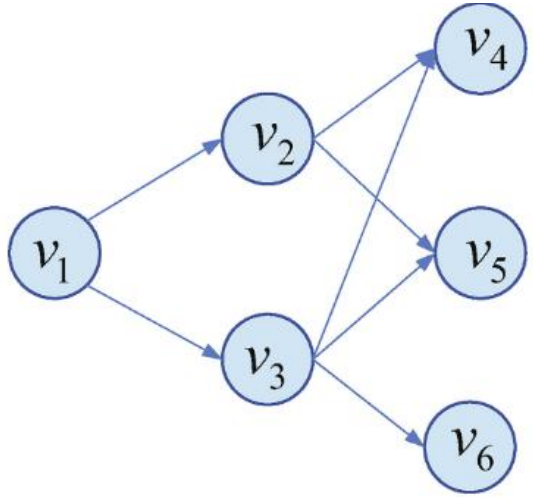
# 图的相关查询问题

# 一、图中顶点相似度查询

- 1.找到与查询点相似度较高的一个或多个点
- 2.相似度计算模型：Jaccard，simRank等
- 3.应用：文章推荐，找到相似度最高的文章




v4---v5 ， v2---v3

# 二、两个图的相似度查询

- PGSim: Efficient and Privacy-Preserving Graph Similarity Query Over Encrypted Data in Cloud （2023）
- IEEE Transactions on Information Forensics and Security

- PrigSim: Towards Privacy-Preserving Graph  Similarity Search as a Cloud Service
- IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING, 2023

- 问题：输入：一个查询图。 查询范围：图数据集。
- 结果：找到与查询图相似性较高的一系列图

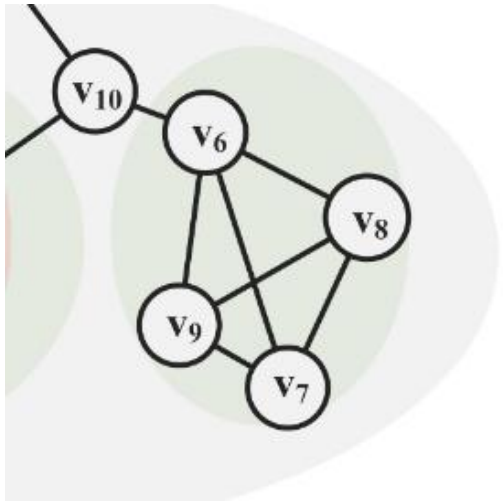
# 三、子图查询

1.community search

找到包含特定顶点的一个联通子图，且顶点的连接关系符合要求。比如每个顶点的度数都不低于某个规定值k（k-core）。

2.Privacy-Preserving Approximate Minimum  Community Search on Large Networks

3.IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, VOL. 19, 2024




v6,v8,v9,v7的度数都不低于3

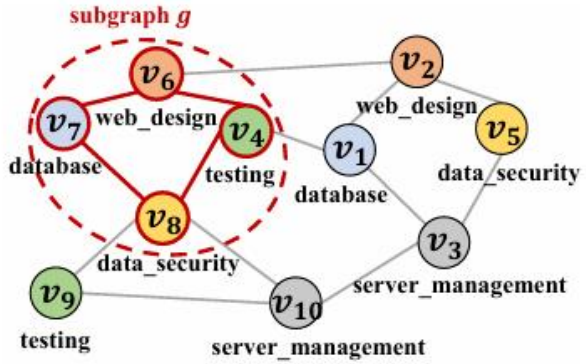
# 三、子图搜索

1.Subgraph Matching（exact,approximate）

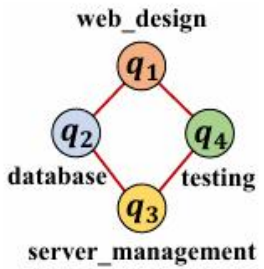
2.找到与搜索图相同结构的子图（点与点，边与边）

3.Privacy-Preserving Graph Matching Query Supporting Quick Subgraph Extraction

4.IEEE TRANSACTIONS ON DEPENDABLE AND SECURE COMPUTING, VOL. 21, NO. 3, MAY/JUNE 2024




(a) collaboration social network $G$




(b) query graph $q$

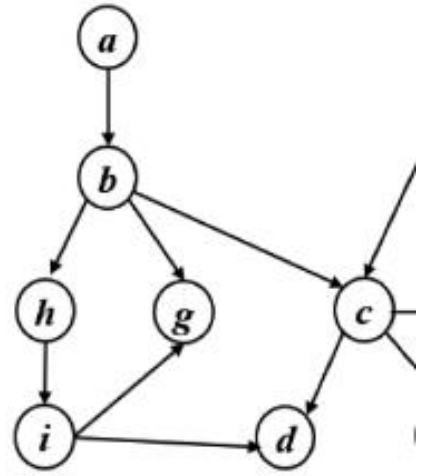
# 三、子图查询

1.Subgraph Covering

2.给定图 G 中找到一组子图，使得这些子图的并集包含查询子图 Gq的所有节点和边.

# 四、可达性查询

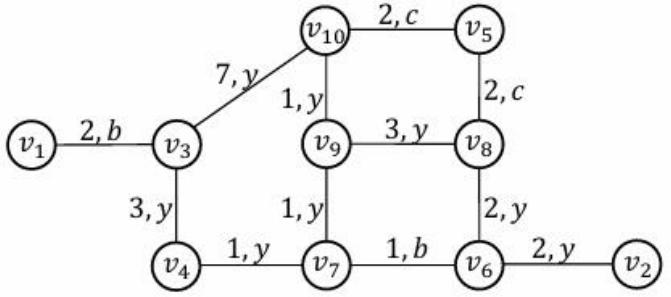
- 1.判断两个顶点之间是存在一条路径(单源，K-hop)
- 2.Enabling Privacy-Preserving K-Hop Reachability Query Over Encrypted Graphs
- IEEE Transactions on Services Computing




a到i在3hop内可达，2hop内不可达

# 五、最短距离查询

- 1.找到两个顶点间的最短距离
- 2.各种约束条件
  - 需经过中间点多源：货车需要到指定的地方装上货再去目的地（物流运输中的中转站设置）
  - k-hop:源点在经过不超过k条边到达目标点的最短距离
  - top-k:前k个最短路径
  - 阈值约束最短距离：需要过路费
  - 相关性约束最短距离:道路限行




查询v1-v2,允许经过标签为{b,y}

# 五、最短距离查询

- Differentially Private All-Pairs Shortest Path Distances: Improved Algorithms and Lower Bounds
- Proceedings of the 2023 Annual ACM-SIAM Symposium on Discrete Algorithms
- PGAS: Privacy-preserving graph encryption for accurate constrained shortest distance queries  2020
- Information Sciences
- Enabling Privacy-Preserving Shortest Distance Queries on Encrypted Graph Data. 2021
- IEEE Transactions on Dependable and Secure Computing