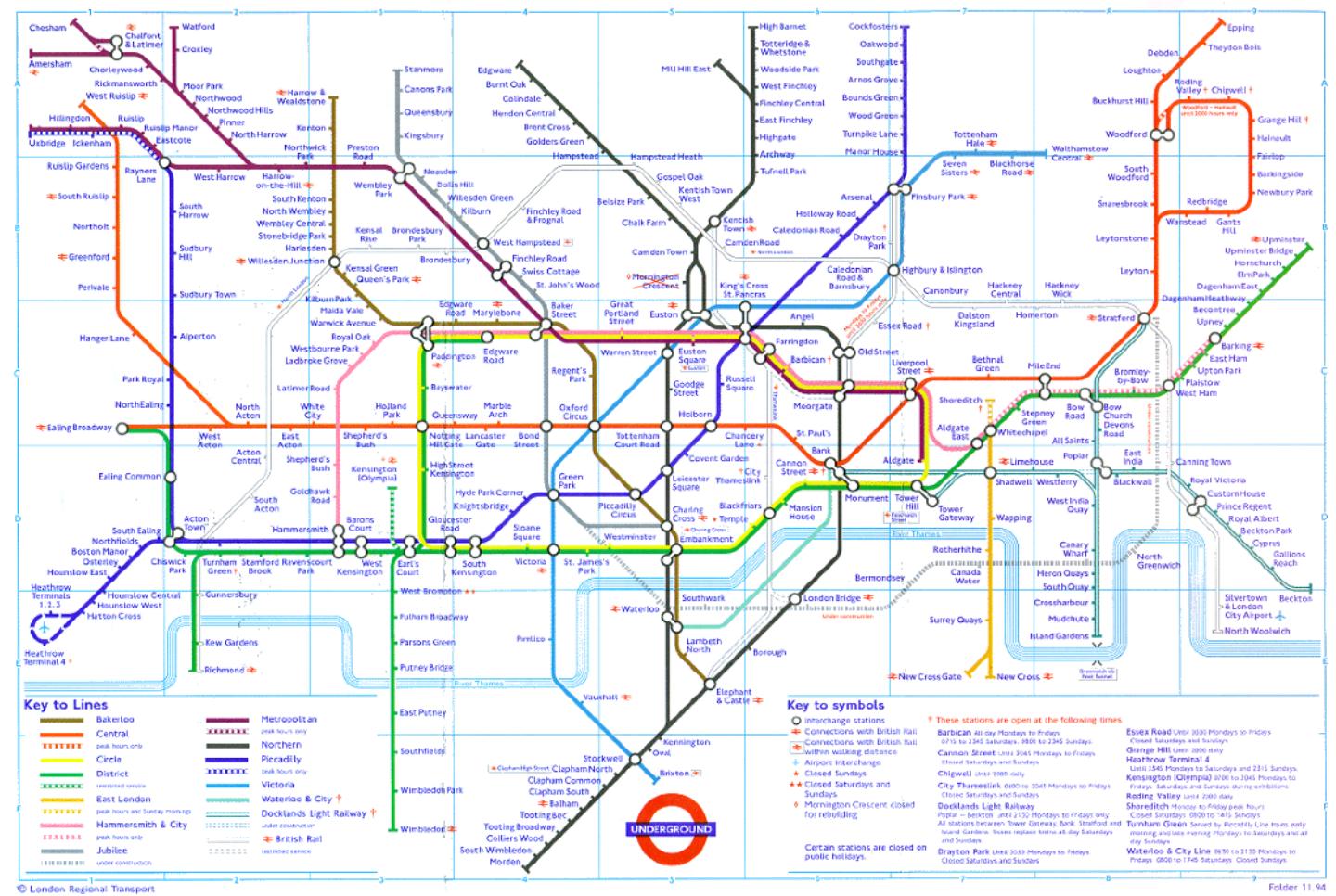


NETWORK ANALYSIS FOR HUMANITIES & SOCIAL SCIENCES

Using a subset of Scott
B. Weingart's slides from
his presentation at the
University of Richmond
January 27, 2017

Google

GOOGLE | 1998



LONDON UNDERGROUND

A network of stations.



facebook

December 2010

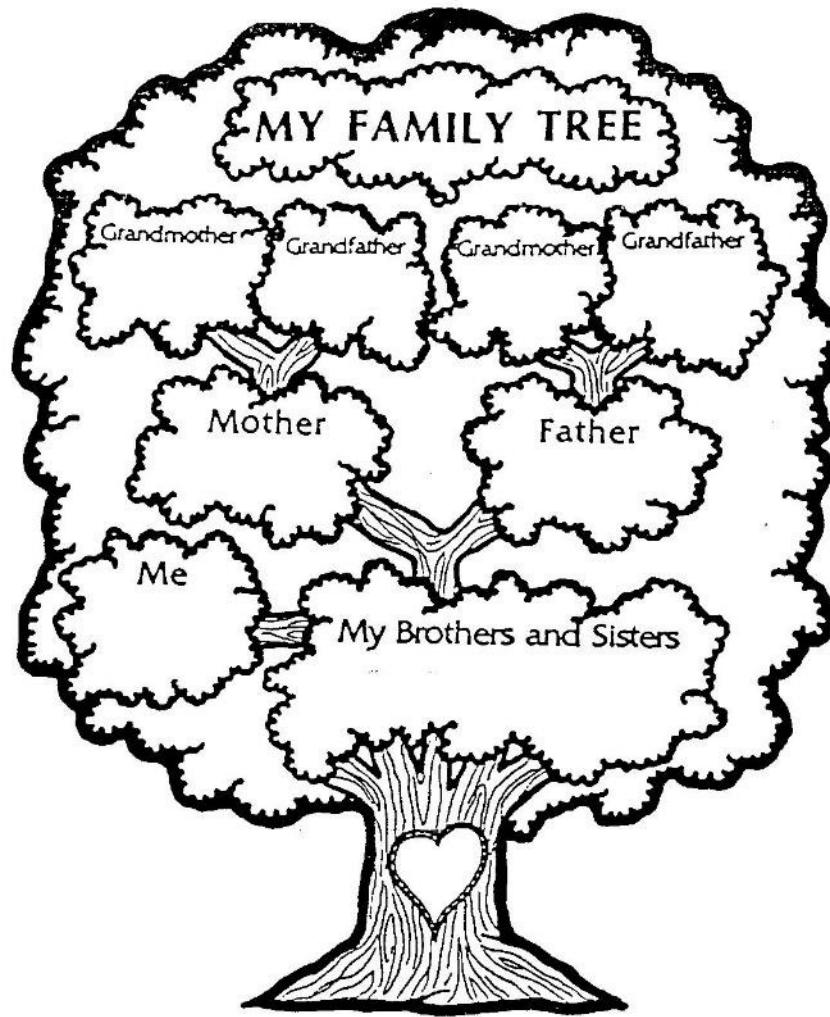
FACEBOOK FRIENDS

A network of friends.



UNITED STATES RIVERS

A network of water.



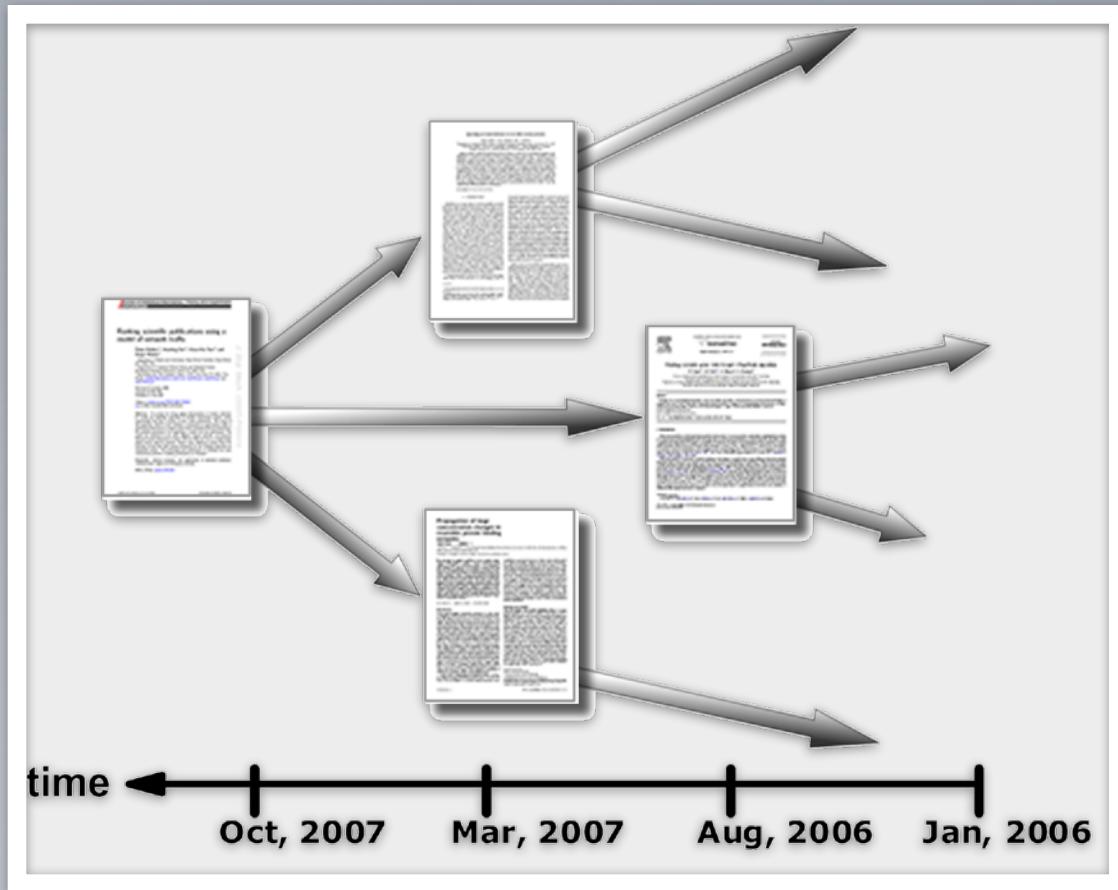
FAMILY TREE

A network of relations.



TELEGRAPH CABLES

A 1901 network of
submarine communication.



CITED ARTICLES

A network of text.



ELECTRICAL GRID

A network of power.

WHAT IS A NETWORK?

entities

- people
- organizations
- concepts
- objects
- documents
- etc.

**connected to
each other by**

relationships

- “is friends with”
- “shares a board member with”
- “is similar to”
- “is a type of”
- “contains a reference to”
- etc.

WHAT IS A NETWORK?

entities

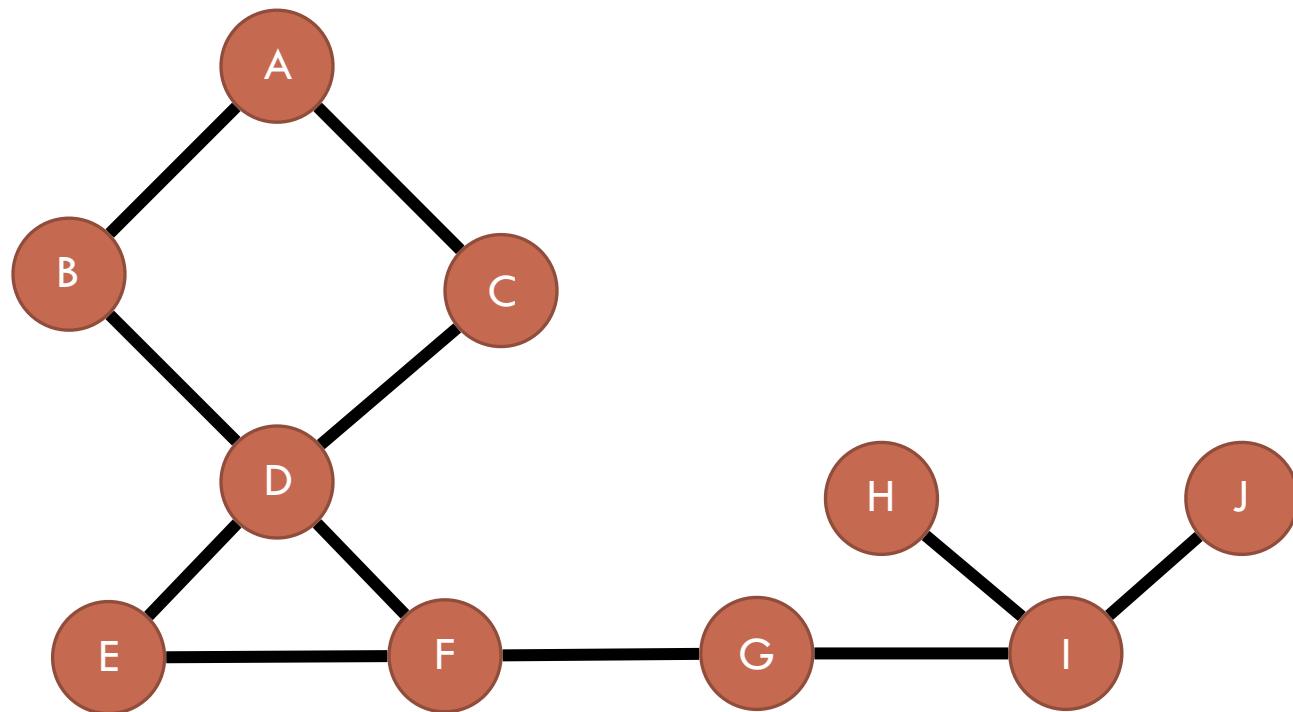
- nodes
- actors
- agents
- vertices
- points
- etc.

**connected to
each other by**

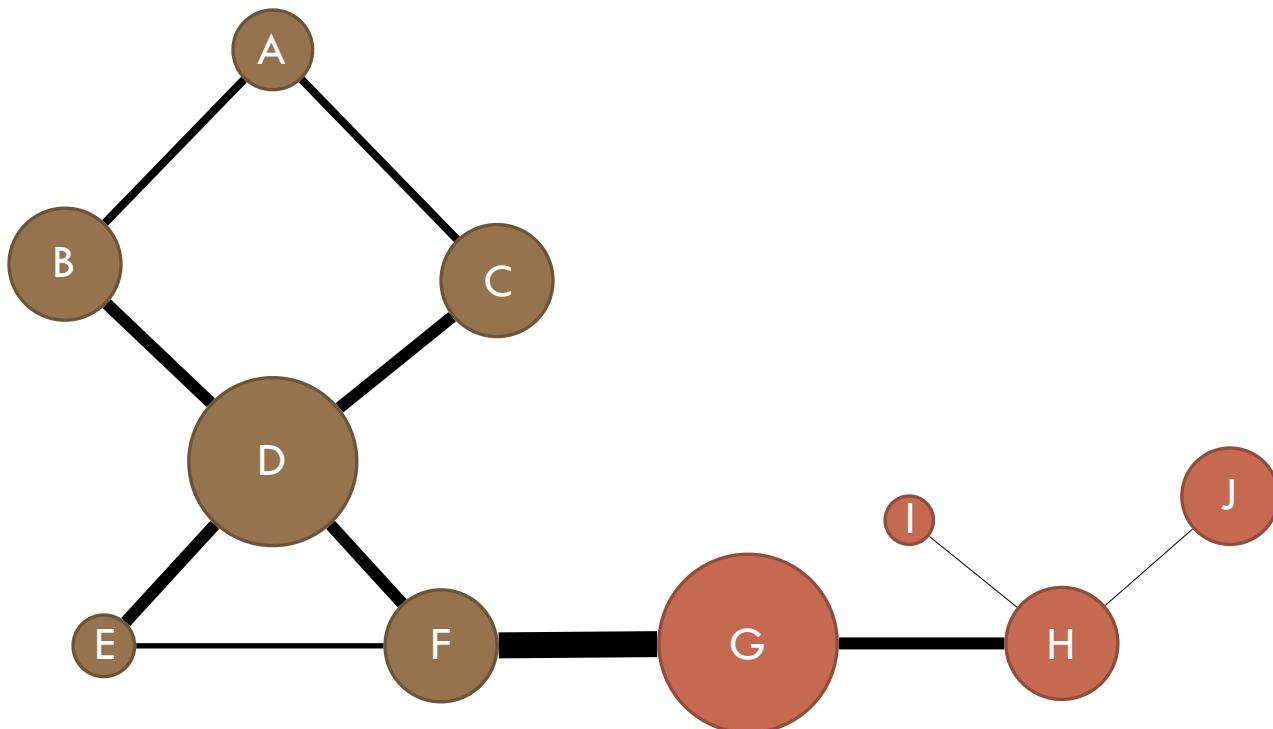
relationships

- edges
- arcs
- links
- ties
- relations
- etc.

NODES AND EDGES

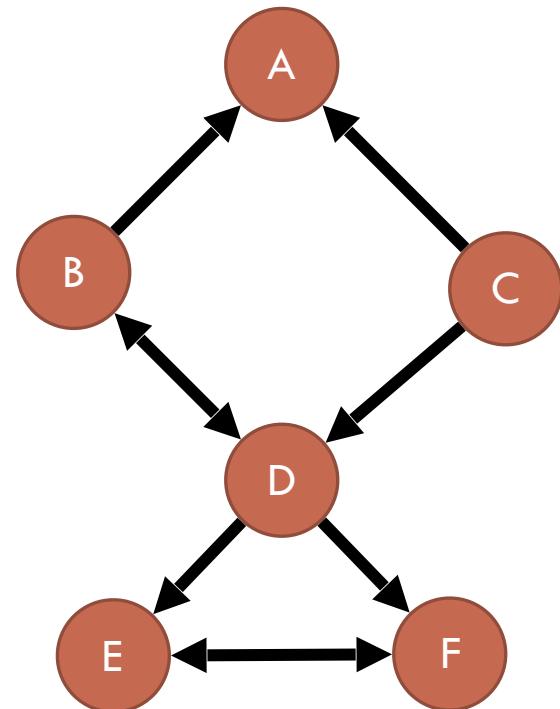


ATTRIBUTES

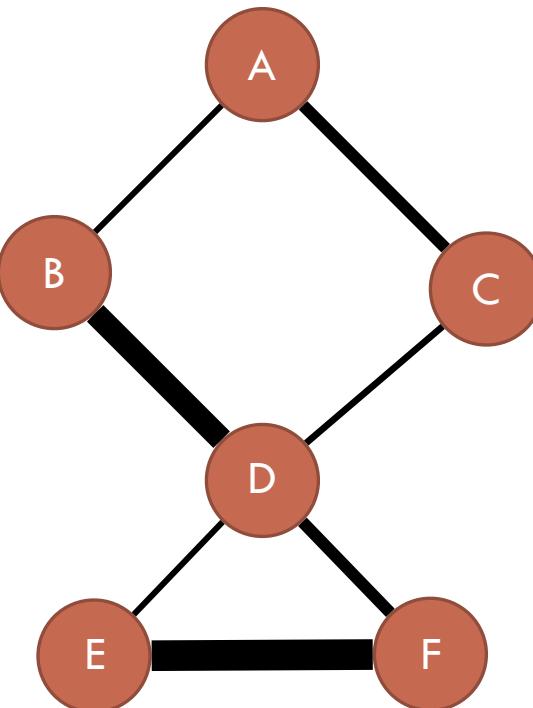


EDGE ATTRIBUTES

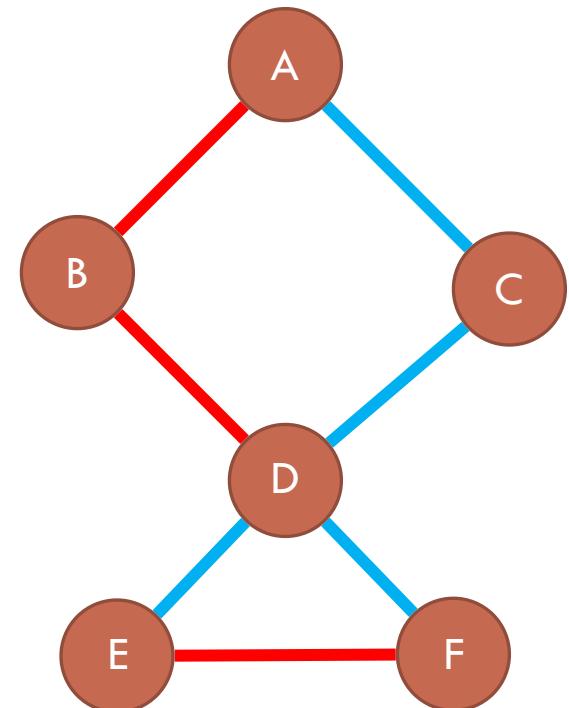
Directed & Undirected



Weighted & Unweighted

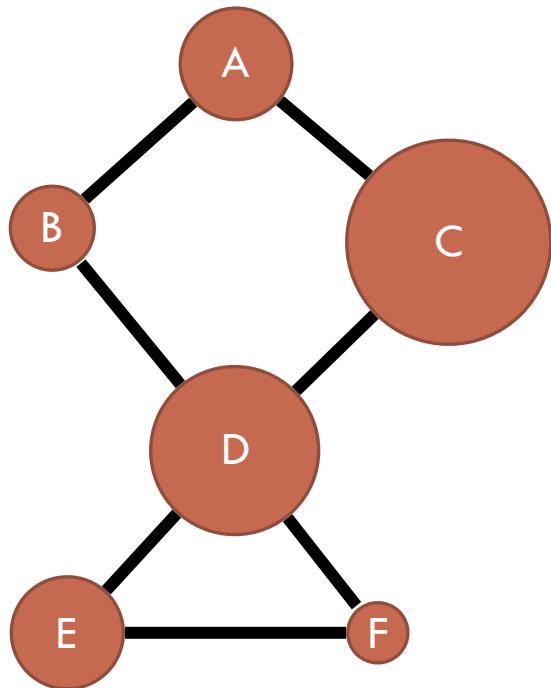


Types



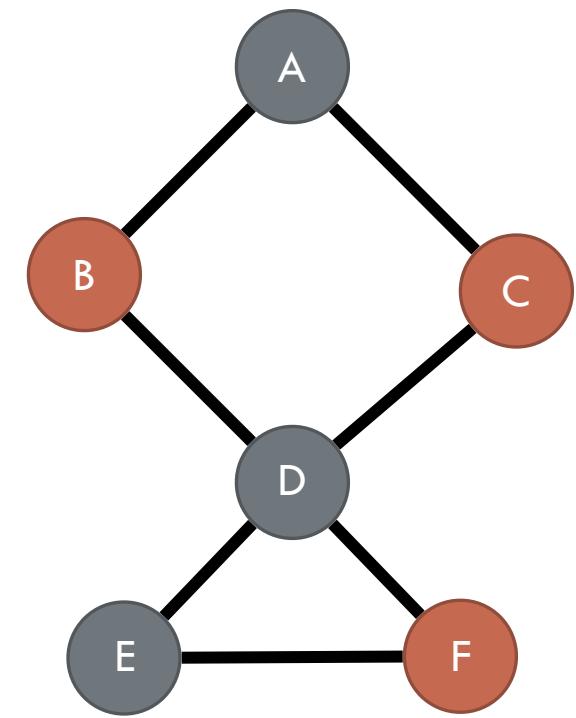
NODE ATTRIBUTES

Numerical

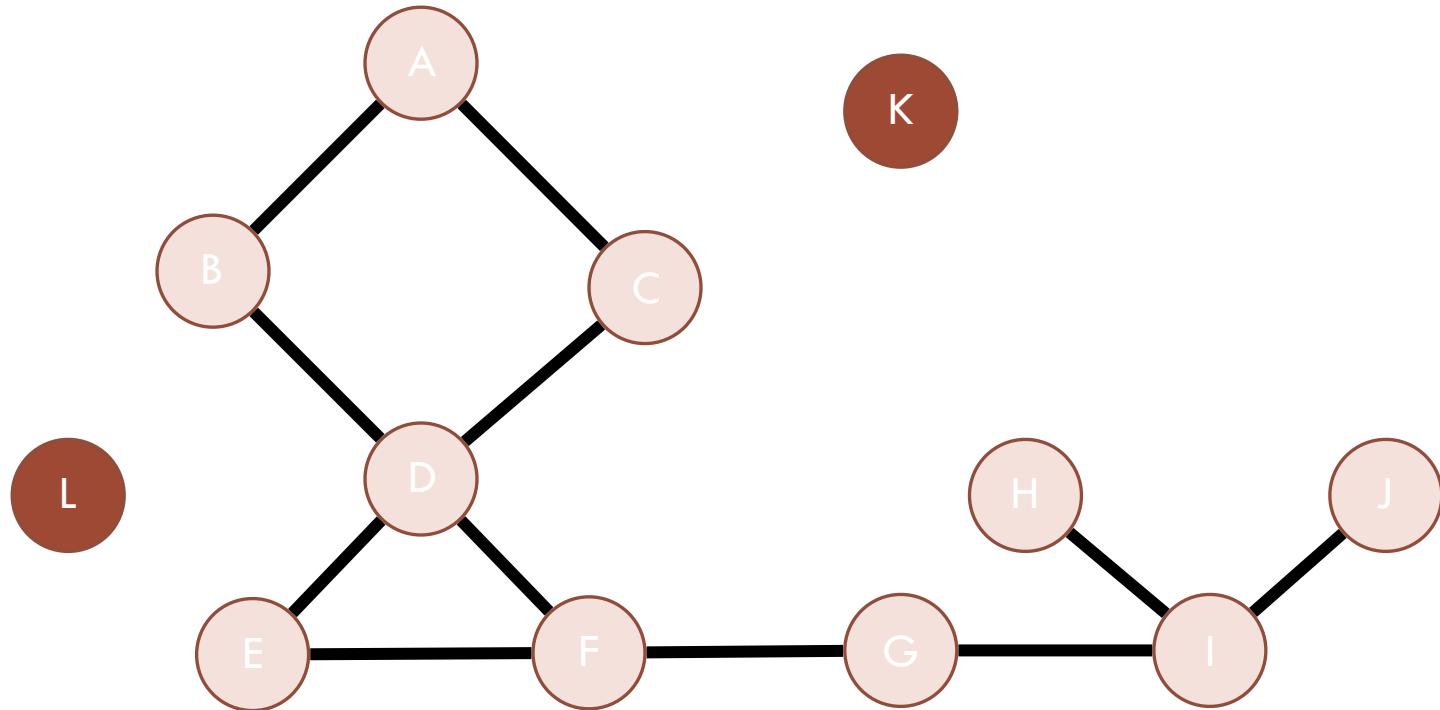


- Gender
- Location
- Start/End Time
- Age
- Title
- Salary
- Electrical Output
- GDP
- Genre
- Full Text

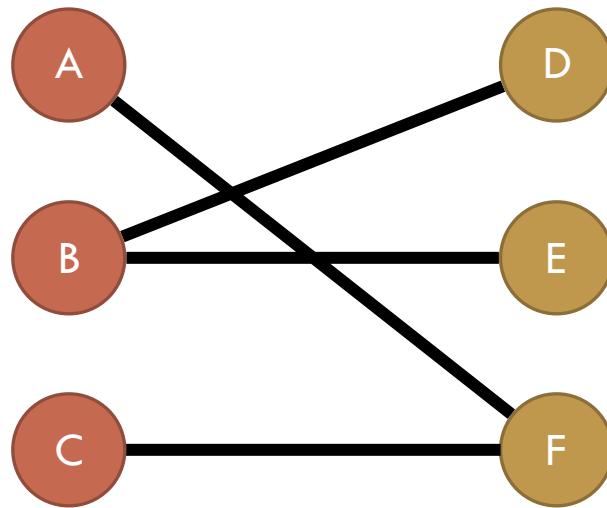
Categorical



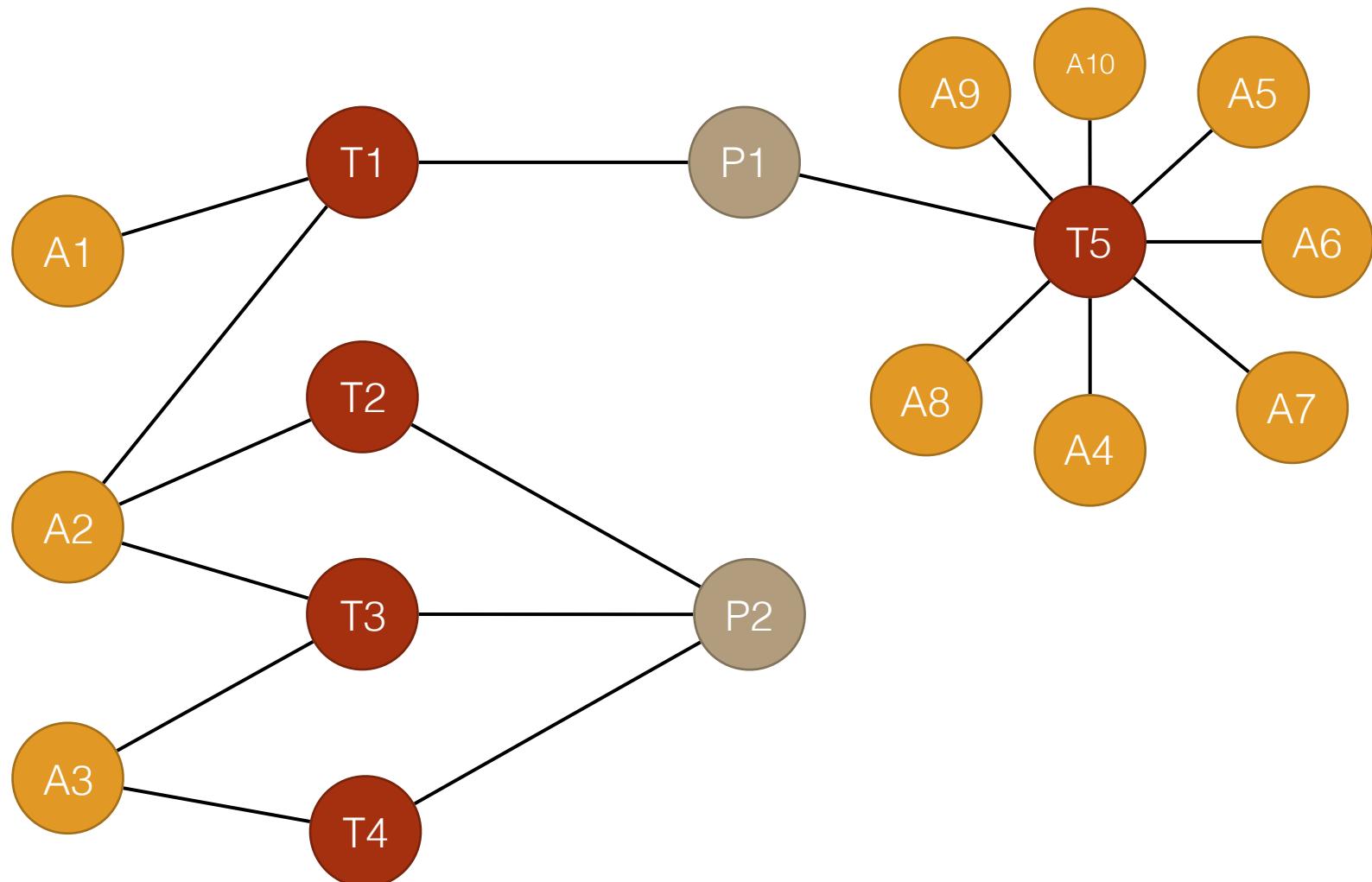
ISOLATES

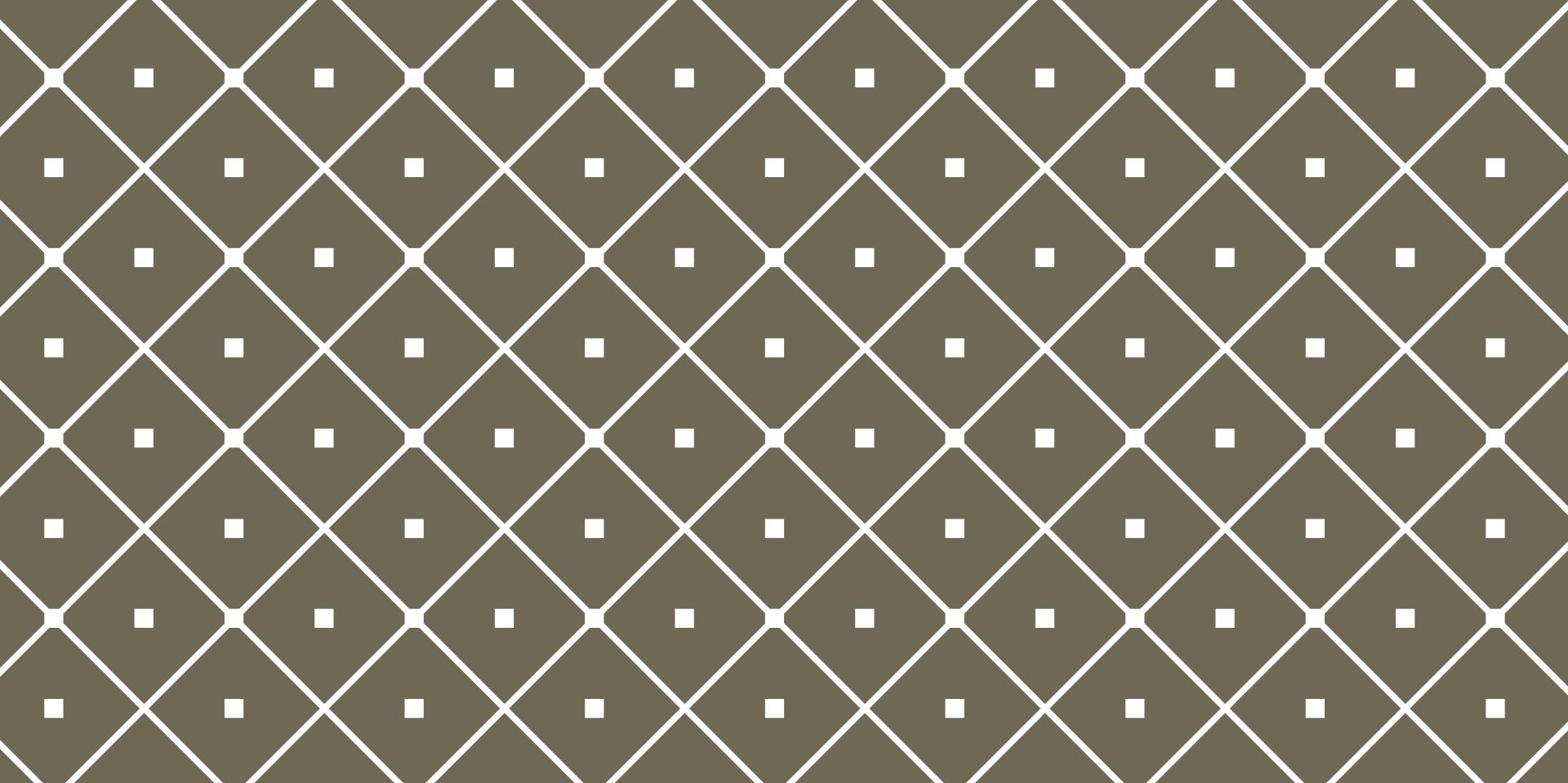


BIPARTITE NETWORKS



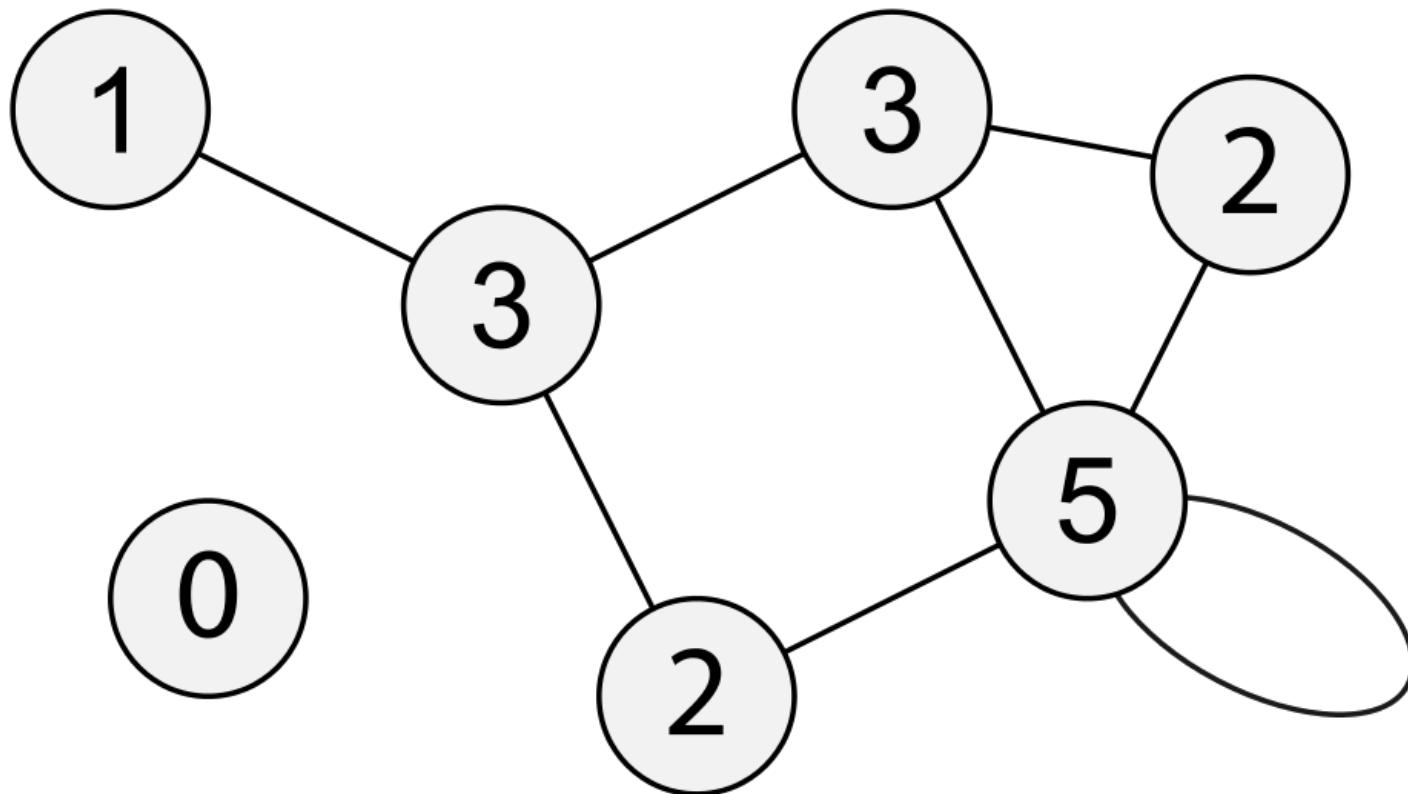
K-PARTITE NETWORKS





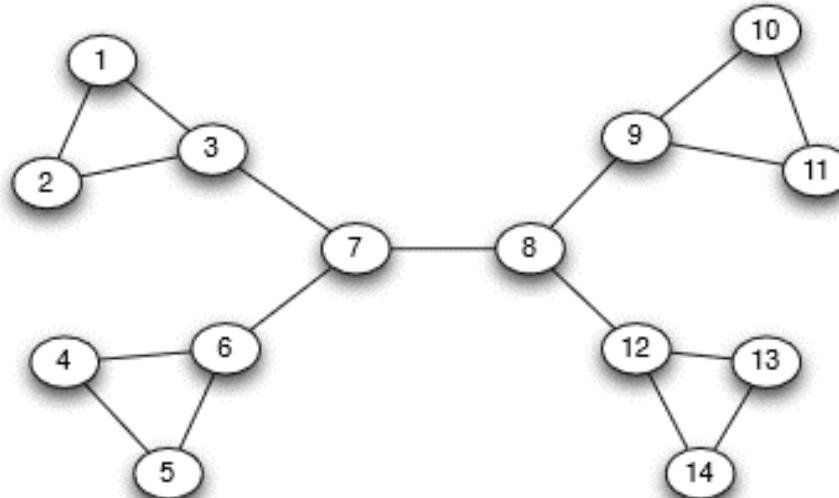
ANALYSIS

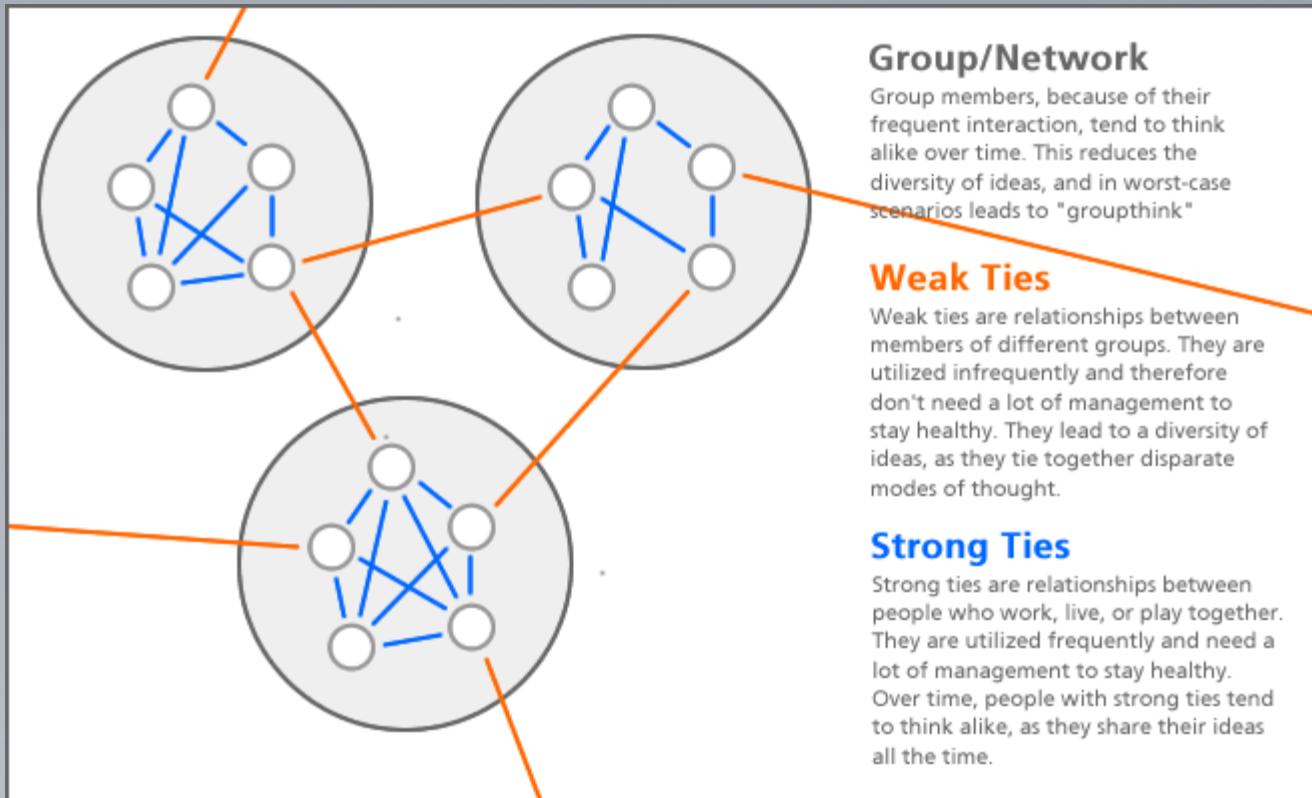
DEGREE CENTRALITY



COMMUNITY DETECTION

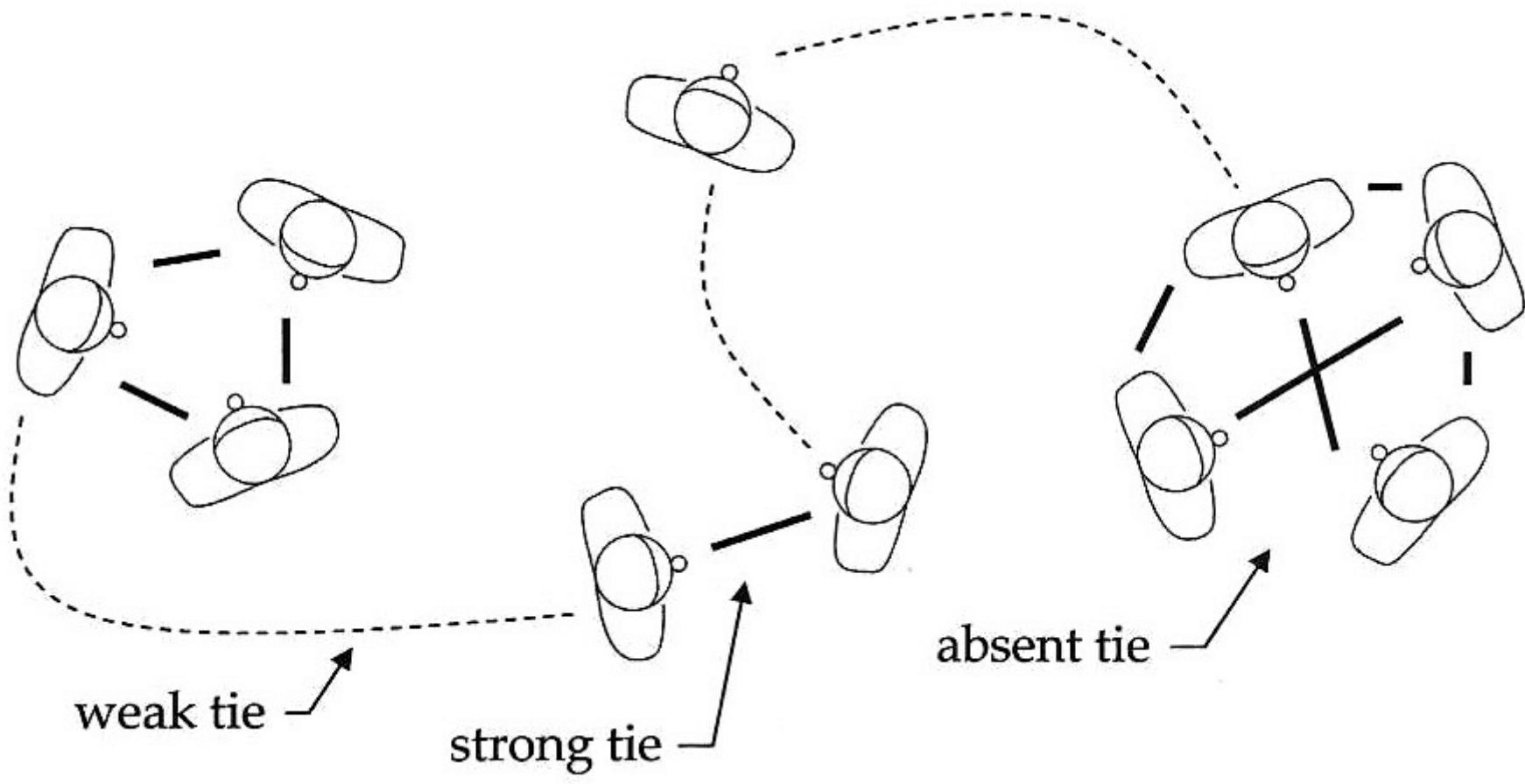
- **Divisive (Top-Down)**
- **Agglomerative (Bottom-Up)**
- **How would you divide this graph?**





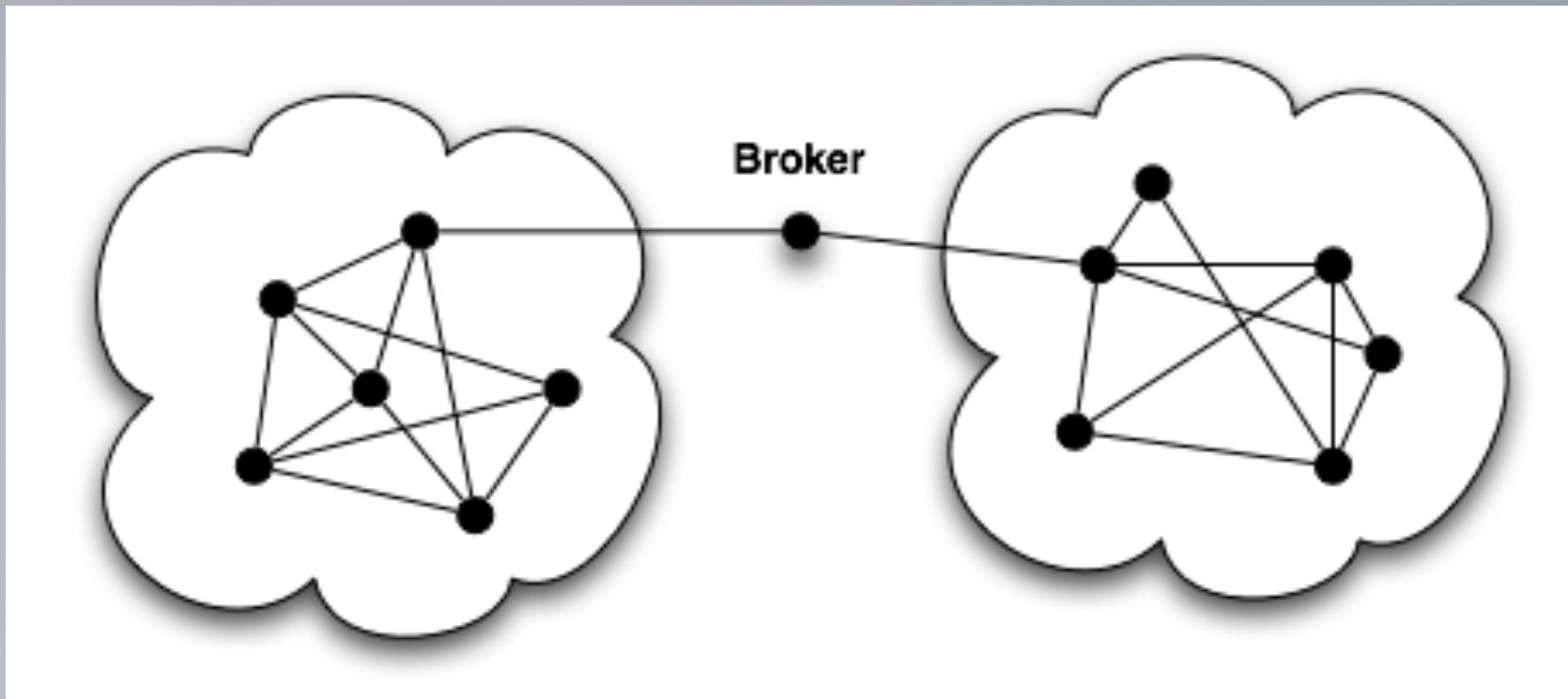
THE STRENGTH OF WEAK TIES

Granovetter (1973)



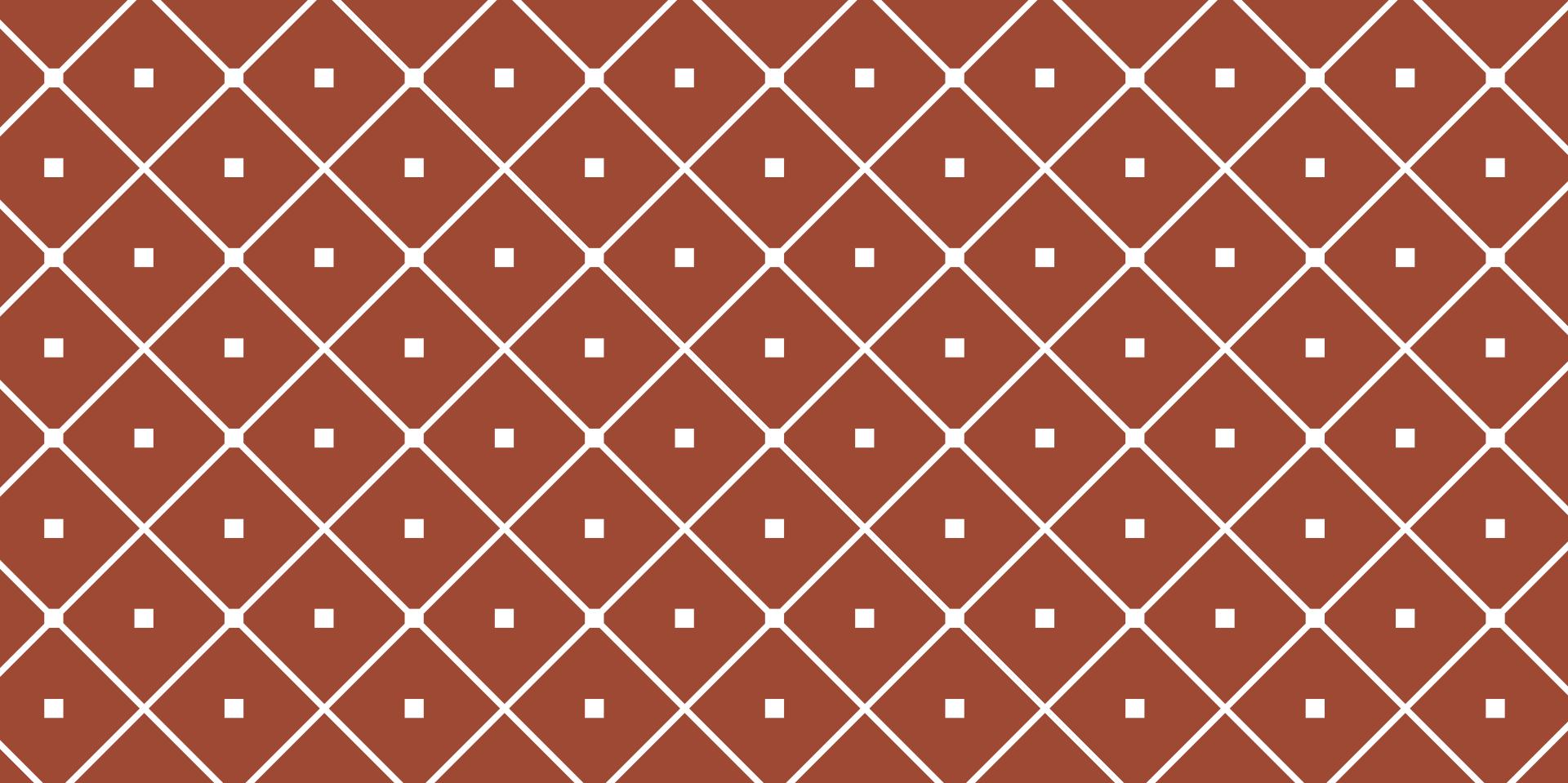
GETTING A JOB

Granovetter, 1974



STRUCTURAL HOLES

Burt (1992)



LET'S TRY THIS!