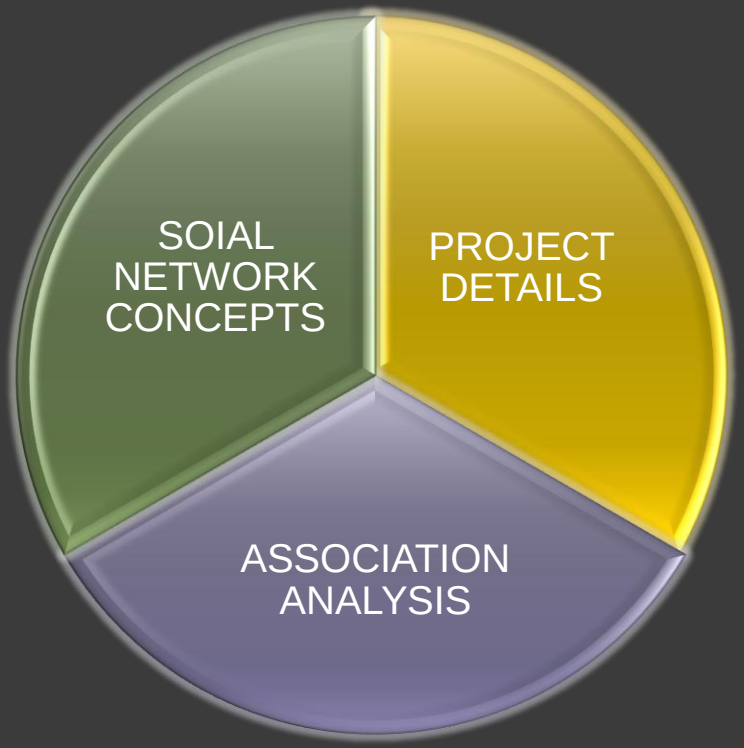
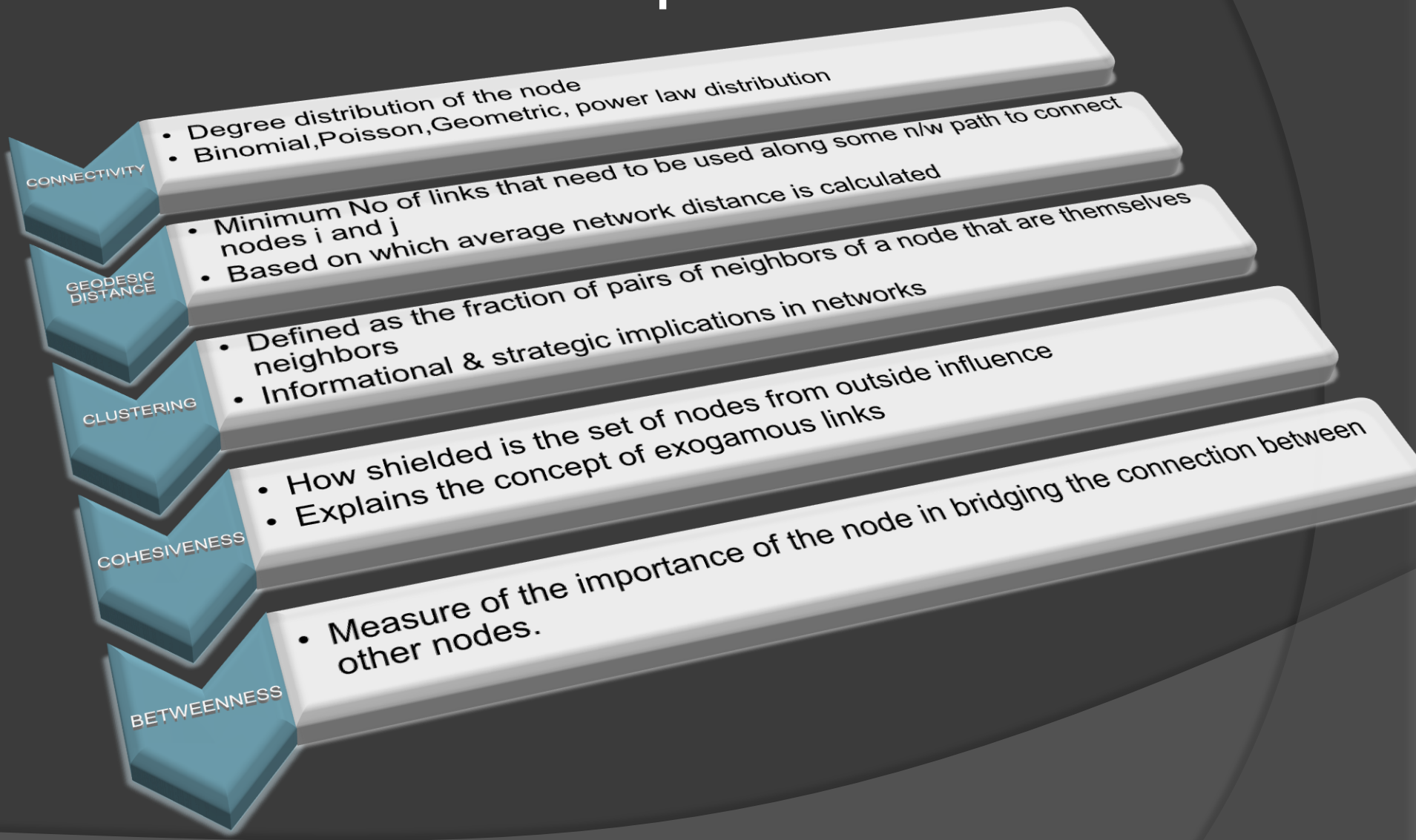
PRESENTATION PIE



Social network parameters

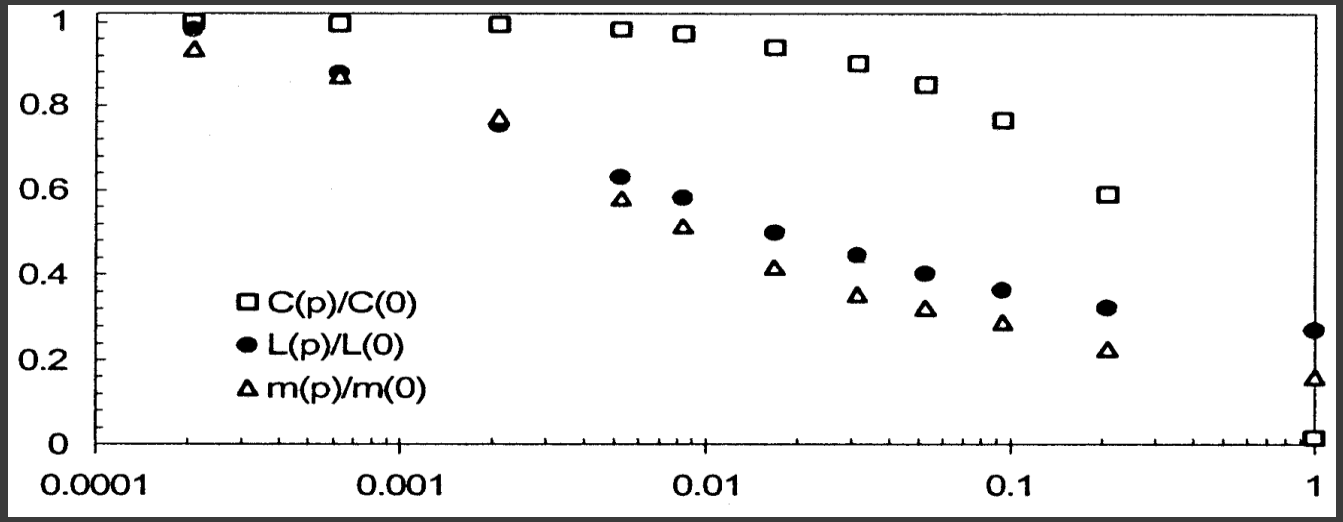


SOCIAL NETWORKS

- ✓A feedback network is one where active nodes or agents send tokens or communications through their network to help locate potential partners for new ties.
- ✓When a previously unconnected partner is located given constraints of distance a new tie is formed, creating a feedback loop.
- ✓Failing to locate a partner within the network, the active node engaged in partner selection recruits a new partner from outside the existing network and forms a tie.
- ✓Three parameters(alpha, beta & Gamma) are used to govern network formation in this probabilistic generative model. These govern levels of node activity, distance decay in how soon network traversal fails to find a partner, and the extent to which local hubs are used in network traversal.
- ✓The model provides an explanation for how hubs are formed in networks, how well-traveled edges are formed, how cycles and cohesion are formed, and how other features of real-world networks may result from different combinations of three basic network parameters.

SMALL WORLD NETWORKS

- ✓Like many real-world networks, feedback networks modeled by this process evolve large networks with cohesive ties (social circles). In this way, small worlds with cohesive subgroups and relatively short distances may be generated, scale-free networks may be generated, or a variety of other network topologies may be generated.
- ✓Captures the small world phenomenon of strangers being linked by a mutual acquaintance
- ✓Essential Features:
  - A small average shortest path length
  - A large clustering coefficient



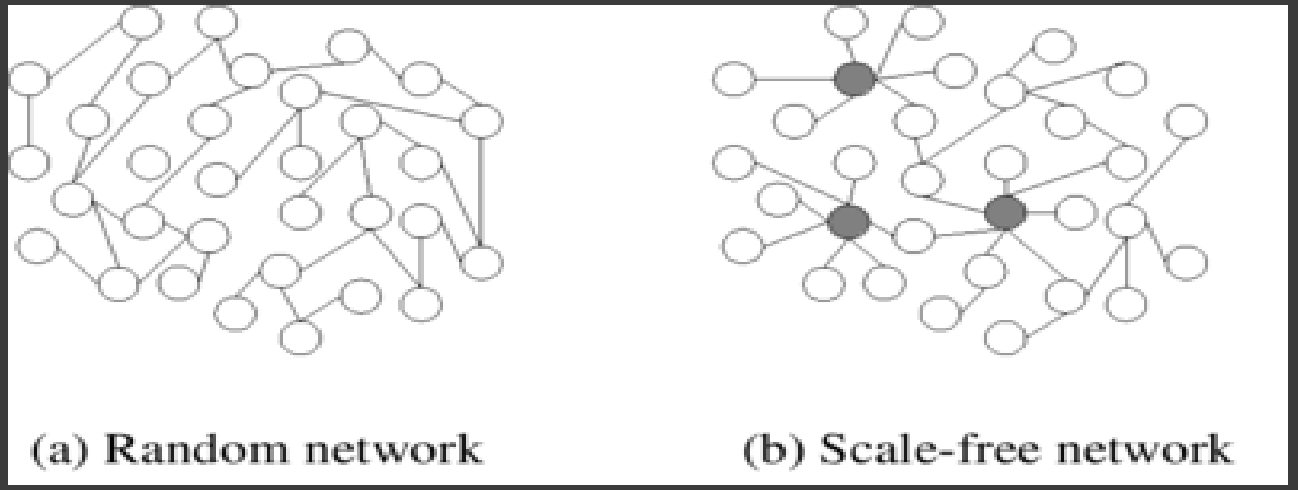
FREE SCALE NETWORKS

✓Small world network model does not account for the heterogeneity encountered in many real world networks.

✓A **scale-free network** is a network whose degree distribution follows a power law.

✓The two essential features:

- The mechanism of preferential attachment has been proposed as an underlying generative model to explain power law degree distributions .
- GrowthThe network is formed, becoming even larger, through the successive arrival of new nodes that, upon entry link to some of the pre existing nodes.



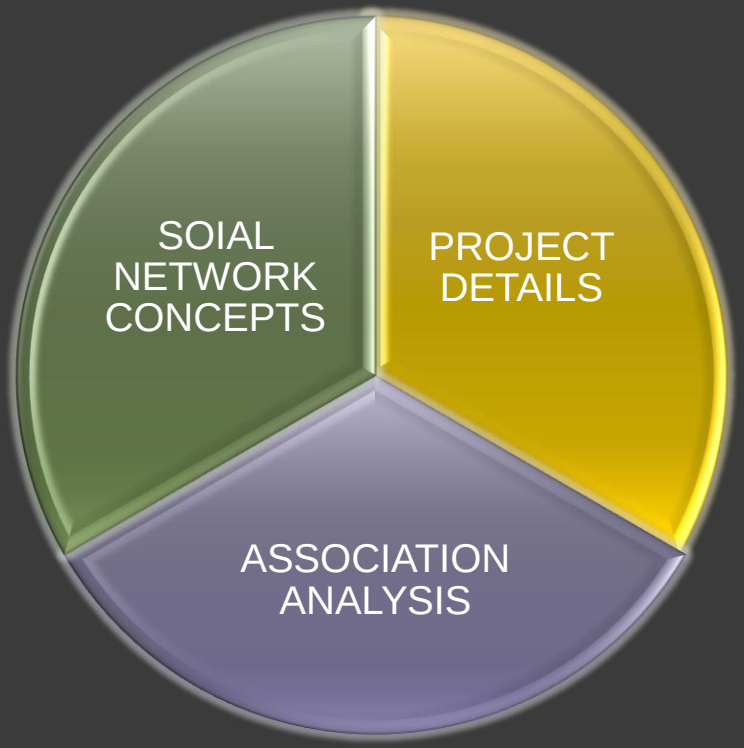
“Birds of a feather flock together”

- The scientific word for this psychological phenomenon is “**HOMOPHILY**”.
- **Homophily** (i.e., love of the same) is the tendency of individuals to associate and bond with similar others .
- Homophily is the principle that a contact between similar people occurs at a higher rate than among dissimilar people.
- McPherson, Smith-Lovin and Cook (2001) cite over one hundred studies that have observed homophily in some form or another. These include age, gender, class, organizational role ,etc.
- Homophily Distinction:
  - *Baseline homophily :*homophily effects that are created by the demography of the potential tie pool
  - *Inbreeding homophily :homophily measured as explicitly over and above* the opportunity set .

McPherson, M., L. Smith-Lovin, and J. Cook. (2001). Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology*.

Lazarsfeld, P., and R. K. Merton. (1954). Friendship as a Social Process: A Substantive and Methodological Analysis. In *Freedom and Control in Modern Society*.

PRESENTATION PIE



ASSOCIATION ANALYSIS

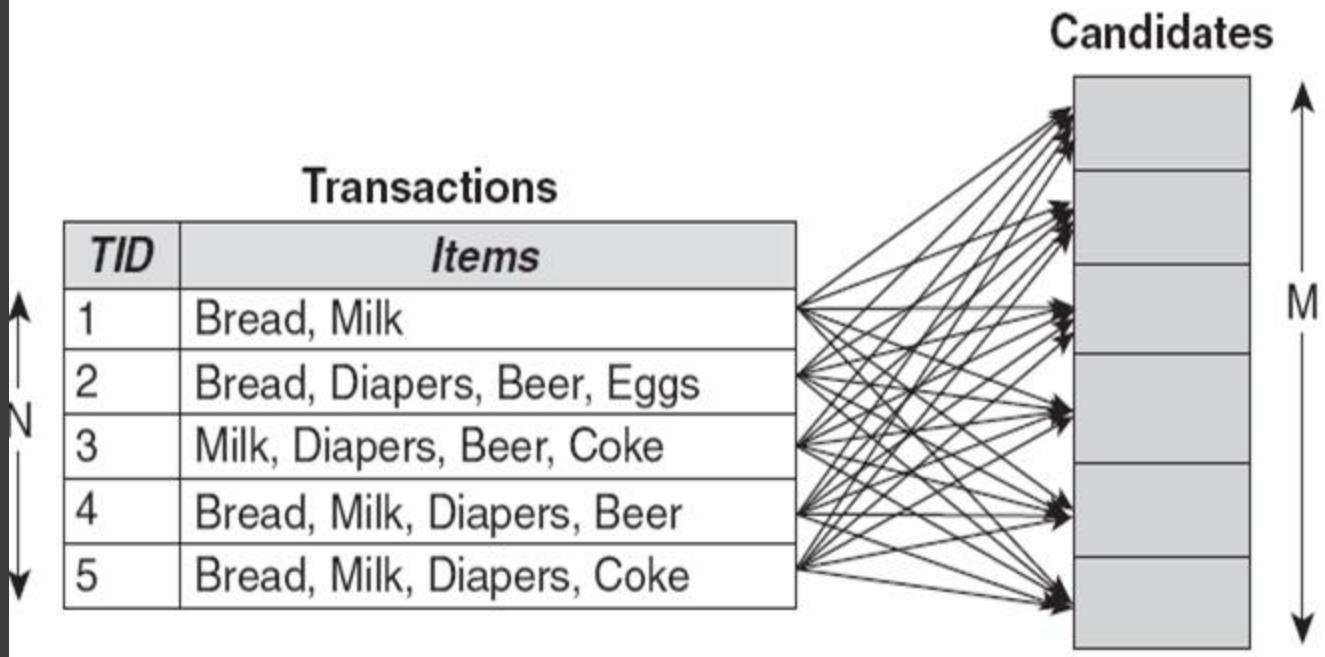
- It is a methodology used for discovering interesting relationships hidden in large datasets.

- Example Algorithms : Apriori Algorithm, FP-Growth Algorithm

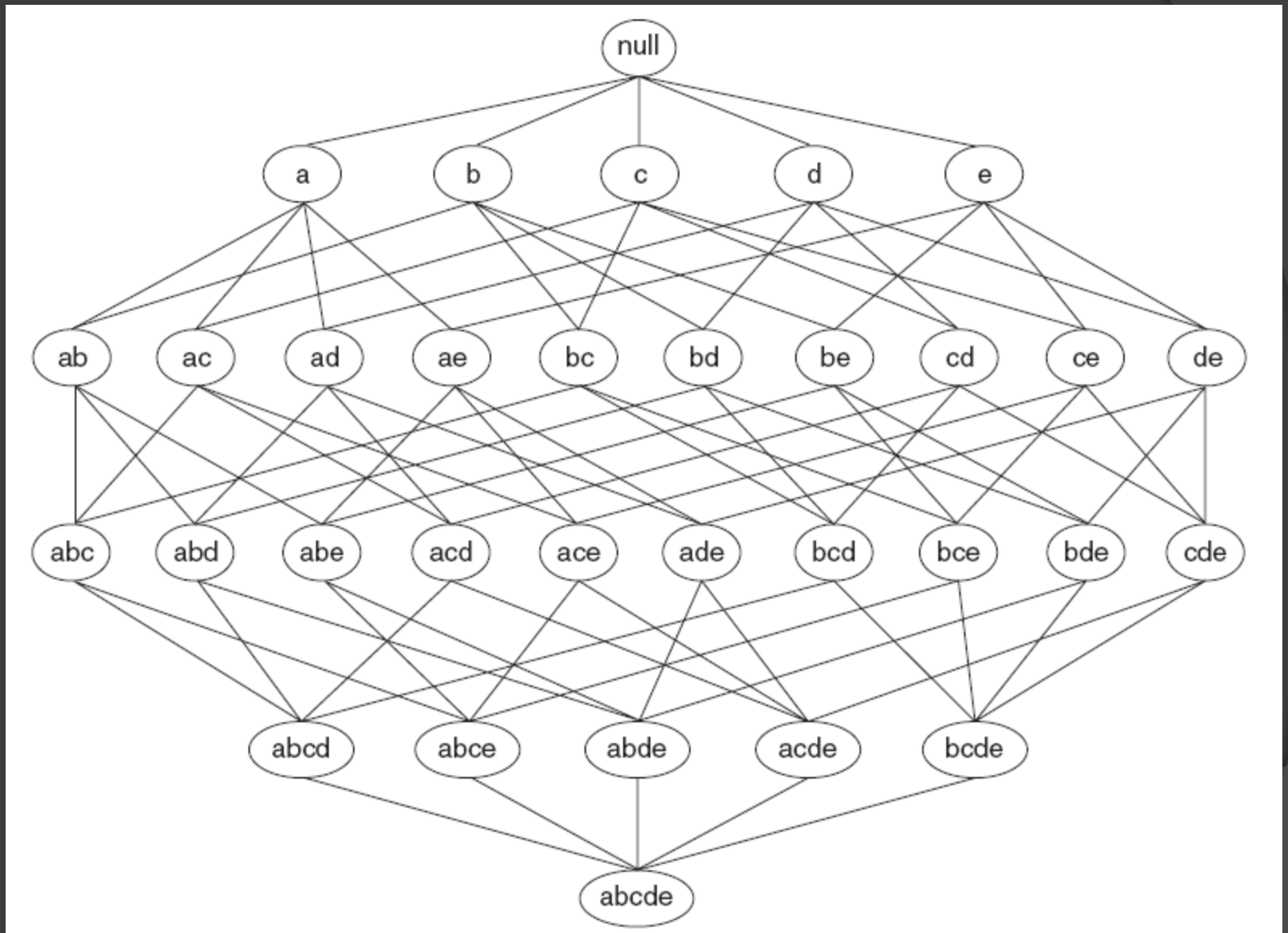
An example of market basket transactions.

TID	Items
1	{Bread, Milk}
2	{Bread, Diapers, Beer, Eggs}
3	{Milk, Diapers, Beer, Cola}
4	{Bread, Milk, Diapers, Beer}
5	{Bread, Milk, Diapers, Cola}

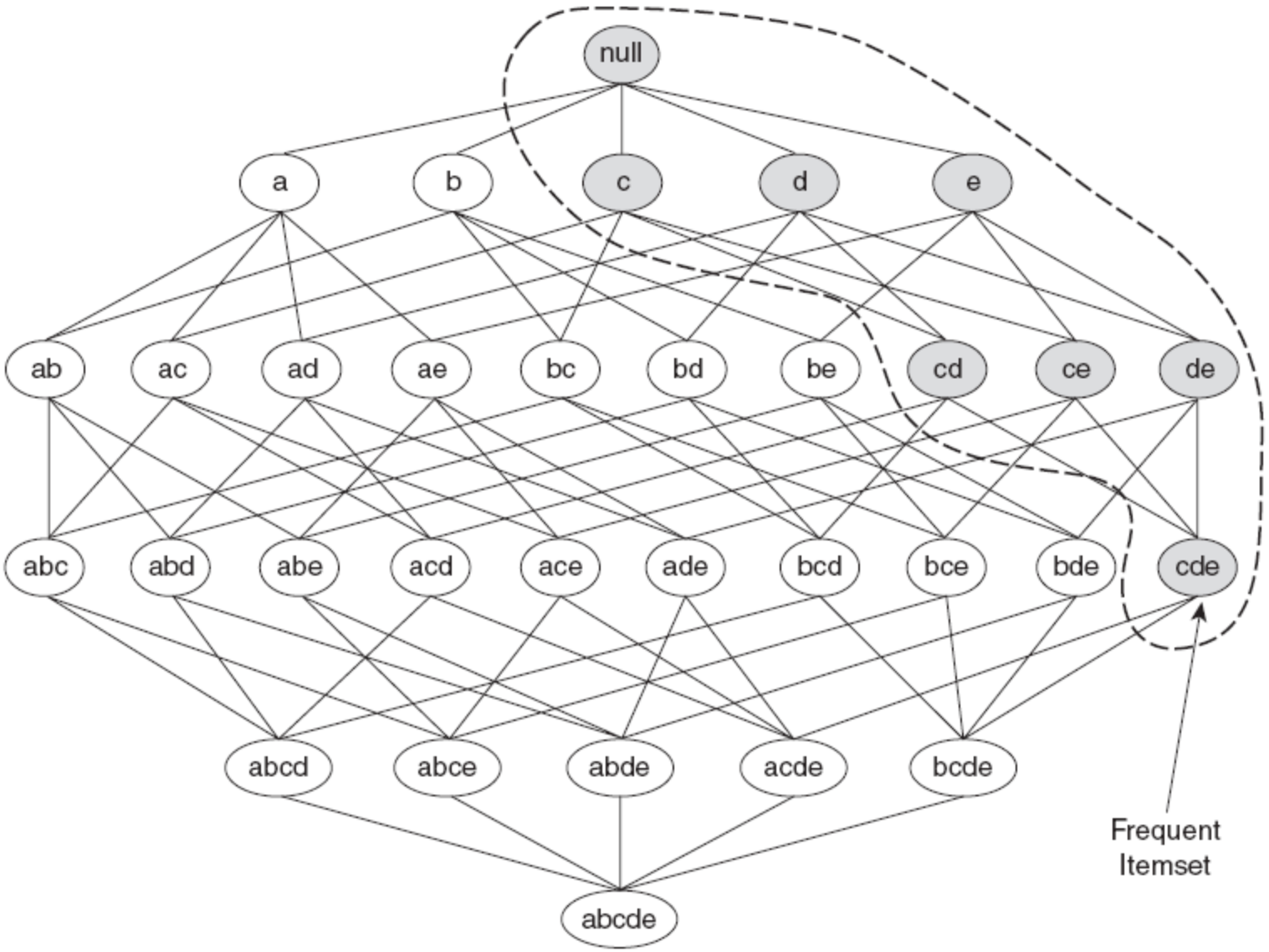
Frequent Itemset Generation



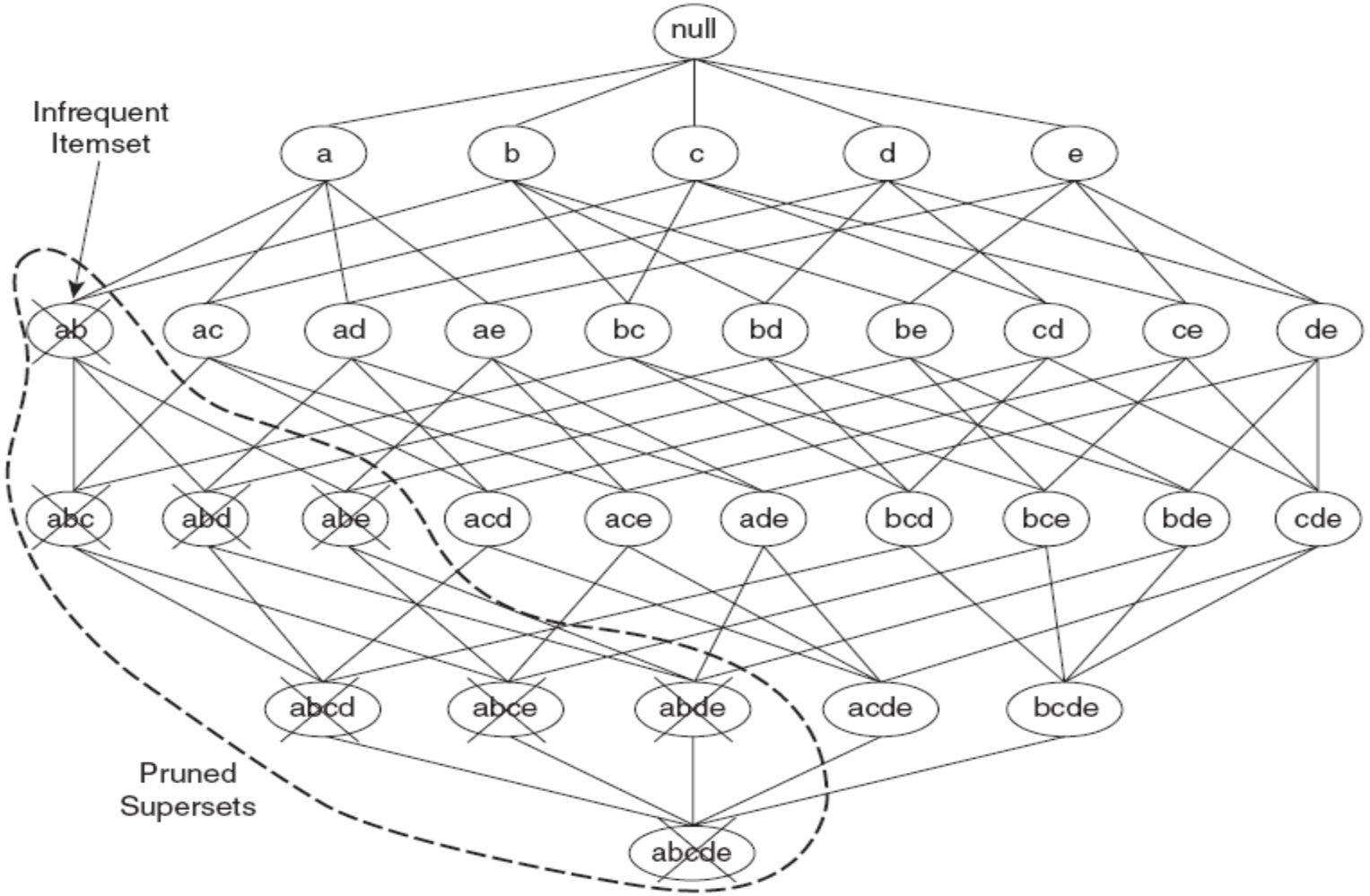
Counting the support of candidate itemsets.



An itemset lattice.



An illustration of the *Apriori* principle.



anti-monotone property

$$\forall X, Y \in J: \ (X \subseteq Y) \longrightarrow f(Y) \leq f(X),$$

SUPPORT-The measure of how often the collection of items in an association occur together as a percentage of all the transactions.

$$\text{Support, } s(X \longrightarrow Y) \quad = \quad \frac{\sigma(X \cup Y)}{N};$$

CONFIDENCE-Confidence of rule "B given A" is a measure of how much more likely it is that B occurs when A has occurred. Statisticians refer to this as the conditional probability of B given A.

$$\text{Confidence, } c(X \longrightarrow Y) \quad = \quad \frac{\sigma(X \cup Y)}{\sigma(X)}.$$

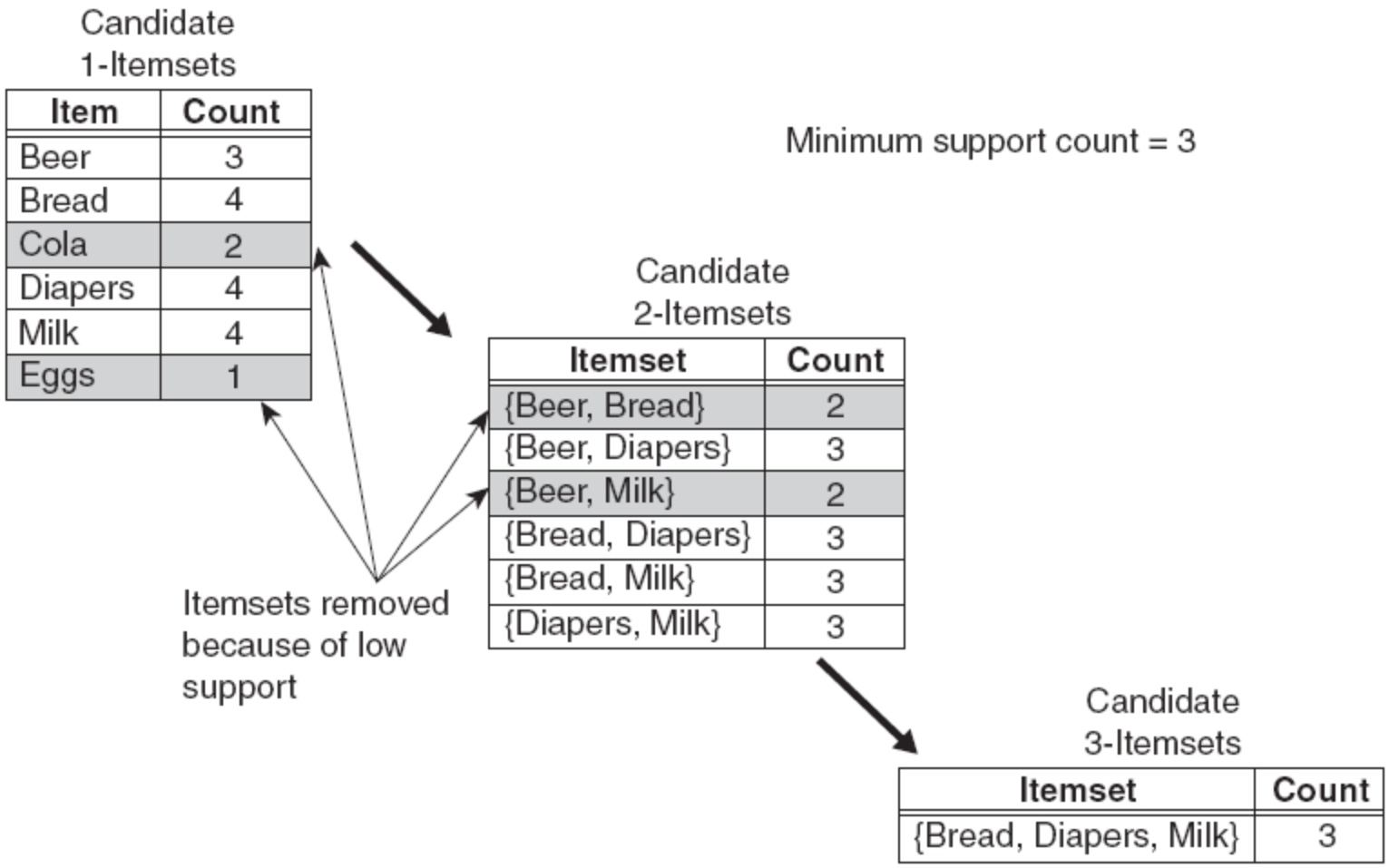
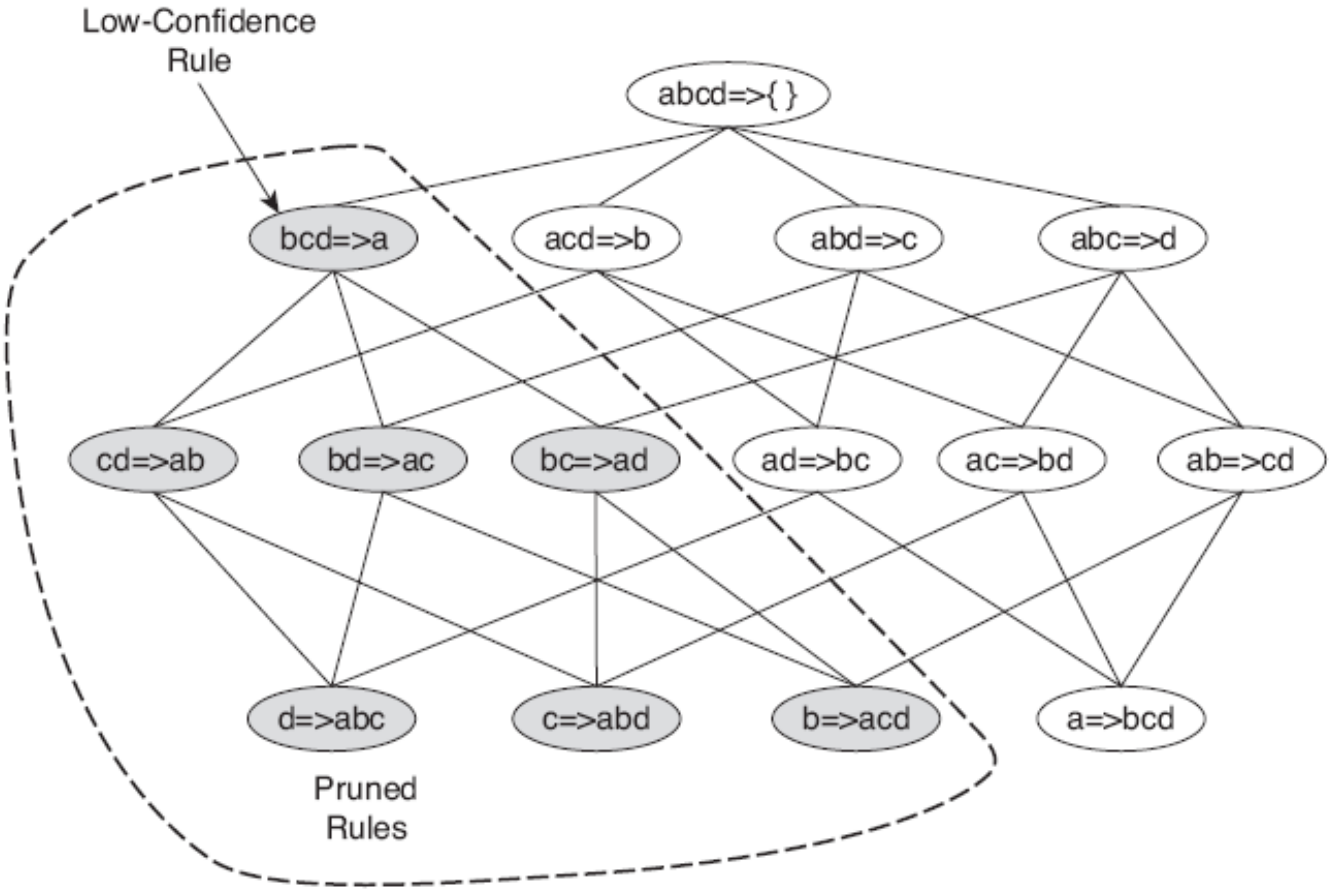


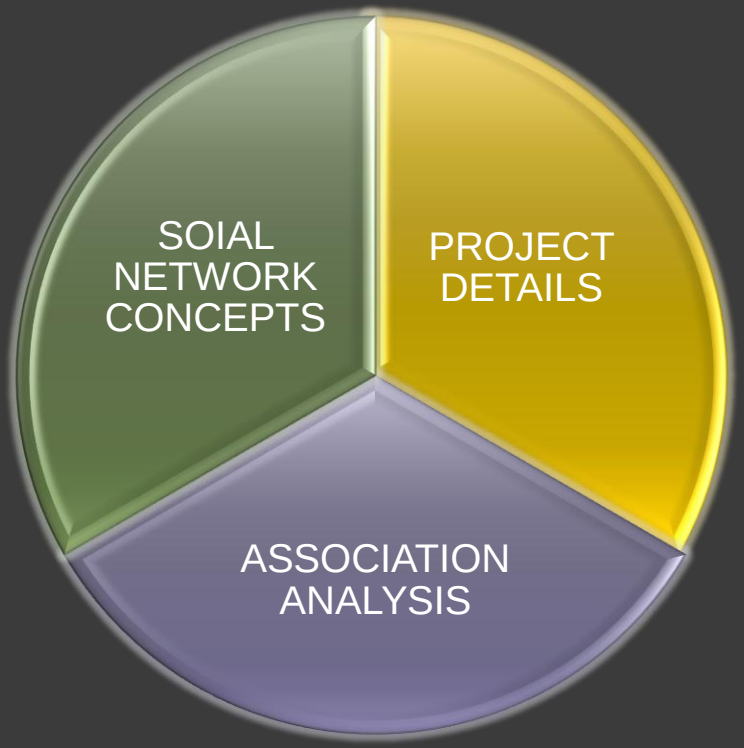
Illustration of frequent itemset generation using the *Apriori* algorithm.

Rule Generation

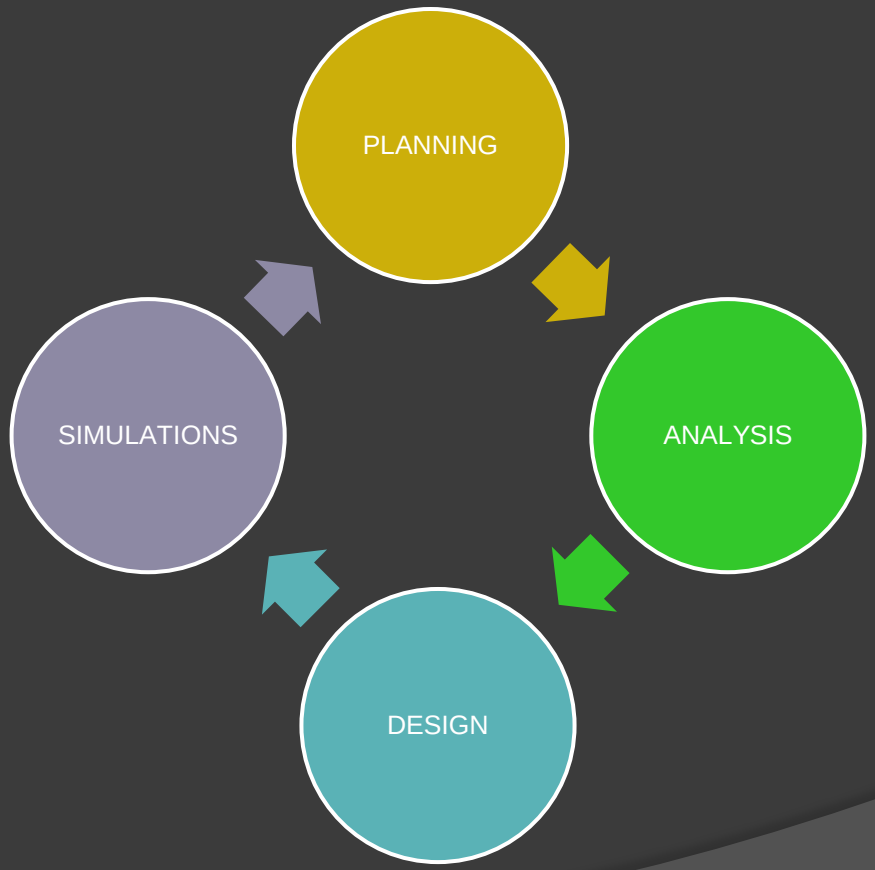


Pruning of association rules using the confidence measure.

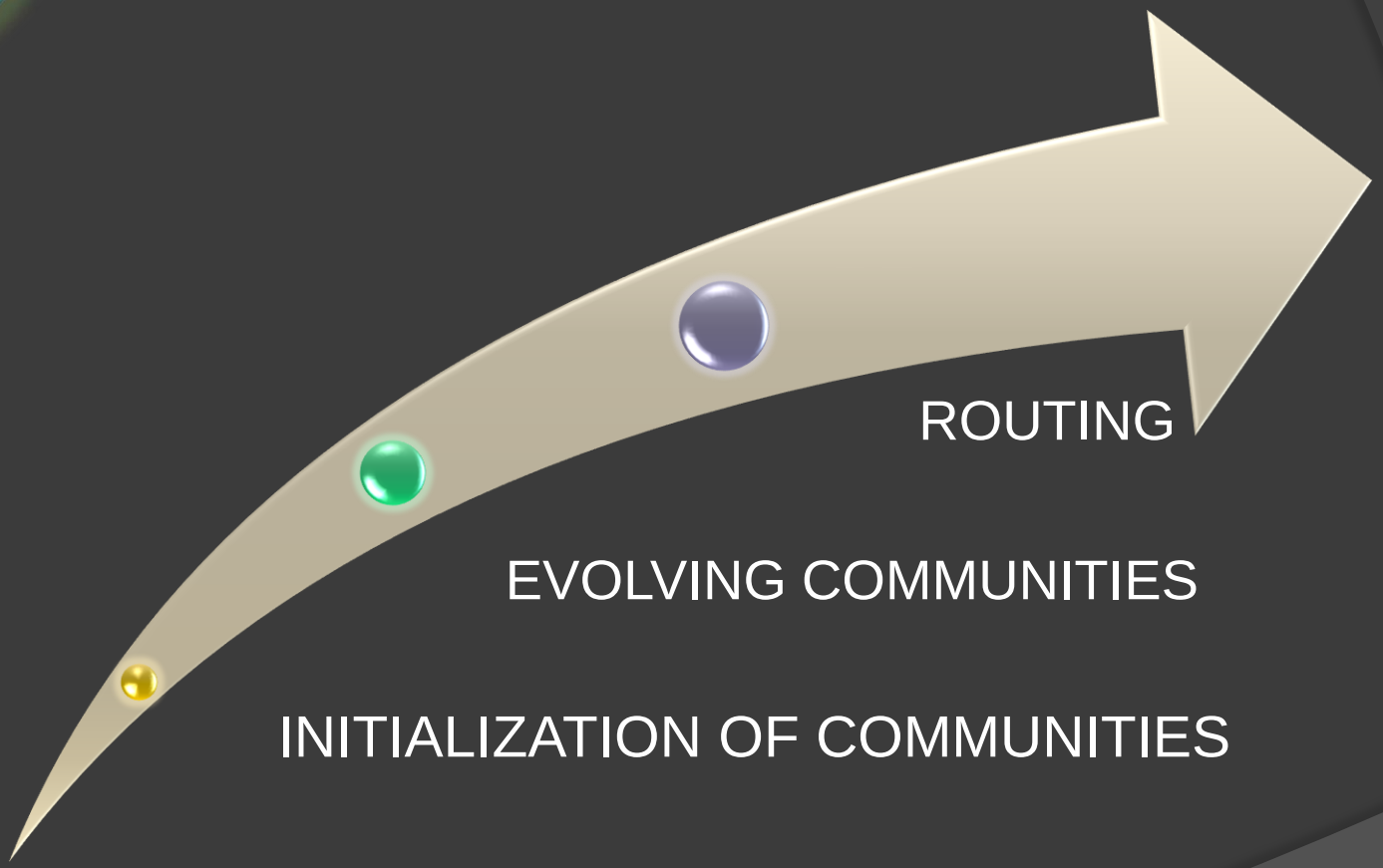
PRESENTATION PIE



PROJECT WORKFLOW



DESIGN

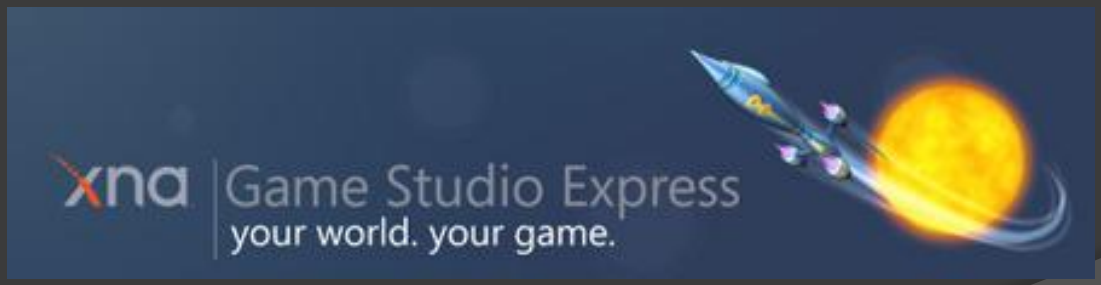

ROUTING
EVOLVING COMMUNITIES
INITIALIZATION OF COMMUNITIES


NODE
1


NODE
2


SIMULATIONS


Java


xna
Game Studio Express
your world. your game.