Discrete Mathematics on our daily lives

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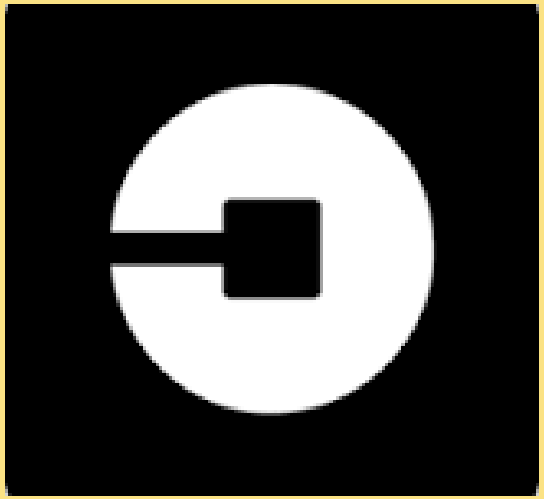
Discrete Mathematics

- branch of mathematics that deals with distinct or separate values

- It involves the study of mathematical structures and objects that are fundamentally discrete in nature.

•Focuses on smooth and connected concepts like calculus, discrete mathematics deals with countable and distinct elements.

Maps

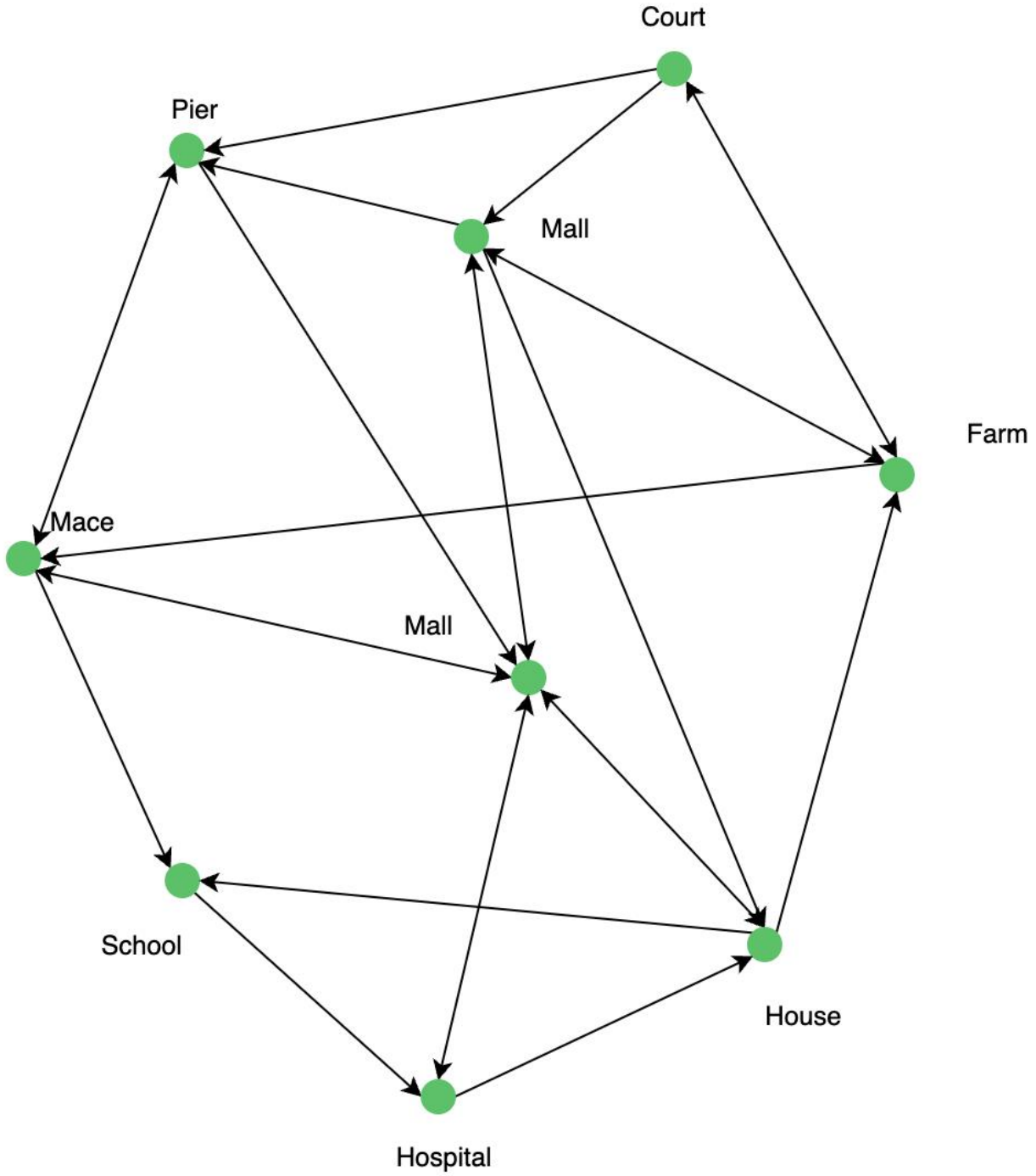


Discrete mathematics on Maps

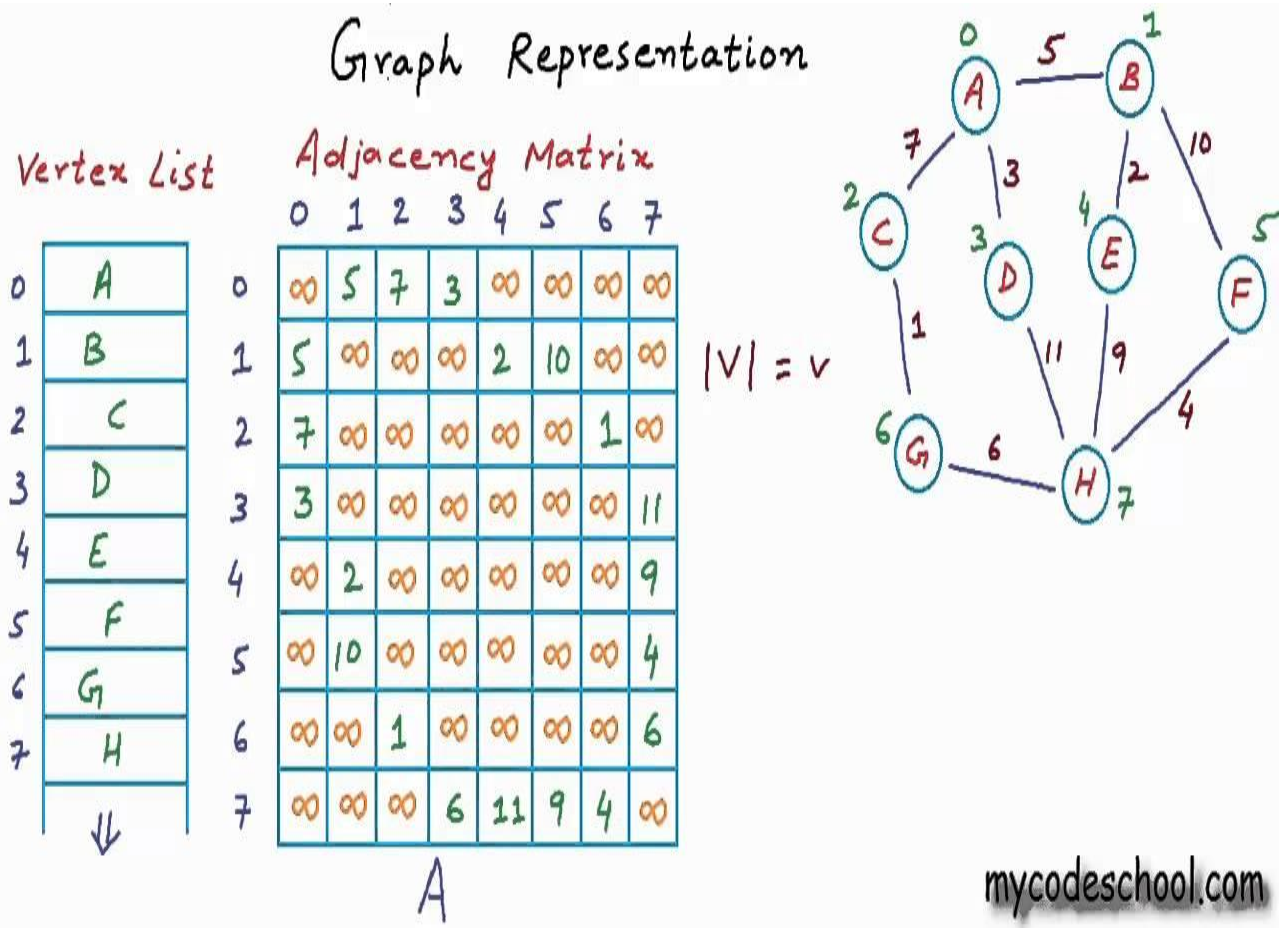
- Graph theory – the study of graphs, which are mathematical structures used to model pairwise relations between objects.

Legend:

- ⟶ Show that the street goes 1-way
- ⟷ Show that the street goes 1-way



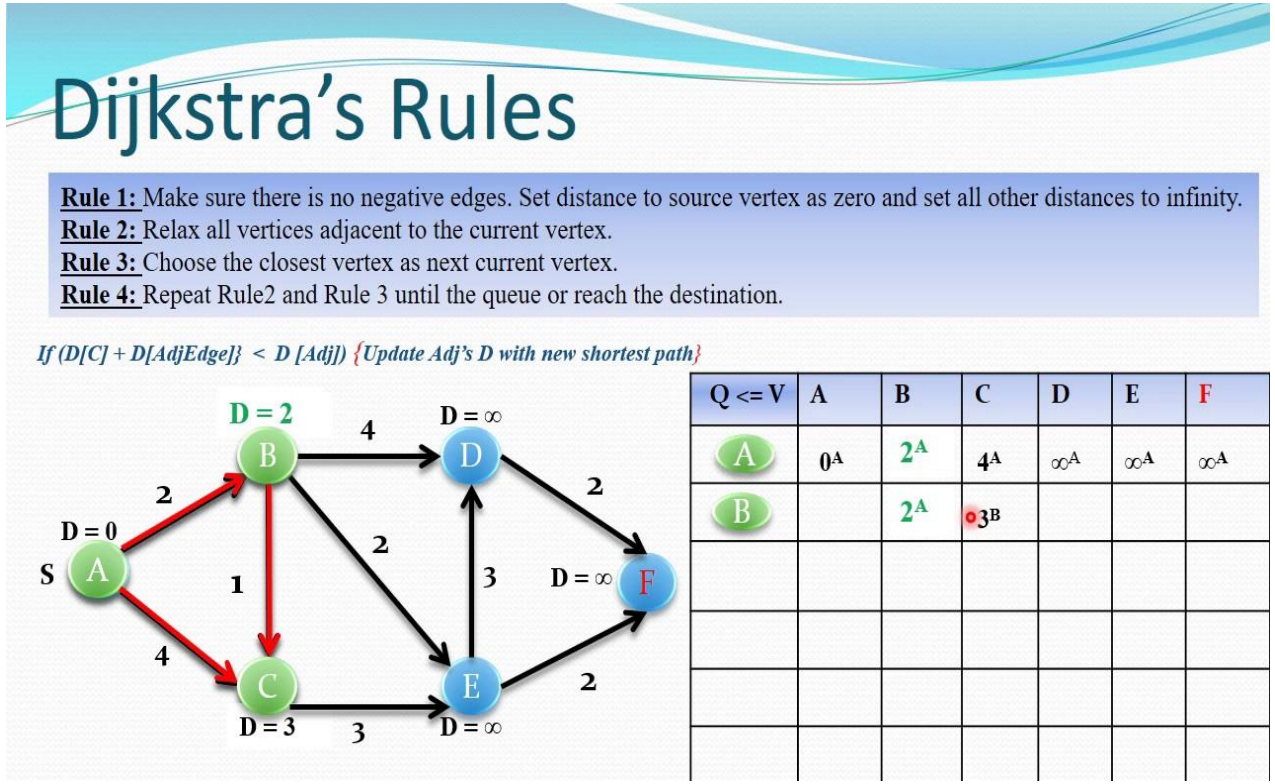
Adjacency Matrices



- An adjacency matrix is a square matrix used to represent a finite graph. In the context of graph theory, a graph is a collection of nodes (vertices) and edges connecting these nodes.
- The elements of the matrix represent whether pairs of vertices are adjacent or not. If there is an edge between vertices i and j, then the element in the i row and j column is set to 1; otherwise, it is 0.
- For an undirected graph, the adjacency matrix is symmetric since the edge between vertices i and j is the same as the edge between vertices j and i.

Dijkstra’s algorithm

- Dijkstra's algorithm is a greedy algorithm that always selects the node with the smallest tentative distance from the source at each step. This local optimization results in finding the globally optimal solution for the shortest paths.
- It is designed to find the shortest paths from a single source node to all other nodes in a weighted graph. The algorithm maintains and continuously updates the shortest known distance from the source to each node as it progresses.



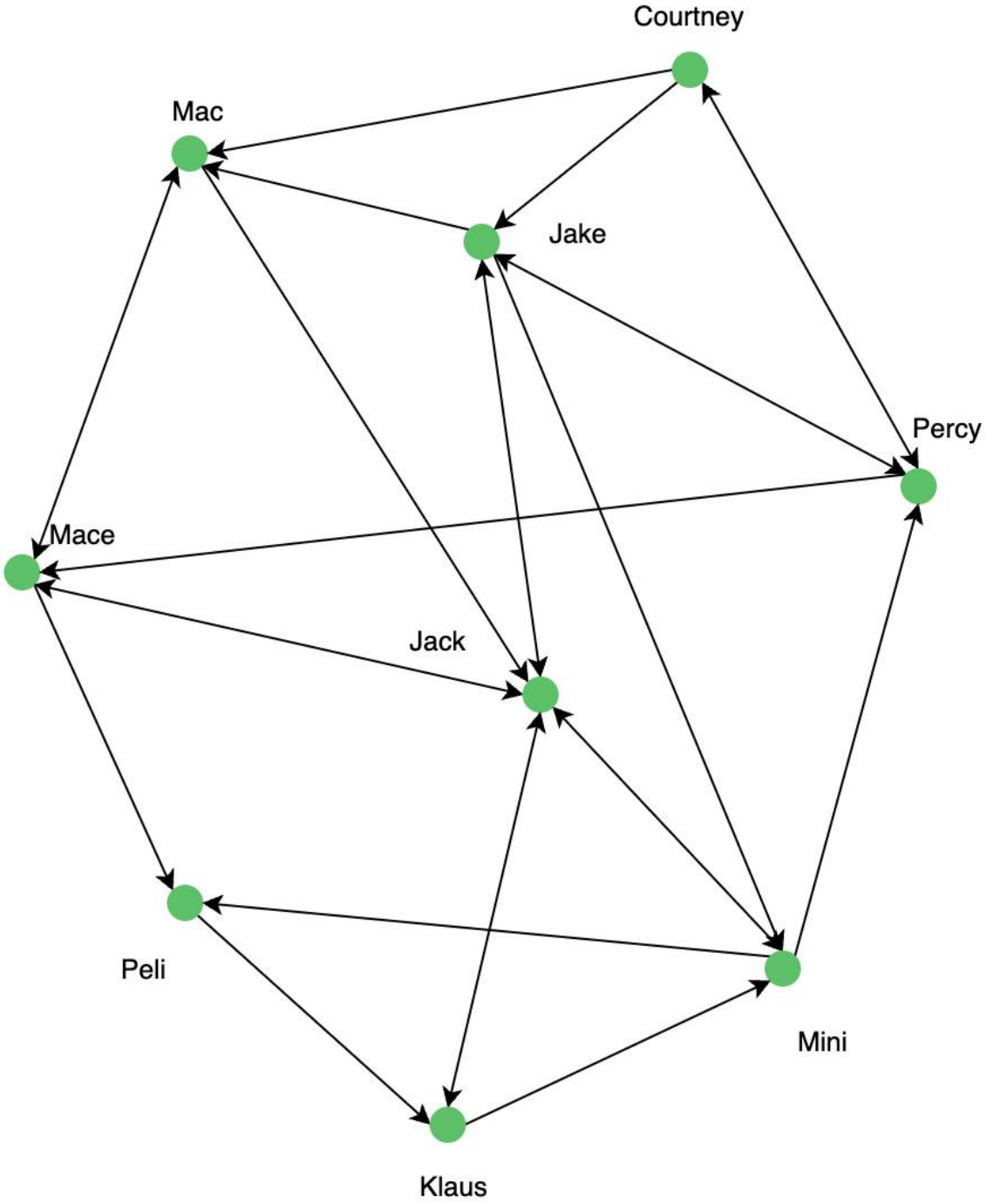
SOCIAL MEDIA

Discrete mathematics on Social Media

- Graph theory – the study of graphs, which are mathematical structures used to model pairwise relations between objects.

Legend:

- ⟶ Show that the street goes 1-way
- ⟷ Show that the street goes 1-way



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•Facebook News Feed Algorithm: Facebook uses a complex algorithm that considers factors such as user engagement, post popularity, relevance, and the recency of posts to determine the content displayed in a user's News Feed.

•Instagram Feed Algorithm: Instagram's algorithm takes into account factors like user engagement, post recency, and user interests to curate the content displayed in the feed. It also includes features like chronological sorting and algorithmic suggestions.

•Twitter Timeline Algorithm: Twitter's algorithm considers engagement metrics, tweet popularity, and relevance to users to display tweets in a non-chronological order. Users can switch between a chronological and algorithmic timeline.

Thank you