

### Definition of Graph

Graphs are non-linear data structures made up of two major components:

Vertices: are entities in a graph

Edges: represent the relationship between the vertices in the graph

Graph's Goal

Used to visualize organized data and to represent places and the distance between them.

Types of Graphs:

Based on Direction:

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Undirected Graphs:  $\text{edge}(x,y) == \text{edge}(y,x)$

Directed Graphs:  $\text{edge}(x,y) \neq \text{edge}(y,x)$

### Data Structure(Graph)

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Based on Weights: Weighted Graphs: every edge has a value

Unweighted Graphs: does not have a value associated with every edge.

Special Graphs: Trees, Directed Acyclic Graphs, Complete Graphs

Implementation:

Graphs are easily built out of lists and dictionaries as in figure(1).

This graph has six nodes (A-F) and eight edges as in figure(2).



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