

Data Structure(Graph)

Graph's Definition: Graphs are non-linear data structures made up of two major components

Graph's Components: 1.Vertices: are entities in a graph
2.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: 1.Based on Direction: Undirected Graphs: $edge(x,y) == edge(y,x)$ Directed Graphs: $edge(x,y) != edge(y,x)$
2.Based on Weights: Weighted Graphs: every edge has a value Unweighted Graphs: does not have a value associated with every edge.
3.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).

figure(1)

```
graph = {'A': ['B', 'C'],
        'B': ['C', 'D'],
        'C': ['D'],
        'D': ['C'],
        'E': ['F'],
        'F': ['C']}
```

figure(2)

```
A -> B
A -> C
B -> C
B -> D
C -> D
D -> C
E -> F
F -> C
```



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Page 2 of 2.

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